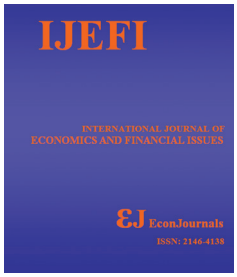

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Military Expenditure and Economic Growth in South Asian Countries: Empirical Evidences

Saba Ismail*

Department of Economics, Jamia Millia Islamia (Central University), New Delhi - 110 025, India. *Email: sismail@jmi.ac.in

ABSTRACT

This paper is an attempt to examine the relationship between military expenditure and economic growth in South Asia region. Panel fixed effect model has been estimated using panel data from five South Asian Countries. The results indicate positive effect of military expenditure on economic growth but significantly less compared to alternative uses of scare resources as non-military expenditure. This study raises an important issue of huge opportunity cost of military expenditure and foregone opportunity of economic growth. The paper concludes that the boosting of economic growth through higher military expenditure is neither effective nor efficient way of achieving higher growth.

Keywords: Military Expenditure, Economic Growth, Panel Data, South Asia
JEL Classifications: H5, O41, O47

1. INTRODUCTION

A significant portion of economic resources are incurred on military spending on the basis of perceived threat perception of political elites of nation states. It is argued and justified usually in terms of the need to maintain national security, law and order and to combat internal disturbances, etc. As per Stockholm International Peace Research Institute (SIPRI) estimates 2013, the global military expenditure in 2013 was US $1747 billion, around 2.4% of world gross domestic product (GDP). Given the widespread poverty, illiteracy and malnutrition in poor countries, it seems illogical diverting scarce resources towards military expenditure at the cost of unattended basic human needs. Ever increasing size of military expenditure along with vested interests of arms industry on one side and poor development outcomes of the economy on the other side have led to renewed debate over whether the increase of the military expenditure enhances or deteriorates economic growth and welfare.

South Asia region (SAR) has alarming proportion of poor and malnourished population in the world. In the year 2011, 24.5% and 60.2% of the people of SAR are living a life on less than $1.25 a day (PPP) and $2 a day (PPP) respectively (World Bank, 2015). These are amongst the highest rates of deprivation in the world and new threats are emerging which are expected to intensify the situation. According to FAO, poverty figures and statistics generally underestimate the true extent of food insecurity, which includes hidden hunger: Micronutrient deficiencies that are beyond calories, limit potential for active and healthy lives (World Bank, 2014). Analysing country wise poverty figures for SAR, Bangladesh, Nepal and India are the most affected countries by poverty and hunger, followed by Pakistan, Sri Lanka, Bhutan and Maldives (Table 1).

Despite widespread poverty and malnutrition, border disputes and tensions in SAR are pandemic and persistent. For example, India has border disputes with China and Pakistan. China's growing assertiveness in its territorial claims along side of McMahon Line, especially on Arunachal Pradesh, and its relentless development of infrastructure in Tibet have affected the India-China relations. The border line between India and Pakistan has been the site of numerous skirmishes since partition in 1947. Both countries have fought three wars over Kashmir and numerous smaller conflicts have arisen on frequent basis. There are unsettled border and water disputes of India with Bangladesh and Nepal. These disputes are

basically on border issues arisen out of partition and colonial historical background of SAR.

Other than border issues among SAR, there are various internal problems such as militancy, ethnic conflicts in the region, insurgency, poor governance, etc. Looking at the fatalities in terrorist violence in SAR in Table 2, threat perception is based on ground realities. Fatalities in terrorist activities in the region are one of the indications of prevailing serious internal threats in these countries. During 2005-2014, SAR has lost 1, 13,480 people in terrorism related violence, out of these 40,605 people were civilians and remaining were either security personnel or terrorists involved. Out of all, India and Pakistan are the worst affected nations in last 5 years.

Border disputes along with internal conflicts are leading to stressful diplomatic relations among neighbouring countries in South Asia. For instance, India blames China, Pakistan or Nepal for insurgency or terrorist activities in Jammu and Kashmir, eastern India and north east India. Similarly, Pakistan blames India for terrorist activities in Pakistan. Sri Lanka also blames India for supporting Tamils in Sri Lanka. Similarly, Bangladesh blames ISI of Pakistan for many internal disturbances. Blame games on each other has created trust deficit in the region and resulted in an increase in the military expenditure in almost all countries in SAR. Table 3 depicts military expenditure by country as percentage of GDP during the period of 1988-2013. It reveals that Pakistan has spent highest proportion of GDP on military expenditure followed by Sri Lanka and India during the period of 1988-2013. In terms of military expenditure per capita by country, Sri Lanka leads in SAR by spending US$ 87.6 in 2013, followed by Pakistan, India, Bangladesh and Nepal (SIPRI, 2014).

Table 1: Poverty headcount ratio a day (PPP) (% of population)

Country	Year	$1.25 a day (PPP)	$2 a day (PPP)
Bangladesh	2010	43.3	76.5
Nepal	2010	23.7	56
India	2012	23.6	59.2
Pakistan	2011	12.7	50.7
Sri Lanka	2010	4.1	23.9
Bhutan	2011	2.4	15.2
Maldives	2004	1.5	12.2

Source: World Bank, Poverty and Inequality Database and PovcalNet (Last accessed on 21 February, 2015 at http://povertydata.worldbank.org/poverty/region/SAS)

Military expenditure to GDP ratio versus annual GDP growth has been presented in Figure 1 for graphical analysis. It is difficult to draw explicit inference about links between GDP growth rates and military expenditure as a proportion of GDP in number of countries in SAR. For Bangladesh, during 1988-93, growth rates (GDPBG) and military expenditure as a proportion of GDP (MEBGDP) seems to be correlated but such trend is not visible during 1994-2008. In this period, GDPBG is showing upward trend despite MEBGDP is falling. However, co-movement seems to be re-emerging since 2009. In case of India, MEIGDP and GDPIG co-movements could be observed. In case of Nepal, MENGDP and GDPNG are not showing any visible pattern. There is a sudden increase in MENGDP during 2000 to 2006 as a result of internal disturbances and instability in Nepal but such trend of growth rates could not be observed. Looking at trends for Pakistan, it explicitly reveals that there is no link between GDPPG and MEPGDP. Military expenditure as proportion of GDP is consistently falling but no such trend is visible for GDP growth rates. Pattern of MESGDP and GDPSG seems to be mixed. Figure 1 reflects all probable trends and relationship between military expenditure and GDP growth rates.

Despite scarcity of resources in SAR, a significant proportion of budget is diverted towards military expenditure on grounds of internal security and external threat perceptions. This is an area of investigation for researchers as it may have serious implications to growth rate of output, employment, poverty and malnourishment of underprivileged section of the society. Remaining paper is organized in following sections. Section 2 presents review of selected literature. Data and Methodology for analysis is discussed in Section 3. Section 4 discusses empirical results. Concluding remarks are summarized in Section 5.

2. REVIEW OF SELECTED LITERATURE

The relationship between economic growth and military expenditure became popular following the pioneer work by Benoit (1973; 1978), which suggested that military spending has a positive impact on economic growth. Later, many researchers examined the linkages between economic growth and military expenditure. Theoretically as well as empirically, causal linkages between military expenditure and economic growth have not been established, so far, explicitly. Mostly, empirical results are mixed

Table 2: Fatalities in terrorist violence

Country	Pakistan		Sri Lanka		Bangladesh		India		Nepal		South Asia	
Year	C	Total	C	Total	C	Total	C	Total	C	Total	C	Total
2005	430	648	153	330	37	212	1212	3259	231	1845	2063	6294
2006	608	1471	981	4126	34	184	1118	2770	61	480	2803	9032
2007	1522	3598	525	4377	9	88	1013	2615	59	99	3128	10777
2008	2155	6715	404	11144	4	58	1030	2619	55	81	3653	20627
2009	2324	11704	11111	15565	6	87	721	2232	35	50	14197	29638
2010	1796	7435	0	0	4	56	759	1902	12	38	2571	9431
2011	2738	6303	0	0	0	24	429	1073	7	19	3173	7419
2012	3007	6211	0	0	1	18	252	803	10	11	3270	7043
2013	3001	5379	0	0	232	404	304	885	0	0	3537	6668
2014	1781	5496	0	3	29	36	407	976	0	0	2210	6551
Total	19362	54960	13174	35545	356	1167	7245	19134	470	2623	40605	113480

C: Civilians; Source: http://www.satp.org/

Figure 1: Military expenditure to gross domestic product (GDP) ratio versus annual GDP growth (1988-2013). (a) MEBGDP: Military expenditure to GDP ratio of Bangladesh; GDPBG: GDP growth rates of Bangladesh; (b) MEBGDP: Military expenditure to GDP ratio of India; GDPBG: GDP growth rates of India; (c) MEBGDP: Military expenditure to GDP ratio of Nepal; GDPBG: GDP growth rates of Nepal; (d) MEBGDP: Military expenditure to GDP ratio of Pakistan; GDPBG: GDP growth rates of Pakistan; (e) MEBGDP: Military expenditure to GDP ratio of Sri Lanka; GDPBG: GDP growth rates of Sri Lanka

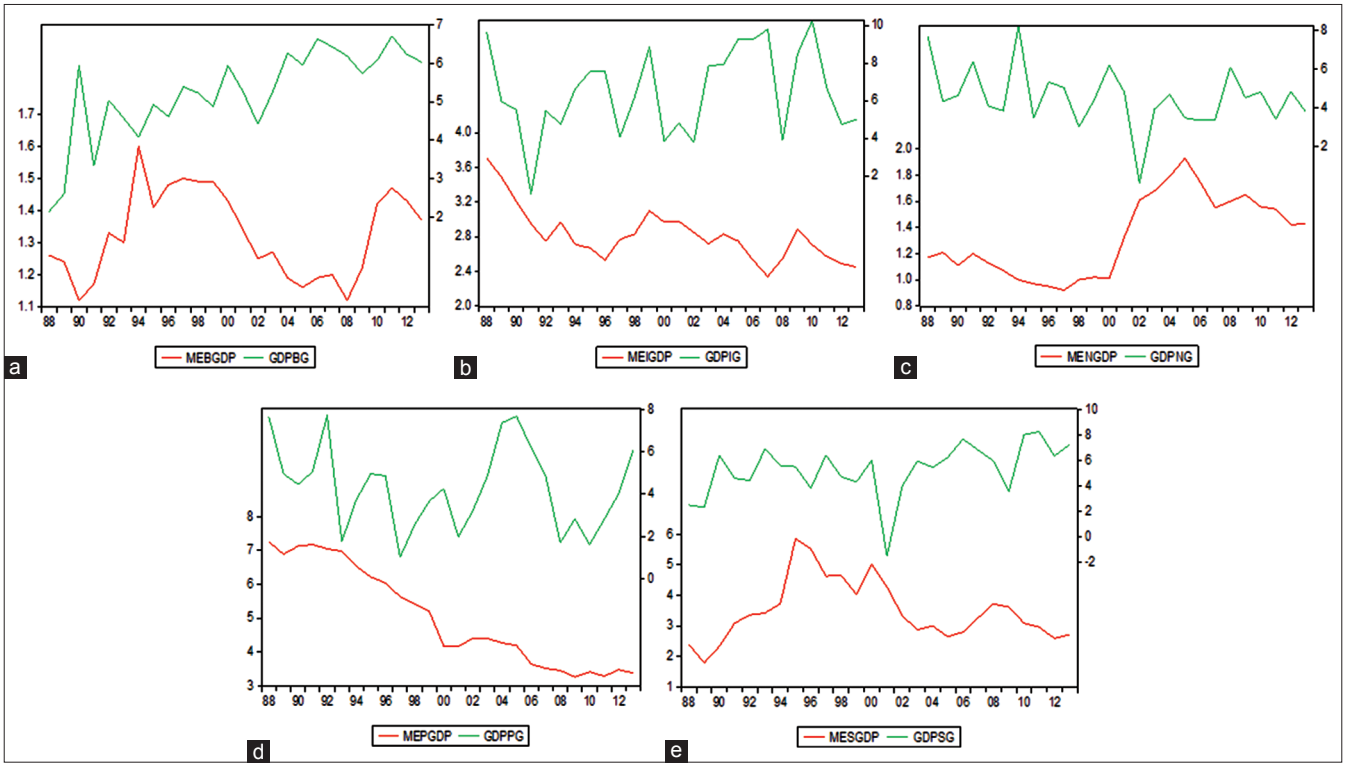

Table 3: Military expenditure as a percentage of gross domestic products 1988-2013

Year	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1988	1	3.6	0.9	6.4	2.4
1995	1.3	2.7	0.8	5.5	5.9
2000	1.3	3.1	0.8	3.8	5
2005	1	2.8	1.7	3.6	2.6
2010	1.2	2.7	1.4	2.8	3.1
2011	1.3	2.6	1.4	2.9	3
2012	1.3	2.5	1.3	3	2.6
2013	1.2	2.5	1.3	3	2.8

Source: SIPRI data at http://www.sipri.org/research/armaments/milex

and hence it is difficult to argue convincingly about the extent and direction of relationship. One of the reasons is the heterogeneity in the approaches of estimation and variation in sample sizes of data used in drawing inferences about linkages between military expenditure and economic growth (Dunne et al., 2005).

On the basis of review of existing literature, positive, negative or no linkages could exist between military expenditure and GDP growth. Many scholars (e.g., Ram, 1995; Fredericksen and Looney, 1982; Weede, 1986; Stewart, 1991; Ward et al., 1991; Mueller and Atesoglu, 1993; Murdoch et al., 1997; Shieh et al., 2002; Yildirim et al., 2005; Aizenman and Glick, 2006) argue that military expenditure speed up economic growth through its expansionary effect on aggregate demand and resultant Keynesian effects on output and employment, expansion of markets for suppliers, improved and enhanced infrastructure, innovation and technology development, more skilled workforce and stability and security in the nation. The positive externalities of spill-over effects of military expenditure in research and development (R&D) in the military industries are expected to benefit the general economic growth in an economy. For example, the development of military infrastructure (highway, airport, road and information technology) leads to higher economic growth. Definitely, defence spending provides protection to the citizens by maintaining internal and external security, thus creating positive trade and investment climate for domestic as well as foreign investors.

There are a number of studies showing negative relationship between military expenditure and economic growth (e.g., Smith, 1980; Deger and Sen, 1983; Deger and Smith, 1983; Faini et al., 1984; Cappelen et al., 1984; Deger, 1986; Chowdhury, 1991; Batchelor et al., 2000; Dunne et al., 2001, Yang et al., 2011; Chang et al., 2011; Chang et al., 2014). Some of them argued that an increase in military expenditure can thwart economic growth by using resources for consumption which does not enhance productive capacity of an economy. There are research on the subject indicating towards trade-off hypothesis between military expenditures and alternative productive investments such as diverting of scarce resources from domestic capital formation, education, health, infrastructure, etc. which are expected to be more growth oriented. It has also been argued that military expenses may cause balance of payments problems and inflationary pressures on the economy which might retard growth.

Higher taxation is imposed to finance higher military spending which, in long run, may depress growth prospects.

Many researchers have revealed evidences of mixed relationship or non-existent relationship between military expenditure and GDP growth (e.g., Biswas and Ram, 1986; Alexander, 1990; Huang and Mintz, 1990; Adams et al., 1991; Huang and Mintz, 1991; Payne and Ross, 1992; Kollias and Makrydakis, 1997; Chowdhury, 1991; Dakurah et al., 2001; Gerace, 2002; Lai et al., 2002; Kollias et al., 2004; Pieroni, 2009; Dunne, 2011; Aye et al., 2014). The studies mentioned above suggest that the impact of military expenditure on GDP growth is ambiguous and the concept of crowding out private investments is not very clear. Aizenman and Glick (2006) suggest that military expenditure may be growth enhancing or growth depressing depending upon on its nature of spending. There are a few studies which reveal positive effect of military spending on economic growth but argue that military expenditure is a sub-optimal way of economic stimulation due to the greater positive impact of non-military spending on economic growth. These studies include Batchelor et al. (2000), Shieh et al. (2002) and Ahmed and Ismail (2015) among others.

In SAR, some of the studies try to assess the impact of defence expenditure on economic growth (e.g., Hassan et al., 2003; Yildirim, and Öcal, 2006; Wijeweera and Webb, 2011; Ahmad and Ahmed, 2014). Hassan et al. (2003) investigated the relationship between defence expenditure and economic growth and FDI for the period 1980-1999 and found a positive relationship between defence expenditure and economic growth. Yildirim, and Öcal (2006) investigated the impact of defence spending on two South Asian countries, Pakistan and India, and found that there is no evidence of military expenditure causing growth in Pakistan but there is a causality running from military expenditures to economic growth in India. Wijeweera and Webb, 2011 study used a panel co-integration for five South Asian countries of India, Pakistan, Nepal, Sri Lanka and Bangladesh over the period of 1988-2007. They found that military spending in these countries has a negligible impact upon economic growth. Ahmad and Ahmed (2014) found that defence spending is not contributing to economic growth compared to alternative expenditures such as health care expenditures and research contribution.

Till date, the debate about causal linkages and its direction between military expenditure and economic growth is still unresolved and there is neither theoretical consensus nor conclusive empirical evidence about this relationship. Given the dire need of appropriate use of scarce resources in light of widespread poverty and malnutrition in the SAR, the present study has made an attempt to examine the effects of bulging military spending upon economic growth in SAR. The findings of this study will be an addition to the existing literature on the subject.

3. DATA AND METHODOLOGY

To undertake empirical analysis, the present study has used data for five South Asian countries from 1988 to 2013. The data on GDP at constant prices, gross fixed capital formation (GFCF) and trade to GDP ratio have been drawn from World Development Indicators series by the World Bank (2014). Military expenditure statistics have been drawn from SIPRI (2014).

Panel approach is expected to deal better with the problem of measurement bias and the issues related to limited degrees of freedom. As our data series consist of 5 cross section units and 26 years of time dimension, it is more suitable to apply panel estimation methods. In panel framework, the long-run relationship between military spending and real GDP may be expressed as:

$$Log(Y_{it})=\alpha+\beta_1 Log(X_{it})+\beta_j log(Z_{itj})+\varepsilon_{it} \quad \text{For } i=1,2,\ldots,N;\ t=1,2\ldots,T \text{ and } j=1,2,3 \tag{1}$$

Where Y_{it} is gross domestic product (GDP) at time t of i^{th} country, X_{it} is military expenditure (ME) at time t of i^{th} country, and Z_{itj} reflects other variables such as gross fixed capital formation (GFCF) and trade to GDP ratio (TRGDP) and lagged values of military expenditure at time t of i^{th} country and ε_{it} is a disturbance term at time t.

Before using the data for estimation, the panel unit root tests are conducted to check the stationarity of the panel and the order of integration to avoid spurious results. For robustness, the study has applied four panel unit root tests as proposed by Levin et al. (2002), Im et al. (2003) and Maddala and Wu (1999) using Eviews software.

If data series is non-stationary, it is advised to transform non-stationary series into stationary series by appropriate differencing before empirical estimation. But, economic theory is mostly expressed in levels rather than change in levels, so it might not be suitable for modelling economic behaviour. To use the information in levels, panel co-integration tests are used which reveal long-run equilibrium relationship even in non-stationary series if they are integrated of same order and co integrated as well (Engle and Granger, 1987).

In this study, Kao (1999) panel co-integration test has been applied under the null hypothesis of no cointegration, the residual series e_{it} should be non-stationary. The model has varying intercepts across the cross-sections (the fixed effects specification) and common slopes across *i.* Kao (1999) uses both DF and ADF to test for cointegation in panel which starts with the panel regression model as set out in equation 1 where Y and X are presumed to be non-stationary and:

$$\hat{\varepsilon}_{it} = \rho\hat{\varepsilon}_{it-1} + v_{it} \tag{2}$$

where $\hat{\varepsilon}_{it} = Log(Y_{it}) - \hat{\alpha} - \hat{\beta}_1 Log(X_{it}) - \hat{\beta}_2 \log(Z_{it})$ are the residuals from estimating Equation 1. To test the null hypothesis of no co-integration amounts to test H_0: $\rho = 1$ in Equation 2 against the alternative that Y and X are co-integrated (i, e., H_1: $\rho < 1$). Kao constructed a bias-corrected serial correlation coefficient estimate and, consequently, the bias-corrected test statistics to test for co-integration.

An alternative approach was proposed by Maddala and Wu (1999) and Choi (2001) independently against the heterogonous

alternative similar to IPS that is based on the P values of the individual statistics. Considering the P values from an individual co-integration test for cross-section, combined P values under the null hypothesis for the panel is $-2\sum_{I=1}^{N} Log(\pi_i) \rightarrow \chi^2$. EViews reports the χ^2 value based on MacKinnon-Haug-Michelis (1999) *P* values for Johansen's co-integration trace test and maximum eigenvalue test.

After testing for stationarity and co-integration of data series, Hausman specification test is applied to choose appropriate panel model for estimation from a fixed effect or random effect models. The Hausman test statistic follows Chi-square distribution with *k* degrees of freedom, where *k* is the number of slope parameters in the model. If the P value of Chi-square statistics is less than 0.05, then we reject the null and conclude that the fixed effects model is the appropriate choice for panel estimations.

Finally, it is pertinent to identify serial correlation in the error term in a panel-data model as it biases the standard errors and causes the results to be less efficient. A test statistics for the detection of serial correlation in random or fixed-effects models was derived by Wooldridge (2002). This test can be applied under general conditions and is easy to implement in STATA (Drukker, 2003). The most common way of remedy is to assume that the disturbances for each cross-section unit over time follow an AR(1) process. Hence, fixed effects (within) model or random effects with AR(1) disturbances has been recommended in such scenario.

4. EMPIRICAL RESULTS

The descriptive statistics (DS) of five South Asian countries for the period ranging from 1988 to 2013 are given in Table 4. The data pertaining to DS depicts that Nepal is the smallest economy and India is largest economy of SAR as per size of GDP. On an average, India's GDP size is 101 times of Nepal, while, Pakistan's GDP is 13 times that of Nepal. Similarly, India's GFCF size is 113 times of Nepal while Pakistan's GFCF is 10 times of Nepal. This shows inequality in economic strength across countries in SAR. Again, in terms of military expenditure also, India's ME is 190 times of Nepal, 32 times of Bangladesh and 24 times of Sri Lanka and 5 times of Pakistan, approximately. Looking at trade openness of south Asian countries, out of 100, trade to GDP ratio of Bangladesh is 33, of India is 23.50, of Nepal is 35.6, of Pakistan 31.6 and of Sri Lanka is 60. India is least integrated with global economy in the region. In all variables, the values of standard deviation indicate widespread inequalities among nations.

The precondition for empirical analysis on time series or panel data series is the stationarity of data so as to avoid spurious results. In view of this, the panel unit root tests are applied on the data and all four data series, i.e., GDP, ME, GFCF and TRGDP are transformed by taking natural logarithms to correct for heterogeneity bias. Transformed series are then tested for stationary using LLC test, IPS test, ADF–FC test and PP–FC test. Invariant to the test applied all the four unit data series are found to be non-stationary in levels and stationary in first differences. The results are presented in Table 5.

As the panel unit root test results reveal that the data series is integrated of order (1), hence panel co-integration needs to be tested to determine whether panel estimation at levels is meaningful or spurious. For robustness, both Kao residual and Johansen fisher panel co-integration test are applied. The results of the tests in Table 6 clearly reject the null of no co-integration among variables, i.e., LNGDP, LNME, LNGFCF, and LNTRGDP. It implies that military expenditure and economic growth has long run equilibrium relationship. It further implies that it is possible to employ a standard panel estimation method, such as a fixed effects or random effects model, to estimate Equation (1) with the existing data series at levels.

Having established the suitability of a standard panel method to estimate the model, the fourth and final step in our analysis is to select whether fixed effects model or random effects models is appropriate to estimate from given data set. In order to determine the validity of the fixed effect model, Hausman specification test has been applied to validate our selection of the fixed effects model. Results reveal that null hypothesis has been rejected, implying that the fixed effects model is preferred over the random effects model. Further, Wooldridge Test for autocorrelation reveals presence of autocorrelation and hence fixed effects model with AR(1) specification was estimated (Table 7).

Results of Fixed effects (within) model with AR(1) disturbances are presented in Table 8. Three separate specifications of equations 1 of economic growth and military expenditure are estimated along with other control variables. Results of first specification of Equation 1 indicate that military spending exerts a positive effect upon GDP. Results indicate that 1% increase in military expenditure increases RGDP by 0.13% while 1% increases in GFCF increases RGDP by 0.42%. Results of second specification of Equation 1 reveal that 1% increase in military expenditure increases RGDP by 0.12% while 1% increases in GFCF increases RGDP by 0.40%. These results were obtained after controlling the effect of trade to GDP ratio on economic growth. Results indicate that 1% increase in military expenditure increases RGDP by 0.08% contemporaneously while 1% in lagged military expenditure results an increase in RGDP by 0.10%. Results of third specification of Equation 1 also capture lagged effect of military expenditure on economic growth as well and it shows that GFCF increases RGDP by 0.35%. Results of all equations reveal that the investment in fixed capital formation has substantial more positive effect on RGDP in comparison to military expenditure. The results of this study proposes that military spending boosts RGDP in SAR but this positive effect is negligible compared to the alternative use of scare resources as non-military expenditure. Hence, military expenditure has huge opportunity cost. The present study categorise military expenditure as a sub-optimal means of increasing economic growth. These effects are likely to have a greater positive impact (e.g., Ahmed and Ismail, 2015; Scheetz, 1991; Dunne et al., 2001; Shieh et al., 2002).

5. CONCLUDING REMARKS

The present study has made an attempt to investigate the effects of military spending on economic growth by using a panel data

Table 4: Descriptive statistics (1988-2013)

Statistics	GDPB (US $ M.)	GDPI (US $ M.)	GDPN (US $ M.)	GDPP (US $ M.)	GDPS (US $ M.)
Mean	52600	722000	7110	93400	21900
Median	47500	617000	7050	86700	19900
Maximum	97900	1460000	11400	147000	41100
Minimum	26600	313000	3870	53200	11100
Standard deviation	21500	358000	2250	28400	8680
Skewness	0.63	0.71	0.30	0.35	0.69
Kurtosis	2.22	2.24	1.99	1.83	2.43
Jarque-Bera	2.39	2.80	1.50	2.01	2.40
Probability	0.30	0.25	0.47	0.37	0.30
Statistics	**GFCFB (US $ M.)**	**GFCFI (US $ M.)**	**GFCFN (US $ M.)**	**GFCFP (US $ M.)**	**GFCFS (US $ M.)**
Mean	11800	229000	2010	19500	5610
Median	10200	160000	1590	18400	4610
Maximum	26100	535000	4470	26600	12000
Minimum	3880	72100	766	12800	2550
Skewness	0.61	0.76	1.04	0.31	0.83
Kurtosis	2.21	2.05	2.90	1.97	2.51
Jarque-Bera	2.28	3.47	4.71	1.56	3.23
Probability	0.32	0.18	0.09	0.46	0.20
Observations	26	26	26	26	26
Statistics	**MEB (US $ M.)**	**MEI (US $ M.)**	**MEN (US $ M.)**	**MEP (US $ M.)**	**MES (US $ M.)**
Mean	933	30200	159	5570	1240
Median	898	28100	118	5090	1290
Maximum	1640	49600	285	7640	1850
Minimum	474	16800	66	4190	367
Standard deviation	335	11700	85	996	440
Skewness	0.81	0.56	0.27	0.47	−0.47
Kurtosis	2.94	1.91	1.29	2.04	2.13
Probability	0.24	0.26	0.17	0.38	0.41
Statistics	**TRGDPB**	**TRGDPI**	**TRGDPN**	**TRGDPP**	**TRGDPS**
Mean	33.15	23.50	35.60	31.58	60.26
Median	31.56	19.34	37.28	31.79	61.79
Maximum	54.20	42.14	43.26	37.82	77.20
Minimum	16.48	10.76	20.93	26.87	41.35
Standard deviation	12.10	10.04	5.67	2.72	8.98
Skewness	0.25	0.70	−1.29	0.32	-0.38
Kurtosis	1.88	2.17	3.83	2.79	2.38
Jarque-Bera	1.63	2.90	7.91	0.48	1.04
Probability	0.44	0.24	0.02	0.79	0.59
Observations	26	26	26	26	26

Table 5: Panel unit root test results

Tests	LNGDP		LNME		LNGFCF		TRGDP	
	Level	FD	Level	FD	Level	FD	Level	FD
LLC	5.48 (1.00)	−7.33 (0.00)	0.01 (0.50)	−5.32 (0.00)	0.82 (0.79)	−7.89 (0.00)	−0.82 (0.20)	−12.62 (0.00)
IPS	7.27 (1.00)	−6.52 (0.00)	1.95 (0.97)	−4.95 (0.00)	3.38 (0.99)	−7.93 (0.00)	0.08 (0.53)	−11.22 (0.00)
ADF–FC	0.93 (0.99)	55.96 (0.00)	3.11 (0.97)	42.24 (0.00)	2.18 (0.99)	69.56 (0.00)	10.34 (0.41)	99.66 (0.00)
PP–FC	6.88 (0.73)	56.13 (0.00)	2.86 (0.98)	42.49 (0.00)	2.07 (0.99)	71.29 (0.00)	10.11 (0.43)	104.04 (0.00)

Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. IPS Test assumes asymptotic normality

Table 6: Panel cointegration tests

Johansen Fisher panel cointegration test		
Hypothesized No. of CE (s)	**Fisher statistics from trace test**	**P values**
None	59.32	0.00
At most 1	22.93	0.01
At most 2	14.46	0.15
At most 3	10.80	0.37
Kao residual panel cointegration test results		
Null hypothesis	**Statistic**	**P**
No cointegration	−3.10	0.00

of five South Asian countries spanning over 1988-2013. The results of this study confirm widespread inequalities among nations. The econometric results reveal the positive effect of military expenditure on economic growth but this positive effect is negligible compared to the alternative use of scare resources as non-military expenditure. Military expenditure has huge opportunity cost. The present study categorise military expenditure as a sub-optimal means of increasing economic growth given that other alternative uses of government spending such as on infrastructure, formation of fixed capital, etc. The present study concludes that the boosting of economic growth through higher

Table 7: Hausman specification and Wooldridge test results

Test	Null hypothesis	Test statistics	P
Hausman specification test	Ho: Difference in coefficients not systematic	81.47	0.00
Wooldridge test for autocorrelation	Ho: No first-order autocorrelation	40.076	0.0032

Table 8: Fixed effects (within) model results with AR (1) disturbances

Dependent variable: LNGDP			
Independent variables:	**Equation 1**	**Equation 2**	**Equation 3**
C	12.03* (0.00)	12.54* (0.00)	12.46* (0.00)
LNME	0.13* (0.01)	0.12* (0.07)	0.08 (0.4)
LNME(−1)	-	-	0.10* (0.00)
LNGFCF	0.42* (0.00)	0.40* (0.00)	0.35* (0.00)
LNTRGDP	-	0.06 (0.14)	0.05 (0.14)
R-sq: within	0.70	0.68	0.64
R-sq: between	0.99	0.99	0.98
R-sq: overall	0.98	0.99	0.98
N	125	125	120
F-statistics	136.99	83.98	49.47
Prob>F	0.00	0.00	0.00

Notes: Numbers in round brackets are the standard errors. * denote significance level at 1%.

military expenditure is neither effective nor efficient way of achieving higher growth in the economy. Diversion of resources in SAR becomes a question of utmost importance as millions of people are struggling for basic human needs. This study also concludes that private investment is more productive and military spending may be having dampening effect on private investment. Empirical results reinforce this by indicating that resources used as productive capital formation is four times more growth enhancing compared to the resources used as military expenditure. Despite lower impact on economic growth, substantial share of scarce resources are diverted towards military expenses as the resource allocation is made on the perceptions of elites in the region. There is a strong need of peace initiatives in the region so that we can boost economic growth rate of the region and can provide basic human needs to the deprived population of this region.

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