



Security Contribution To National Growth In Saarc Nations

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Abstract

The paper aims to investigate if the security expenditure impacts the national growth among SAARC countries and tries to find correlation between Defence Liability and GDP growth rate of the nations. The paper uses time series data of 30 years from 1988 to 2018 for five SAARC countries of India, Bangladesh, Sri Lanka, Pakistan and Nepal. The paper finds positive association between Defence Liability and GDP growth rate in case of India, Pakistan and Nepal. The result in case of India indicates that every 1% increase in Defence Liability would fetch about .058% increase in GDP growth. The paper also evaluates Granger Causality to find that Defence Liability only in case of India Granger causes GDP growth rate but reverse is not true.

Keywords: Budget constraints, Central Government Expenditure, Defence Liability, GDP growth rate.

Introduction

Economic growth of a nation is largely associated with investment, fiscal and monetary policy, external balance of trade, energy needs and security expenditure. Government expenditure is one of the major determinants¹ of economic growth.

Expenditure on productive sector enhances productivity (quality) of capital and labour which directly influences economic growth as per productivity² function. Spending on non-productive sector also assists economic growth but in an indirect and incremental manner.

Defence is a public good. Government expenditure must create public good which leads to economic growth of the nation. The COVID-19 Pandemic has crippled the world economy and it has seen the worst recession of the millennium. There is a unanimous belief that government across the globe must spend to create demand. There are also

¹ Zaheer,R. & Gilani,S (2017).Military Expenditure and Economic Growth in SAARC Countries, International Affairs and Global Strategy, IISTE

² Ahmed, N. & Naslmosavi, S (2017, September) Military Expenditure and Economic Growth in SAARC Countries: Pooled and panel Data Analysis, Journal of Applied Finance and Economic Policy, IFASRA

varying school of thoughts to create demand through immediate social spending or through long term capital infrastructure spending. Defence expenditure is one such determinant which needs to be studied for its impact on economic growth.

As per Keynesian economic theory, aggregate demand rises when there is more public funding. This increases effective utilization of capital leading to better prospects of profits, investment and higher growth potential. Both supply and demand side expenditure influences public spending on economic growth. Defence budget constitute substantial resources which are fully financed by government. Military expenditure may also affect economy positively by creating demand and employment. There is a raising debate about fiscal and monetary policy and economic trade-off between growth and inflation management at the central bank and government level, quality and quantity of spending and its impact to achieve early economic recovery to pre COVID levels.

SAARC Nations

The South Asian Association for Regional Cooperation is an inter-governmental organisation³ and geo political union of states consisting of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. It comprises 3% of world area, 21% of world population and constitutes about US \$ 5 trillion combined economy at pre COVID levels.

No country in South Asia today faces an external threat which can challenge their existence as nation. India and Pakistan long outstanding border and political issues enhances the defence expenditure in the region. The real threat⁴ to South Asian countries is internal in terms of extremism, terrorism, Left wing movements, military dominance in governance and radicalization of Islam etc. To an extent, Afghanistan and Pakistan are only two SAARC nations which face existential threat mostly spurred due to internal contradictions of the society.

SAARC countries are mostly developing and under developed nations. Nation building is still under progress and sovereignties are stoutly defended to keep their societies independent of any external influence. There is no collective security organization in the region. SAARC is an organization basically for trade and commerce but security concerns have never been out of its purview. Security anxieties⁵ and relations based on it have sometimes overpowered the trade agenda and have affected regional associations adversely. The present impasse in SAARC is the result of trust deficit on security issues among bigger nations. Therefore it is interesting to study the evolving nations, its security along with its impact of security expenditure on their national growth. The aim of the paper is to analyse the impact of defence expenditure of SAARC countries on their growth outputs based on GDP parameters and infer relationship between military expenditure

³ Retrieved from <https://www.saarc-sec.org>

⁴ Retrieved from <https://www.brookings.edu>

⁵ Bajpai, K. (1996, March). Security and SAARC. SAGE Publications New Delhi/Thousands Oaks

and growth rate if any. Do the resources committed on security of nation contribute towards nation building!

Literature Review

The allocation of resources for defence spending has always been in sharp analysis due to raising debate of Security vs Development dilemma. The world literature is divided on the impact of defence spending on economic growth of the nation. Few experts like Hong (2009), Aizenman and Glick (2003) believe that both have a significant negative relationship as they induce crowding out of resources from public space. Opportunity cost⁶ in terms of reduction in investment due to resource diversification, Balance of Payment issue due to impending defence imports and likely increase in inflation due to enhanced defence spending are few issues which affect country's economic activity but these fears do not have a very clear evidence. The opponents like Mylonidis (2006), Dunne (1990) etc argue positive relationship and believe that larger apportion of resources to defence budget sometimes encourage R&D, enhanced security, create demand, and may cause increase in labour and in savings in smaller and developing economy. There is also a third school of thought which has concluded no correlation between defence spending and economic growth. Authors like Alexander (1990), Huang and Mintz (1990) etc have found no relation between the two variables. All these studies are based on group of countries using cross sectional data. In Indian context, studies by Kanchan Dutta (2017), NaHou (2009) etc have found a negative relationship between defence spending and national output for India.

Data Set of SAARC

The paper analyses time series data of defence expenditure and its impact on national growth parameters by estimating relationship with GDP. Many attempts have been made in past like Deger study in 1986, Sandler & Hartley in 1995, Hassan et al in 2003 etc these studies have different data set of different group of countries and in different time period. Nadeem Ahmed (2007) study deliberates on SAARC countries but data set is limited to 2002 to 2014.

This paper uses time series data for 30 years from 1988 to 2018 of five SAARC countries i.e India, Bangladesh, Pakistan, Nepal and Sri Lanka. The data set and all variables have been taken from World Bank⁷ and SIPRI sources. The data for Afghanistan has statistical breaks and is not maintained by these agencies for few years in between for the selected period. Data for Maldives is completely unavailable for the complete period.

Table No 1 SAARC Defence Expenditure (in US M \$ at 2018 constant price)

Period(Year)	INDIA	BANGLADESH	NEPAL	PAKISTAN	SRILANKA
1988	18983	750	68.4	4369	455

⁶ Deger, S., & Smith, R. (1983). Military Expenditure and Growth in Less Developed Countries, Journal of Conflict Resolution

⁷ Retrieved from <https://www.databank.worldbank.org>

1989	20004	820	74.5	4382	351
1990	19704	815	77.6	4625	478
1991	18398	831	79.6	4951	653
1992	17583	956	82.7	5265	731
1993	19859	1038	86.2	5238	784
1994	19948	1164	85.7	5087	910
1995	20546	1197	84.7	5175	1532
1996	20918	1251	84.3	5174	1431
1997	23156	1331	89.3	4954	1270
1998	24159	1350	90.6	4954	1332
1999	28077	1399	98	5003	1199
2000	28972	1461	107.7	5013	1604
2001	29981	1460	139	5363	1339
2002	29888	1461	186	5768	1108
2003	30555	1421	207	6163	997
2004	35493	1448	247	6417	1110
2005	37772	1468	273	6679	1028
2006	38078	1580	257	6789	1186
2007	38538	1662	247	6836	1453
2008	43712	1642	261	6445	1664
2009	51464	1916	293	6642	1718
2010	51671	2307	307	6888	1601
2011	52171	2445	317	7261	1678
2012	51986	2573	301	7700	1516
2013	51603	2564	330	7954	1557
2014	54276	2740	373	8357	1826
2015	54292	3095	358	9078	1968
2016	59833	3402	380	9382	1717
2017	64572	3315	438	10391	1788
2018	66258	3692	429	11529	1681
Mean	36208.0645	1759.806452	208.1387097	6446.193548	1279.516129
Std Dev	15546.8475	827.7085807	122.2079203	1807.657497	440.5958746
Coff of Var	42.9375272	47.034069	58.7146526	28.0422467	34.43456981

(Source: https://sipri.org/sites/default/files/2021-04/fs_2104_milex_0.pdf)

Mean and Standard Deviations of defence expenditure of a particular country may represent percentage minimum, maximum and average among SAARC countries. But this measure of defence expenditure does not permit an international comparison basically because of varying size, characteristics and different security dynamics of SAARC countries. As the time series data has different measures or values for SAARC nations,

concept of Coefficient of Variation⁸ has been used in this paper. It is the ratio of Standard Deviation to the mean (average) thus measures relative variability. By merely looking at the Standard Deviation values, it does not give the true picture of variation in defence expenditure. But once the result is adjusted for the difference in their respective means, the results are more significant. It is seen that Nepal has the maximum variation and has most volatile value of Standard Deviation in defence expenditure over the period. Pakistan has been able to manage one of the lowest variations in defence expenditure amongst bigger countries of SAARC nations. This may hint at relative priority of Defence spending in overall scheme of central expenditure by respective countries.

In order to investigate the association between defence expenditure and GDP growth rate among SAARC nations, correlation⁹ analysis based on variable distribution has been carried out. It basically brings out values expressing association of defence expenditure with GDP growth rate and determines interconnection or co-relationship between them. For this purpose, the following indicators have been used:-

- (a) GDP growth rate (**G**) to depict economic growth.
- (b) Defence Liability (**D**) which is a ratio of rate of increase /decrease of defence expenditure to rate of increase /decrease of GDP growth rate.

Correlation between Defence liability and GDP growth rate has been found using Excel solver and Karl Pearson Coefficient are tabulated below. It shows negative correlation for Bangladesh and Sri Lanka which means increase in defence liability will not result in increase in their GDP growth rate. However, India, Pakistan and Nepal show positive but varying degree of association between two variables. This signifies that a change in defence liability in these countries would cause positive change in economic growth rate of the country.

Table No 2: Tabulation of correlation coefficients

Ser No	Name of Country	Karl Pearson Coeff.
1	India	0.073538346
2	Nepal	0.092540577
3	Sri Lanka	-0.21190189
4	Pakistan	0.159103645
5	Bangladesh	-0.2610755

(Source: Excel Worksheet)

OLS Regression Analysis

To estimate the effect of change in GDP growth rate by unit change in defence liability, the methodology of Ordinary least Square Regression analysis for individual SAARC country has been carried out. The pooled data for all SAARC countries in this analysis do not give meaningful result as the political, social and economic condition of countries

⁸ Retrieved from <https://www.statisticshowto.com>

⁹ Bajpai, Naval. (2011). Business Statistics. Pearson India.

have vast difference amongst themselves. A simple linear regression based on slope-intercept equation has been used. The straight line regression model with respect to population parameters β_0 and β_1 can be given as

$$Y = \beta_0 + \beta_1 X$$

where β_0 is the population Y Intercept which represents the average value of economic growth rate when Defence Liability is zero. β_1 indicates expected change in the value of Defence Liability. Introducing ξ , the error of regression line, the probabilistic model is given by

$$Y = \beta_0 + \beta_1 X + \xi$$

The regression statistics for individual countries have been compiled below.

Table No. 3: Compilation of Regression statistics of SAARC Countries

Ser No	Parameters	India	Bangladesh	Pakistan	Sri Lanka	Nepal
1	Multiple R	0.0735	0.2611	0.1591	0.2119	0.0925
2	R Square	0.0054	0.0682	0.0253	0.0449	0.0086
3	Adjusted R Square	-0.0301	0.0349	-0.0095	0.0108	-0.0268
4	Standard Error	1.8965	1.1622	1.7056	2.0524	1.7835
5	Observations	30	30	30	30	30
6	Intercepts	6.2754	5.4630	4.2324	5.2298	4.5225
7	X Variable 1	0.0581	-0.1653	0.1390	-0.1996	0.1018

(Source: Excel Worksheet)

Inferences

It is observed (from X variable values) that India, Pakistan and Nepal have positive correlation and Bangladesh and Sri Lanka has negative correlation. It further indicates that even if the Defence Liability is made hypothetically zero, then also GDP growth rate would increase by about 6.275%. The result also indicates that 1% increase in Defence Liability would fetch an increase of about .058% increase in the national GDP growth rate being a huge economy of India. This impact increases further in case of Pakistan and Nepal.

It is further inferred from R Square Value (.0054) of India that only .54% variation in GDP growth rate can be attributed to Defence Liability. It means that 99.46% variation in GDP growth rate is explained by factors other than Defence Liability. In case of India, the standard error is very small. It shows very small scatter or variation around the regression line. This is verified from the fact that the defence expenditure in India has been vacillating from 3.7% to 2.4% for last 30 years. Similar inferences can be drawn for other SAARC countries from the table above.

Granger Causality

Correlation in GDP growth rate and Defence Liability doesn't necessarily imply causality while we have measured degree of association between the two variables but it is harder to determine whether defence liability causes GDP growth rate. That's why Granger Causality¹⁰ test on time series data has been carried out to find evidence that Defence Liability Granger causes GDP growth rate among SAARC nations. Causality is closely related to cause and effect but not in its true sense. It only brings out precedence between variables in time series data.

Hypothesis. The null hypothesis of the test is that lagged values of Defence Liability (X) do not explain the variation in GDP growth rate values (Y)

H₀: x(t) does not granger cause y(t)

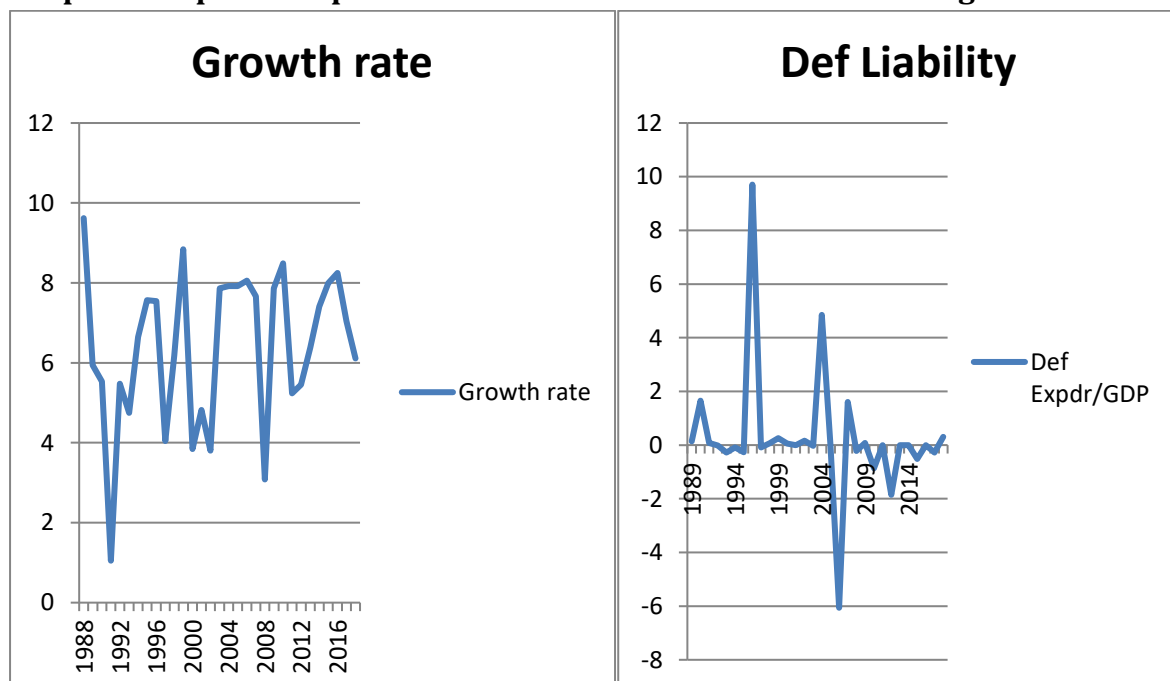
H₁: x(t) granger cause y(t)

Time series data on both variables are first made stationary by differencing. ADF Test is carried out to check presence of unit root and if the data set so obtained is stationary. Granger Causality test based on P values is carried out by Real Statistics Resource Pack using Excel by using function

GRANGER_TEST(R_x,R_y,lags)¹¹= P-Value of the test

India

Graph 1: Graphical Representation of Data set before Differencing India



¹⁰ Retrieved from <https://www.real-statistics.com>

¹¹ Real Statistics Function by Charles Zaonitz. Retrieved from <https://www.real-statistics.com/time-series-analysis>

Graph 2: Graphical Representation of Data after Differencing India

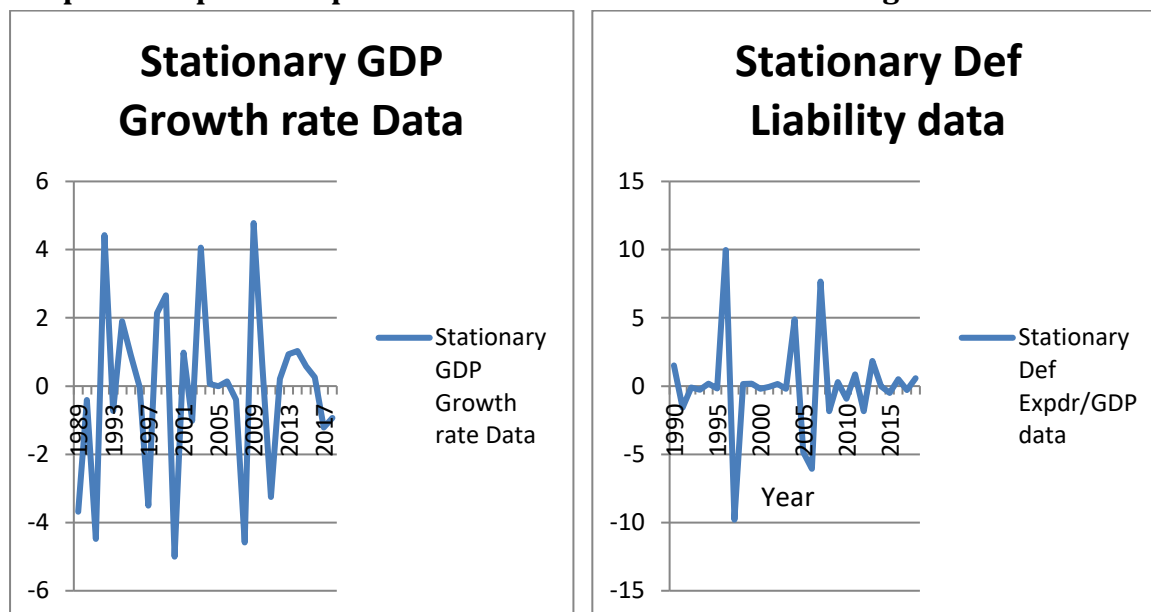


Table No 4: ADF Test for stationarity India

D, T type=0		D,T type=1		D,T type=2	
tau-stat	-8.65379	tau-stat	-8.49365	tau-stat	-8.32862
tau-crit	-1.95298	tau-crit	-2.96788	tau-crit	-3.56237
stationary	yes	stationary	yes	stationary	yes
aic	5.198464	aic	5.269582	aic	5.340543
bic	5.246043	bic	5.364739	bic	5.483279
lags	0	lags	0	lags	0
coeff	-1.46726	coeff	-1.46733	coeff	-1.46709
p-value	< .01	p-value	< .01	p-value	< .01
G, T type=0		G, T type=1		G, T type=2	
tau-stat	-7.62053	tau-stat	-7.47923	tau-stat	-7.33442
tau-crit	-1.95298	tau-crit	-2.96788	tau-crit	-3.56237
stationary	yes	stnary	yes	Stnary	Yes
aic	4.578842	aic	4.65003	aic	4.72093
bic	4.626421	bic	4.74519	bic	4.86367
lags	0	lags	0	lags	0
coeff	-1.36728	coeff	-1.36751	coeff	-1.36729
p-value	< .01	p-value	< .01	p-value	< .01

Table No 5: Granger Test Result for India

	D->G	G->D
lag=1	0.034733	0.224343

lag=2	0.220447	0.660679
lag=3	0.025241	0.880588
lag=4	0.008692	0.210854

Similar data analysis for all SAARC countries has been carried out in the source Excel sheet and results are compiled as under

Table No 6: Compilation of P values from Granger Function for SAARC Countries

Lag s	India		Nepal		Sri Lanka		Bangladesh		Pakistan	
	D->G	G->D	D->G	G->D	D->G	G->D	D->G	G->D	D->G	G->D
1	.034 733	.2243 43	0.874581	0.916 277	0.51831	0.98615 2	0.87039 7	0.45038 7	0.678607	0.9454 72
2	0.220 447	0.660 679	0.539031	0.975 066	0.78474 2	0.05297 4	0.92504 4	0.33305 3	0.740274	0.8302 59
3	0.02 5241	0.880 588	0.805325	0.970 1	0.57851 8	0.20824 6	0.96306 2	0.59159 8	0.753414	0.3589 49
4	0.00 8692	0.210 854	0.775264	0.908 69	0.55062 6	0.25562 5	0.99860 1	0.29648 1	0.833125	0.5179 78

(Source: Excel Sheet)

Analysis of Granger Result

As the Observed Level of Significance (P Value) at 95% confidence is lower than the Assured Level of Significance ($\alpha = .05$). The null hypothesis must be rejected. We have seen earlier that India, Pakistan and Nepal has shown positive correlation but it is only in case of India at various lag values, the null hypothesis is rejected. That is Defence Liability in case of India Granger causes GDP growth rate but reverse is not true. Pakistan and Nepal in spite of showing positive correlation show higher P values. Thus Defence Liability does not granger cause GDP growth rate. Therefore the values of defence spending in India do precede in a pattern in the future time series values of GDP growth rate for India.

Conclusion

All countries today spend substantial resources on security in congruence with their national income to keep borders intact and maintain internal peace for the prosperity to grow. The issue of defence expenditure leading to growth is under intense debate and have various schools of thought. This paper has chosen SAARC as it is a conglomeration of countries consisting of large /small, developing/underdeveloped, security

active/passive nations representing a mixed class. The impact of defence expenditure on national growth of five countries (India, Bangladesh, Pakistan, Nepal and Sri Lanka) has been studied based on panel time series data for the period 1998 to 2018. Regression and correlation analysis has been done for five countries separately to ascertain their relationship in each country. The result shows mixed picture and brings out positive relationship in case of India, Pakistan and Nepal and negative relationship in case of Bangladesh and Sri Lanka. Analysing Indian parameters, it is observed that defence liability GDP growth rate is positively related but very loosely associated. It explains only .54% variation in national GDP growth rate. Therefore 99.46% variation in economic growth is explained by factors other than Defence Liability.

The paper has attempted to measure not only degree of association between Defence Liability and GDP growth rate for SAARC countries but has gone step ahead to find causality between them. In spite of having positive relationship between GDP growth rate in Pakistan, and Nepal, Defence Liability does not granger cause GDP growth rate. It is only in case of India that Defence Liability granger causes GDP growth rate in a unidirectional manner at few lagged values but does not show a bi directional causality. It may not be depicting a cause and effect relationship in true sense but Defence liability data certainly precedes GDP growth in time series continuum.

The result of the above estimation shows mix picture for SAARC countries. This estimation is consistent with many previous studies like Benoit (1973), Hassen et el (2003), Yeilderim et el (2005) and Zaman et el (2003). However it also differs with many studies like Deger(1986), Hou & Chen (2013) and Dunne & Tian (2015).

Though the estimation shows positive relationship between defence Liability and economic growth in context of few countries, it suggests that increase in expenditure of defence sector can help these economies to grow better. However the impact of defence liability on economic growth of the nation might also be dependent on composition of expenditure. The capital expenditure which is spent on long term dual use infrastructure projects to be used equally by civil and military population, production of plant and machinery leading to job creation, assisting growth of MSME and productive labour capital would plough back spin off benefits into economy. The revenue expenditure of defence liability catering for operational maintenance of defence forces and spent on pay, pension, ammunition, fuel, rations, transport, training, exercises etc have sunk in effect and do not return much benefits to national economy. Working to achieve Atmanirbhar Bharat in defence sector, promulgation of negative import list and setting portion of Defence Capital budget for domestic manufacturing in India are policy decisions aligned to these estimations.

It is evident that every country has different impact of its defence liability on economic growth. Therefore the policy maker must seek a balance between productive and non-productive expenditure of its budget to maximise return from defence budget.

Abbreviations Used

1. COVID-19- Coronavirus disease 2019.
2. GDP- Gross domestic product.

3. MSME- Micro small and medium enterprises.
4. R&D- Research and Development.
5. SAARC- South Asian Association for Regional Cooperation

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