

Debt - Defense Relationship in South Asian Economies

Seerat Sultan* and Saima Sarwar**

Abstract: This study examines the debt-defense association in South Asian economies, for the panel data of six South Asian Economies: Pakistan, Bangladesh, Sri Lanka, Nepal, India and Afghanistan over the time period 1990 to 2013. Using panel data technique of co-integration and sequentially Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) estimators, this study finds that the military expenditure has negative relationship with external debt in this region.

Keywords: Public Expenditures, Security & War, Debt, Panel Data.

JEL Classification: E62, H56, H63, C23

1. Introduction

A number of studies focus on the association among defense expenditure and economic growth while only some studies give attention on the association among defense expenditure and external debt. This is important point to examine the nature of relationship between defense expenditure and external debt because external debt is considered a solution for those countries whose income is low but their defense expenditure is very high.

“One of the most difficult and complex problems in political science and economics is to try to calculate the costs of modern war.” Joseph C. Farah.

Asia is the main continent in the world. This region is divided in the areas like: Southern Asia, Western Asia, and Central Asia. More than one fifth world population lives in South Asia and the 2011 data shows that 1678 million population lived in this region. Poverty is the main

issue in South Asia on the one side and other is war. India and Pakistan is nuclear power and it makes this region unstable and risky.

The history of South Asia regime also plays a major role in the high defense expenditure. There are shortages of capital, bad governance, corruption in accountability sector, uneducated people so, they do not understand things in better way, religious problems, and security problems and so on. These are the issues which force these countries to increase the defense expenditure. But through defense expenditure the human capital getting benefit somehow like military industries give them skill, development in the infrastructure, increase R&D, Defense expenditure delivers security to the country people, that increase the confidence of domestic as well as foreign investors which leads to enhance the trade and investment climate in country.

However, external debt itself doesn't lead to bad impact on economic progress but huge external debt can harm the domestic currency, terms of trade, and economic progress. Brzoska (1983) explained in his study that external debt for defense expenditure leaves bad impact on development. Dunne and Freeman (2001) discovered that use foreign exchange reserve on defense expenditure will decrease capital to import intermediate goods which leads to long-run impact on economic growth.

These are the main six South Asian economies: Afghanistan, Bangladesh, Pakistan, India, Sri Lanka and Nepal who spend large amount on defense expenditure. In this region major growing in defense sector happened after the 9/11 attack and war in Afghanistan. In South Asia India and Pakistan are nuclear power and both Pakistan and India have miserable positions on the United Nations Development Program and Human Development Index: India is on 128 number and Pakistan on number 136. This situation shows that defense expenses cannot increase the social welfare. The major issue between these two countries is Kashmir. The data shows in terms of Military expenditure (% of GDP), 3% in the case of Pakistan; 2.5% in the case of India (SIPRI data on military expenditures 2013).

Afghanistan government is supported by the US and it controls only Kabul, other area of Afghanistan is controlled by Taliban. Taliban is a brutal terror organization with no economic or social agenda. Taliban are the major issue in South Asia and reason of increasing the defense expenditure. Sri Lanka is small country but due to Liberation Tigers of Tamil they increase defense spending in 80's and now has large military power. In terms of military expenditure as percentage of GDP: in Sri Lanka 2.8%; in Afghanistan 6.3% (SIPRI data on military expenditures 2013).

Bangladesh is facing the problem of religious extremism and all minorities spend their life under the fear of harassment. Nepal increased major defense expenditure in 90's due to the monarchy's struggles to crush the democratic and Maoist forces within the country. Nepal has no issues with neighbor but due to internal issues its defense expenditure is high. The data shows that military expenditure (% of GDP), 1.3% in the case of Nepal; 1.2% in the case of Bangladesh (SIPRI data on military expenditures 2013).

External Debt is the most important issue for the South Asia. In the view of political researcher and economists that external debt is problem for the under developing economies. In South Asia, Pakistan, India and Bangladesh are the main debtors from IMF (International Monetary Fund). There are many external reasons that force country for external debt like: the Oil Shock, global Wars, International Inflation, export Deficit, the Policies of the Developing Economies, policy of Industrialized Countries.

In 1990's Sri Lanka data showed that the debt to GNP ratio was beyond than critical level (>50) and debt to export rate was lower than the 170%. In case of Pakistan debt to GNP ratio and debt to export rate was more than critical level and has increasing trend. In India the debt to export rate was more than critical level and debt to output rate was lower than critical level but India shows the decreasing trend.

Pakistan is among the top 12 debtor countries of the World Bank. In Pakistan, India and Bangladesh the repayment of external debt is the

major problem now-a-days. And the current economic policies are not able to fill the gap between budget deficits, balance of payment and poverty also increases day by day.

The above debate explains that defense expenditure has a connection with external debt somehow. In literature we find that the majority of the countries spend a lot on defense expenditure and they also use external debt to fulfill their required needs. Some studies show positive impact of defense expenditure on external debt like: Karagol (2006), Narayan and Narayan (2008) and Smyth and Narayan (2009), and some studies show there is negative influence among defense expenditure and external debt like: Karagol and Sezgin (2004). Hence this study aims to explore this nexus in case of South Asian nations which are prone to both types of economic ills.

The objective of this study, keeping in view the problem statement i.e. to investigate the nature of long run relationship between defense expenditure and external debt for South Asian economies.

2. Literature Review

Here is a brief review of past studies indicating the nature of relationship between these two variables in various regions of the World.

Brzoska (1983) investigated that credit payments are the major cause of arms imports in Third world countries. Round about the second part of seventh decade of the last century data showed that these countries fulfilled their half arms import through credit payments. The analysis of the data showed that defense credits in the seventies of the last century increased 20% to 30% in 3rd world countries. In 1979 credit amount rate was between 20% to 30% but interest on old debt amount was doubled. This increase made huge burden on the third world countries every year and this is important element in the third world countries in arms import situation.

Dunne *et al.*, (2004) investigated the relationship between military expenditure and debt of 11 small industrializing economies by panel data. In this paper they used techniques like fixed effects, Random effects and Dynamic models. The result displayed that the military expenditure has a progressive influence on the external debt.

Narayan and Narayan (2008) investigated Fiji's debt burden using the data from 1970-2005 and observed that military expenditure has a share to increase the debt level in Fiji's. This study showed that defense expenditure has a positive impact on external and internal debt rate in long run and income has positive influence on internal debt and negative effect on external debt, using co integration test and vector error-correction

Georgantopoulos and Tsamis (2011) described the relationship among military spending and external debt for Northern Africa nations. In this paper they used data of four Northern Africa nations (Egypt, Morocco, Algeria and Tunisia) and they used time period of 1988-2009. The co-integration test found that there is long run relationship but VAR and Error Correction found there is no relationship among military spending and external debt in these three countries.

Muhanji and Ojah (2014) explored that the Heavily Indebted Poor Countries (HIPCs) in Africa have positive relationship among military spending and external debt. The external debt increases in HIPCs when military expenditure increases and HIPCs are crazy about war and the external debt increase with the passage of time. This paper used the panel data and the result showed that military expenditure has rising pressure on external indebtedness through pre-war, war and post war times.

Through this study we find the relationship status between debt-defense in the South Asian economy because some studies claim that defense expenditure is important to explain the debt situation. This paper makes a further contribution to the literature. It considers impact of defense expenditure on debt in South Asian economy by using panel data.

3. Methodology

Our research covers annual data from 1990 to 2013 using panel data with log-linear model estimation. We use data of six South Asia Economies. To estimate the Model we use these techniques: panel unit root test and panel co-integration test and to see the long run relationship among variables we use, Fully Modified OLS and Dynamic OLS estimators. The panel unit root test and panel co-integration both test first study the integration order between variables and if the result shows the variables are non-stationary than test variables are co-integrated. The panel co-integration allows us to check that there is long run or short run influences of defense expenditure on external debt. The fully modifies OLS and dynamic OLS methods are used to estimate the long run relationship among variables. The panel unit root and panel co-integration method includes three stages. Firstly, we observe that the panel unit root problem has present in variables or not and if the panel unit root problem presents in variables than we apply the panel co-integration. If panel co-integration is present than we move to FMOLS, and DOLS.

4. Variables and Data Sources

The data is collected from World Development Indicator (WDI), Stockholm International Peace Research Institution (SIPRI) and International Monetary Fund (IMF).

External debt is used as the dependent variable. Principal repayments on external debt, long term (AMT, current US \$) is being used as a proxy for measuring this variable. The data is available in form of current U.S dollars. Military expenditure (% of GDP) contains all current and capital military expenditure like: peacekeeping force, Govt. agencies on defense mission, defense ministries, military research and development, military space activities, retirement allowance for military person, military operation and maintenance.

The official exchange rate (LCU per U.S \$, period Average) is used to measure exchange rate. It is calculated as an annual average which is based on monthly averages in local currency relative to the U.S. dollar. Inflation is measured by GDP deflator (annual %) which can be defined by the annual growth of GDP implicit deflator. It displays how much price change in entire economy. The variable population (total) includes all residents which have legal citizenship and does not include the refugees who do not permanently live in the country The adjusted net national Income (current US \$) is used as an Indicator which reports that adjusted net national income is GNI minus consumption of fixed capital and natural resources depletion.

5. Model

In this study we use one model that is actually log-log model. We convert the dependent variable and independent in to log form because there is a possibility of non-linear relationship among the dependent variable and independent variables.

$$\log PR_{i,t} = \beta_{0,i} + \beta LER_{i,t} + \beta LME_{i,t} + \beta LP_{i,t} + \beta LINF_{i,t} + \beta LNNI_{i,t} + e_{i,t} \quad (1)$$

Here natural log of the variable represents:

PR = External debt,

ER = Exchange rate,

MEGDP = Military expenditure,

P = Population,

INF = Inflation,

NNI = Net national income,

$e_{i,t}$ = Error term.

Before applying these two techniques, we have to see that the following series are stationary or non-stationary so we apply unit root test to see the data is stationary or not. After this we applied panel co-integration to observe that variable are integrated with each other or not than we moved further to see the nature of relationship between variables.

5.1 Panel unit root test

Lin *et al.*, (2002) described the panel unit root test with the help of null hypothesis of the unit root test along with the homogeneous stationary hypothesis and the model is:

$$\begin{aligned} & \Delta Y_{it-1} \\ & = \delta_i Y_{it-1} + \sum_{L=1}^{p_i} \theta_{iL} \Delta Y_{it-L} + \alpha_{mi} d_{mt} \\ & + \varepsilon_{it} \end{aligned} \quad (2) \quad m = 1,2,3$$

The model describes three things 1. $d_{1t} = \emptyset$ that no individual effect, 2. $d_{2t} = (1)$ and series is Y_{it} , it contains individual-specific mean but not have time trend, 3. $d_{3t} = (1, t)$ and the series is Y_{it} , it contains individual-specific mean, linear and also have individual-specific time trend.

$$H_0: \delta = 0$$

$$H_1: \delta < 0$$

As a first step, all five variables in level and first difference are verified for the unit root test by using the Augmented Dickey Fuller (ADF) test and the Philips Perron (PP) test, table 5.1 & 5.2 presents the ADF test results and PP test results are shown for the log at levels and first difference. The logs of variable are used *LMEGDP*, *LINF*, *LER*, *LP* and *LNNI*. The panel unit root method that account for individual unit root and common unit root is used. The Dickey Fuller test is used for error terms and explains that error term is independently and identically distributed. The ADF test adjusts the Dickey Fuller test to take care of possible serial association in the error terms by adding the lagged difference terms of the regression. Phillips and Perron use non parametric statistical methods to take care of the serial relationship in the error terms without adding lagged difference terms.

5.2 Panel Co-integration Test

Panel co-integration means that the residuals from a panel long-run model are stationary in that the mean, variance, and covariance are constant for the panel residual series. The reason of the co-integration test is to define whether sets of non-stationary series are co-integrated or not. Engle and Granger (1987) pointed out that a linear grouping of two or more non-stationary series may be stationary. Thus, if such a stationary linear grouping occurs, the non-stationary time series can be co-integrated. The stationary linear grouping is called the co-integrating equation and may be interpreted as a long-run equilibrium relationship among variables. To check there is long-run relationship present in the model we use a panel co integration test. Pedroni (2004) found different tests to check the null of panel co-integration. We used within-dimension and between-dimension. The ‘within dimension’

examines the collective time period and it allows heterogeneity in across countries. The within-dimension covers four tests: panel rho-statistics, panel v -statistics, panel ADF-statistics, and panel PP-statistics. The ‘between dimensions’ tests display the group mean co-integration and it allows for heterogeneity in parameters across nations. The between-dimension covers group PP-Statistic, group rho-statistic, and Group ADF-Statistic. In the situation of power the panel ADF statistics which based on within-dimension tests and between-dimension Pedroni (2004) explained that ADF tests are better than others tests.

After evaluating whether the series are stationary of one order, the next step is to analyze whether variables are integrated with each other or not so that we could move on to observe the nature of relationship among these as well. For this purpose we have applied Pedroni co-integration test. Basically Panel co-integration has seven statistics. In this test we have null hypothesis i.e.

H_0 : Series have no co integration

H_1 : Series have co integration

The results given below shows various test statistics i.e. within a dimension and between the dimensions.

5.3 Panel Long-Run Estimators

The fully modified OLS and dynamic OLS methods are used to check the long run association among variables. To check the long-run influence of military spending on external debt we apply FMOLS and DOLS. Pedroni (2000) suggested Fully Modified OLS and, Watson and Stock (1993) and Chiang and Kao (2000) suggested Dynamic OLS. According to Monte Carlo the DOLS test is better. The Chiang and Kao (2000) study restricted properties of OLS, Fully Modified OLS and Dynamic OLS. The study displayed that OLS significant bias presents in panel data where number of observation and time series is equal to sixty, the FMOLS cannot increase significant level over OLS. The DOLS is better from OLS and FMOLS.

6. Estimation of Results

In the first step, we applied panel unit root tests to notice that the variables are stationary or the variables are not stationary. In order to find out that whether data is stationary or not, we incorporated two tests in to our analysis of how variables affect external debt within a sample of six countries. Augmented Dickey Fuller ADF is applied over here in order to find the presence of unit root problem in a data. At level as shown in the Table 1, the common unit root test and individual unit root test and individual unit root test further uses ADF and PP test. The results of both test show that military expenditure and inflation are stationary at level.

Table 1: Panel Unit Root Tests at Level

Variable	Common Unit Root	Individual Unit Root	
		ADF-Fisher Chi-Square	PP-Fisher Chi-Square
LMEGDP	-2.46656 (0.0068)***	15.1680 (0.2324)	17.5001 (0.1317)
LINF	-1.57775 (0.0573)**	11.6038 (0.4780)	12.3476 (0.4182)
LER	3.90765 (1.0000)	4.21726 (0.9792)	4.01633 (0.9831)

LP	-0.70513 (0.2404)	18.7779 (0.0940)*	0.00034 (1.0000)
LNNI	5.37833 (1.0000)	0.17856 (1.0000)	0.01525 (1.0000)

***, **, * are significance level at 1%, 5% and 10% respectively. p-value is given in parenthesis.

The ADF and PP tests show that exchange rate, population and net national income are non-stationary at level. The results show that exchange rate, population and net national income is non-stationary (p=1) and the non-stationary results are not reliable because the non-stationary result are unpredictable and cannot be modeled or forecasted. That why, we move toward the panel unit root test at the first difference.

Table 2: Panel Unit Root test at first difference

Variable	Common Unit Root	Individual Unit Root	
		ADF-Fisher Chi-Square	PP-Fisher Chi-Square
LMEGDP	-3.66167 (0.0001)***	34.5472 (0.0006)***	57.5190 (0.0000)***
	-11.0551	114.570	165.379

LINF	(0.0000)***	(0.0000)***	(0.0000)***
	-5.67389	50.6640	76.8828
LER	(0.0000)***	(0.0000)***	(0.0000)***
	-3.05130	23.5301	26.4034
LP	(0.0011)***	(0.0235)***	(0.0094)***
	-3.65723	28.5164	58.3534
LNNI	(0.0001)***	(0.0046)***	(0.0000)***

***, **, * are significance level at 1%, 5% and 10% respectively. p-value is given in parenthesis.

The first difference test indicates that the data becomes stationary as p-values indicate. The military expenditure, exchange rate, population, net national income and inflation data p-values are now stationary in both ADF and PP test.

6.1 Panel Co-integration

We used panel co-integration within-dimension and between-dimension. The 'within dimension' examines the collective time period and it allows heterogeneity in across countries. The within-dimension contains four tests: panel v-statistics, panel rho-statistics, panel PP-statistics and panel ADF-statistics. The 'between dimensions' tests show the group mean co-integration are present and it allows for heterogeneity in parameters across countries. The between-dimension has group rho-statistic, group PP-Statistic and Group ADF-Statistic. The panel ADF statistics which based on within-dimension tests and between ADF tests is better (Pedroni, 2004). The Table 3 shows that within-dimension results show first two tests; panel v-statistic and panel rho-statistic are showing the insignificant results and panel PP-statistic and panel ADF-statistic are showing significant results. The results of between-dimension show that group rho-statistic are

insignificant and group PP-statistic and group ADF-statistic are significant.

Table 3: Panel Co-integration Statistic

(Within-Dimension)	Statistic	Prob.	(Between-Dimension)	Statistic	Prob.
Panel v-Statistic	-0.0606	0.5242	Group rho-Statistic	0.4043	0.6570
Panel rho-Statistic	-1.1094	0.1336	Group PP-Statistic	-3.8179	0.0001***
Panel PP-Statistic	-4.8710	0.000***	Group ADF-Statistic	-2.4145	0.007***
	-2.2819	0.011***			

Panel ADF- Statistic					
----------------------------	--	--	--	--	--

***, **, * shows level of significance at 1%, 5%, 10% respectively.

Table 4: Fully Modified Least Squares (FMOLS)

Variable	Coefficient	t-Statistic	Prob.
LMEGDP	-0.519981	-2.719813	0.0074***
LINF	-0.441394	-2.851099	0.0050***
LER	0.128065	0.639995	0.5233
LP	1.169871	4.757370	0.0000***
LNNI	0.353584	1.777929	0.0777*
C	-12.10190	-7.203192	0.0000***

***, **, * shows level of significance at 1%, 5%, 10% respectively.

This is the model specified for external debt as dependent and other five variables as independent. The p-value of military expenditure is significant at 1%. The military expenditure is showing the negative relationship with external debt. The 1% increase in military expenditure will decrease external debt by .5%. The p-value results show that inflation is significant at 1%. The inflation is revealed negative relationship with external debt. The 1% increase in inflation will decrease external debt by .4%. The p-value results show that exchange rate is insignificant and positive relationship with the external debt. The 1% increase in exchange rate will increase external debt by 12%. The above table has shown that the p-value of population is significant at 1%. The population shows positive relationship with external debt. The 1% increase in population will increase external debt by 1.2%. The table results explain that the p-value results show that net national income is significant at 10%. The net national income is revealed positive relationship with external debt. The 1% increase in net national income will increase external debt by 35%. The above results are for all variables used in this study i.e. external debt, military expenditure, inflation, exchange rate, population, net national income. All of the above results display that military expenditure and inflation have negative relationship with external debt while population exchange rate and net national income have a positive relationship with external debt. Same model specifications were used while analyzing the relationship among the variables with DOLS.

Table 5: Dynamic Least Square (DOLS)

Variable	Coefficient	t-Statistic	Prob.
LMEGDP	-0.414100	-2.132130	0.0351**
	-0.719507	-3.624457	0.0004***

LINF			
LER	-0.071186	-0.325052	0.7457
LP	0.958087	3.934786	0.0001***
LNNI	0.478684	2.443927	0.0160***
C	-9.853771	-5.739405	0.0000***

***, **, * shows level of significance at 1%, 5%, 10% respectively.

This is the model specified for external debt as dependent and other five variables military expenditure, inflation, exchange rate, population and net national income as independent. The p-value of military expenditure is significant at 5%. The military expenditure shows the negative relationship with external debt. The 1% increase in military expenditure will decrease external debt by 0.4%. The p-value result shows that inflation is significant at 1%. The inflation shows negative association with external debt. The 1% increase in inflation will decrease external debt by 0.7%. The above table had shown that the p-value result shows that exchange rate is insignificant and has negative association with external debt. The 1% increase in exchange rate will decrease external debt by 0.07%. The p-value of population is significant at 1%. The population shows positive relationship with external debt. The 1% increase in population will increase external debt by 0.9%. The p-value result shows that net national income is significant at 1%. The net national income shows positive relationship with external debt. The 1% increase in net national income will increase external debt by .4%. In the dynamic OLS method the

exchange rate relationship changes with external debt and other variable have the same nature of relationship.

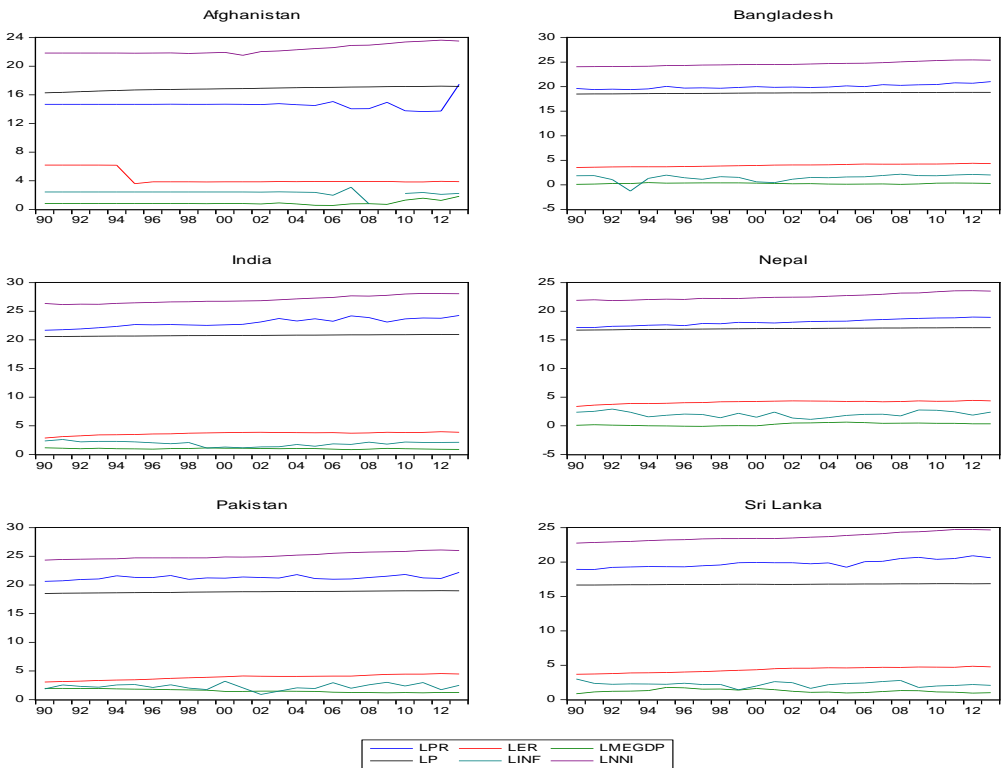
The above results are for all variables used in this study i.e. external debt, military expenditure, inflation, exchange rate, population, net national income. All of the above results display that military expenditure, exchange rate and inflation have negative relationship on external debt while population and net national income have shown the positive influence on external debt.

6.2 Countries Trend Analysis

The above graphs show the countries trend: Afghanistan graph shows that net national income and external debt showing the increasing trend but external debt increases faster in recent years. Exchange rate, population and inflation remain constant but inflation shows fluctuation after 2005. The military expenditure shows increasing trend in recent years. Afghanistan faces the Taliban issue that's why its economy is not in stable position. Bangladesh has religious extremism problem all minorities live under the fear that is the reason of rise the defense budget. The graph shows that in Bangladesh net national income and external debt show the slow increasing trend. The population, exchange rate and military expenditure are remaining constant and inflation shows the fluctuation. Nepal rises the defense expenditure due to monarchy struggles to crush the democratic in the country and Sri Lanka is facing the problem of liberation tigers of Tamil the both countries are showing the increasing trend in net national income and external debt. The defense expenditure, population and exchange rate are almost constant but inflation shows the fluctuation trend. Pakistan and India both are enemies of each other due to Kashmir issue. Both countries show the increasing trend in net national income, military expenditure and external debt, the exchange rate and population increase at constant rate. The inflation shows the fluctuation. Zamam *et al.*, (2012) found that in Bangladesh there is two-way statistical relationship present in real military spending and real external debt. The unidirectional causality relationship presents between military expenditure and external debt. Afghanistan

government is supported by the US and the Taliban are the problem in the country and it also effects the relationship with other countries. The region relationship between debt-defense is negative but previous studies showed that Pakistan and India have positive relationship between debt-defense. But other countries in this region like Afghanistan, Bangladesh, Nepal, Sri Lanka show that their military expenditure almost remains constant but external debt increases. So, the majority of the countries have negative relationship between debt-defense relationships.

Figure1: Countries Trend Analysis over a period of 1990-2013



Source: SIPRI and World Bank

7. Conclusion and Policy Recommendations

In this study, we have observed the defense-debt relationship among the six South Asian Economies: Pakistan, Bangladesh, Sri Lanka, Nepal, India and Afghanistan for the panel data of the time period 1990 to 2013. In our study we specified external debt as dependent variable and military expenditure, inflation, population, exchange rate and net national income as independent variables. In panel unit root tests, we used ADF and PP test at first difference the result shows that military expenditure, exchange rate, population, net national income and inflation are stationary. The panel co-integration test (panel ADF-statistic and group ADF-statistic) shows that there exists long run relationship between the desired variables. By employing Fully Modified OLS, and Dynamic OLS, the findings reported that military expenditure has negative relationship with external debt.

Military expenditure are the part of government expenditure so when gap between expenditure and income will reduce than military expenditure does not lead to increase in external debt.

References

- Brzoska, M. 1983. "Research Communication: The Military Related External Debt of Third World Countries". *Journal of Peace Research*, 20(3), 271-277.
- Chiang, M. H. and Kao, C. 2000. "On the Estimation and Inference of a Co-integrated Regression in Panel Data". *Advances in Econometrics*, 15, 179-222.
- Dunne, J. P., Freeman, S. P. and Soydan, A. 2004. "Military Expenditure And Debt In South America". *Defence and Peace Economics*, 15(2), 173-187.
- Dunne, P. and Freeman, P. S. 2001. "The Demand For Military Spending in Developing Countries". Paper presented to Second *Cesa/IDN International Conference on Defence Economics and Security in Mediterranean and Sub-Saharan Africa*, 1-20.
- Engle, R. F. and Granger, W. J. 1987. "Co-integration and Error Correction: Representation, Estimation and Testing". *Econometrica*, 55(2), 251-276.
- Georgantopoulos, A. G. and Tsamis, A. D. 2011. "The Interrelationship between Military Expenditure and External Debt: Patterns of Causation in Northern Africa Countries". *Journal of Economics and Behavioral Studies*, 3(4), 264-273.
- Karagol, E. 2006. "The Relationship Between External Debt, Defence Expenditures And GNP Revisited: The Case of Turkey". *Defence and Peace Economics*, 17(1), 47-57.
- Karagol, E. and Sezgin, S. 2004. "Do Defense Expenditures Increase Debt Rescheduling In Turkey? Probit Model Approach". *Defence and Peace Economics*, 15(5), 471-480.

- Lin, Chien-Fu., Levin, A. and Chia-Shang, J. C. 2002. "Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties". *Journal of Econometrics*, 108(1), 1–24.
- Muhanji, S. and Ojah, K. 2014. "External debt and military spending: the case of Africa's conflict countries". *Munich Personal RePEc Archive (MPRA)*, Paper No. 56077, posted 21, UTC, 22-49.
- Narayan, P. K. and Narayan, S. 2008. "Does Military Expenditure Determine Fiji's Exploding Debt Levels?". *Defence and Peace Economics*, 19(1), 77-87.
- Pedroni, P. 2000. "Fully Modified OLS for Heterogeneous Cointegrated Panels". *Advances in Econometrics*, 15(1), 93–130.
- Pedroni, P. 2004. "Panel Cointegration: Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to PPP Hypothesis: New Results". *Econometric Theory*, 20(3), 597–627.
- SIPRI (Stockholm International Peace Research Institute), 2013.
- Smyth, R. and Narayan, P. K. 2009. "A Panel Data Analysis of the Military Expenditure-External Debt Nexus: Evidence from Six Middle Eastern Countries". *Journal of Peace Research*, 46(2), 235-250.
- Wastson, M. W. and Stock, J. H. 1993. "A Simple Estimator of Cointegration Vectors in Higher Order Integrated Systems". *Econometrica*, 61 (4), 783-820.
- World Development Indicators (The World Bank 18 December, 2013).
- Zaman, K., Shah, I. A., Khan, M. M. and Ahmad, M. 2012. "Cointegration Analysis of the Economic Growth, Military

Expenditure, and External Debt: Evidence from Pakistan”. *Journal of Economics and Business Research*, 1, 91-117