The Demand for Defense Expenditures in Pakistan:
An Empirical Analysis

Asma Aslam[1], Muhammad Ramzan Sheikh[2], Asad Abbas[3], Salman Masood[4]

Abstract

This study has investigated the factors that influence the demand for defense expenditures in Pakistan. The study has employed Johansen-Julius cointegration technique by using the annual time series data for the period of 1972-2012. The results showed that the demand for defense spending in Pakistan is influenced by many factors like defense burden of India, War with India, atomic explosions, political stability and trade balance.

Key words: *Defense Expenditures, Pakistan, Johansen-Julius Cointegration*

INTRODUCTION

In common sense, defense expenditures are considered as most unwanted and adverse type of public expenditures. But why the different countries are allocating a major share of their budget for defense purposes. It is an appealing question that is to be probed especially in the case of Pakistan. Sheikh and Chaudhry (2013) claimed that Pakistan and India have hostile and aggressive relationships and none of the countries disregard their defense spending. The defense burden of a country is inevitable and it leads the resources of a country to be shifted from development projects (Anwar, et al., 2012). Smith (1980ab, 1995) lighted the way to delve into the various determinants of defense spending in neoclassical framework that focus the question in hand in a broader and comprehensive way.

The determinants of defense expenditures required to be understood particularly because of the significant role performed by defense expenditures in post-conflict circumstances. Defense expenditures are considered a deterrent for the enemies and potentially depress the economic growth of deprived and corrupt countries therefore better understanding of the determinants of defense expenditures has great importance and consequences.

---

[1] M.Phil Student, School of Economics, Bahauddin Zakariya University, Multan, Email: asmafiaz24@hotmail.com
[2] Lecturer, School of Economics, Bahauddin Zakariya University, Multan
[3] Lecturer, Department of Economics, COMSATS, Vehari Campus
[4] Ph.D Scholar, Superior University, Lahore

The world defense expenditures have increased up to the figure of $1.756 trillion in year 2012; this is equal to 2.5 percent of the total world GDP (SIPRI year book 2013). Due to strategic, political and economic significance of Pakistan in the region, defense expenditures debate has gained great importance. Pakistan is considered a developing country having position of 156th in world per capita purchasing power parity (PPP) adjusted gross national income of $ 2,600, Human Development Index (HDI) ranking 125th, peace ranking 145th and stands 35th in defense spending ranking.

Geopolitical hostilities and internal aggression also tend to manipulate defense spending. Other factors like technology, security, political resemblance and priorities, geography and history determine defense expenditures (Sahin and Muarat, 2010). Similarly, Collier and Hoeffler (2002a, 2002b) reported that both external and domestic threats affect the volume of defense expenditures. Other factors which they reported are the enhanced political power of the defense in non-democratic regimes, and the availability of financial resources to the government.

After getting the status of independent states in 1947, Pakistan and India are in a state of conflict and sharing antagonistic relationships. Various factors are contributing to increase the turmoil conditions in unfriendly environment of the two neighbouring countries in the South Asia. Social, economic, racial, political and religious differences are the main factors which affects the relationships of the both countries (Alexander, 1987; Deger and Sen, 1990; Ganguly, 1995, 1997 and Tibbett and Akram-Lodhi, 1997). Although both governments do not believe that these neighbouring countries are in an arms race but due to hostility, a considerable percentage of budget allocations are always kept for defense purposes (Tibbett and Akram-Lodhi, 1997).

The justification for the case study consideration of Pakistan is as firstly, Pakistan is situated in a most strategic part of South Asia which has facing a great level of instability and insecurity. Some researchers believe that Pakistan and India are in arms-race conditions (Dunne et al., 1999; ÖÖcal N, 2003; Jüülide Yildirim and ÖÖcal, N 2006).Secondly, Pakistan has internal and external security crises. Furthermore, after the nuclear explosions in 1998, Pakistan has become nuclear powers.

Pakistan has been spending an average 4.5 % of GDP on defense expenditures from 1995 to 2009. It is considered that these expenditures are due to arms race, territorial conflicts between India and Pakistan, Afghanistan conflict and internal wave of terrorism in Pakistan. This high ratio of defense expenditures and its impact on the economic growth and defense issues

have attained the researcher's attention from all over the world (Tahir and Sajid, 1999; Khilji and Mahmood, 1997; Henderson, 1993; Looney, 1998a; 1998b).

The basic aim of the defense expenditures analysis is to determine the availability of the resources for the defense expenditures and to find out the basic determinants of defense expenditures for a specific country. The defense expenditures depends on the two main parameters, first one is that how much is the specific country under threat conditions and how much that country can afford the security. Therefore, the defense expenditures are the combination of security and fiscal policies.

There is a wide range of literature available on the demand for defense expenditures, which defines defense determinants such as income, security conditions, internal and external threats, political conditions, geopolitical environment, population; regional defense spending and other measures of war threats (Smith, 1995).The determinants of defense expenditures in developing and developed countries are slightly different.

Empirical studies on defense expenditures determinants can be grouped into two broad categories. The first group focused on the arms race model considering comparative defense budget between two countries(Dunne, 1996: Smith 1989; Dunne et al., 2003, Kollias and Makrydakis, 1997) and the second fraction of empirical studies considered the internal(economic and politics) and external(security and strategic importance) factors and using neoclassical approach with formal models.

A lot of studies have been conducted on the determinants of defense expenditures for various countries and especially for developing countries (Alexander, 1987; Deger and Sen, 1990; Oren, I, 1994; Tahir, R, 1995; Ganguly, S,1995; Tibbett and Akram-Lodhi, 1997; ÖÖcal N, 2003; Jüülide Yildirim and Nadir ÖÖcal, 2006 Albalate, et al.2012) but a few studies have been conducted for Pakistan. Therefore, it is required to identify the determinants of defense expenditures and their share in defense expenditures of Pakistan. The aim of the study was to investigate the determinants of defense expenditures of Pakistan from 1972 to 2012. An attempt also was made to explore the insight into the trends and relation of various variables. The rest of the study is structured as: Section two gives the theoretical framework. Section three presents the review of empirical literature. Section four shows the trends of defense burden in Pakistan and India. In section five, model specification and methodology has been discussed. Section six has been allocated for the discussion of results. Finally in section seven conclusions and policy implications have been offered.

2. MODELS OF THE DEMAND FOR DEFENSE EXPENDITURES

The models for the demand for defense spending or determinants of defense spending can be categorized into three groups:

      i)   Defense Budgetary Process Approaches

      ii)   Arms Race Approaches

      iii)   Aggregate Defense Spending: General Approaches

Defense Budgetary Process Approaches

Defense budgetary process approaches are also called organizational politics models. In these models, various interest groups i.e. politicians, bureaucrats and arms industry focus their efforts for getting power so that they can achieve their own targets and objectives optimally. The amount of defense outlays or defense budget is the outcome of such efforts, optimization and competition. These approaches exhibit the short run determinants of defense spending plus kinds and scope of weapon growth (Isard and Anderton, 1988).

Arms Race Models

The second group of models to explore the determinants of defense spending is based on arms-race models. In these models, the level of one country's defense spending determines the rival's country defense spending. These models best explain the situations where an action-reaction process is characterized and countries have conflicts with each other. The seminal study on the arms-race phenomenon was proposed by Richardson (1960). Various variants and extensions of Richardson model have been suggested in the literature. Richardson model and its variants consider that the rival's country defense expenditures and various internal and external factors are the key determinants of a country's defense expenditures.

Aggregate Defense Spending: General Approaches

Various studies have been conducted on general approaches of aggregate defense spending [See Smith, 1980b, 1995; Dunne et al, 1984; Maizels and Nissanke 1986;Weede, 1986; McGuire, 1987; Ball, 1988; Rosh, 1988; Dommen and Maizels 1988; Looney,1989; Antonakis and Karavidas 1990; Deger and Sen 1990; Hewitt, 1991,1996; Kapopoulos and Lazaretou 1993; Kollias 1994,1996; Dunne and Mohammed, 1995; Antonakis 1995,1997a; Avramides, 1997; Sun and Yu 1999; Batchelor, et al. 2002; Yu 2002; Collier et al., 2002, 2003; Dunne and Perlo-Freeman 2003a and 2003b; Yildirim and Sezgin 2005; Tambudzai 2005, 2007; Dunne, Perlo Freeman and Smith 2008].

In these studies, the objective is to maximize the social welfare function subject to budget and security constraints. Different versions of social welfare function and constraints have been used in the empirical studies. Smith (1980,1995) presented the pioneer study to explore the potential determinants of defense spending in neoclassical framework.

3. REVIEW OF EMPIRICAL STUDIES

3.1 Economic and Strategic Determinants

Tambudzai (2007) discussed about the defense burden determinants in Southern Africa. The author used aggregate time series, cross section and pooled data estimation methods. The time period taken for this study was 1996 to 2005.The study provided an examination of the major determinants of defense expenditures for 12 members of the southern African development community. In this study OLS and GLS estimators were used. Most of the variables were significant at 5% level of significance. Variables like Wars, GDP per capita, the proportion of population in the army and the share of government expenditures in GDP were used under fixed effects model. The findings of the study suggested that both the economic and strategic variables are important in the determination of defense expenditures. Strategic variables are more important to affect defense burden than economic variables. Internal threats are also responsible for high defense expenditures. Dunne et al. (2011) studied the economic and strategic determinants of defense spending by using cross section and panel data analysis. Sample size was 80 and time period taken for the study was from 1988-2008. Different estimation techniques produced different results. The cross section analysis produced a positive effect of per capita income on the share of defense spending in GDP while the population had a negative effect. On the other side time series analysis gave opposite results. There was a clear difference between two approaches. Political and strategic variable's results were widely accepted. Heterogeneity across countries described the importance of both panel and modelling dynamic process. Spill over effect was not emerged important for this study. The results of the study suggested that democratic countries spend less on defense expenditures while countries at war spend more on defense. NATO member countries have higher defense expenditures.

Sheikh and Chaudhry (2012) studied about the major determinants of defense spending for Pakistan and India by using ARDL approach. Time period taken for this study was from 1972-2010. The study found out different economic, political and strategic factors as a determinant of defense ex-

penditures. The study proposed a result regarding economic determinants that RGDP and non-defense government expenditures positively related with defense spending of both the countries. Democracy index has a positive effect on Pakistan's defense spending while in India it has negative effect. Strategic factors have positive impact on defense expenditures of both countries. This study concluded with the result that both countries are indulged in an arm race due to hostility and aggression in their relation. There are also some internal threats which are responsible for the high defense spending. Demand for defense is a public good both for long run and short run.

Abdel Fattah et al. (2012) studied the economic and strategic factors for the demands of defense spending in Egypt. Egypt has a great role in the security of Middle East. It is involved in some regional disputes and changed its defense spending over time. So it is very interesting to study its defense expenditures. An empirical demand model was applied with co integration techniques (FMOLS, CCR, DOLS and JOHANSEN) which studied the Egyptian demand for defense expenditures taking into account the strategic and economic factors. Egyptian defense spending did not affected by the defense spending of its allies. The findings of the study suggested that both economic and strategic factors play an important role in determining defense burden and simple arms race relationships do not explain the strategic relationship as a whole.

Wang (2013) studied the demand of defense expenditures among different Southeast Asian countries since the end of the Cold War. The author used a dynamic panel approach and found that the defense expenditures in the region were due to economic, strategic and socio-political factors. Surging foreign debt burdens and the rise Of China were also important determinants along with other generalist variables. So there is a need of even-handed and region sensitive approach to study defense build ups. The study presented an advanced empirical examination of the determinants of defense spending among Southeast Asian countries in the post-Cold War period. A dynamic panel model was used to found that the determinants of defense budgets for the region comprises of GDP, foreign debt burden, security spill-in, perceived China threat, population and democracy. These variables have both short-term and even greater long-term effects. The findings of the study revealed that defense spending is jointly influenced by factors in economic, strategic and socio-political dimensions. There was a need to explore the rich effect of economic and socio-political factors as a determinant of defense expenditures. It was also found that how the financial crisis and the rise of china contributed to the process of defense build

ups in Southeast Asia.

3.2 Institutional and Political Determinants

Othman (2008) discussed about the major determinants of defense spending in sub Saharan African countries. It is the most conflict ridden region of the world. These conflicts are the main reason of its underdevelopment. There are several determinants of defense spending in sub Saharan region. Few of them are corruption, loot able assets, type of government, local ethno-political groupings. To measure the degree of democracy, the author used a ratings scale which is used by the freedom house. To measure the degree of corruption, the author used a transparency international perception index. Posner's ELF index is used to measure ethno political grouping variables. Defense expenditures per capita and a percentage of GDP were calculated. The purpose of this paper was to check out the real use of high defense expenditures by keeping in view the previous studies. There is no single theory which explains fully the reasons of defense expenditures in Africa.

Bel and Elias (2009) investigated the effect of institutional determinants like government form, electoral rules, and ideology on defense spending. Data taken for the study were from 1988-2006 and sample size was 157. OLS regression was used on pooled data. Some variables like press, GDP, system and per capita income were used. There is a possibility that in presence of plurality voting system defense burden will be reduced. Countries with a presidential democracy spend more on defense than their parliamentary counterparts. Different institutions have different impacts on public goods. The effect of institutional variables on defense spending enhanced the understanding of this issue.

Albalate et al. (2012) studied about the institutional determinants of defense spending like government form, democracy, electoral roles and concentration of parliamentary parties. Sample size was 157 and time period taken for this study was 1988 to 2006.OLS technique was used on pooled data. The findings of this study told that defense expenditures increased more in presidential democracy than in parliamentary system. On the other hand majoritarian electoral role decreased the defense burden.

The importance of institutional variable for the defense burden increased in post conflict situations .There are different type of political systems that can reduce the risk of war and defense spending. The literature predicted that democratic institutions produced the same result for all public goods but the regression results of this study were different from literature.

4. TRENDS OF DEFENSE BURDEN OF PAKISTAN

The overall average defense burden of Pakistan from 1972- 2010 is 0.051

friction of GDP. The maximum defence burden was observed in the year 1974. This shows that there was a great influence of 1974 atomic explosion of India. The minimum value was in the year 2008.

Figure 2 shows that defense burden of Pakistan remained so high on an average of 6.5% from year 1972 to 1980 and 6.1 % from year 1981 to 1990. This was the time when the defense burden was very high. But after 2000 a major decline started in defense expenditures. Again from year 2001 to 2003 the defense burden started to increase and then declined again. It seems that Pakistan received military aid from other countries after war on terror and that was the main reason to increase this spending. Policy formulation bodies and decision makers provide the explanation that there are different threats to Pakistan' security internally and externally that is the main reason for this high defense expenditures.

After the separation of Pakistan and India in 1947, a wave of enmity started between these two countries. These two countries have same institutional and Political structure but actually they have a lot of differences like diverse religious affiliations, alliances and foreign policies. It was recognized in the earlier years after the birth of Pakistan that India will not be a friendly neighbour and will pose a threat to Pakistan's sovereignty. Again In the regime of General Zia-ul-Haq in 1980's, the government rejected any suggestion to cut down military expenditures because it was considered that a nuclear submarine and jets with sticks was a sound defense. Therefore, they felt the need to match arsenal capabilities with our adversaries. So, a reduction in defense expenditures was not acceptable. As the security threat to Pakistan cannot be fixed. (Chawla, 2001). These security threats lead Pakistan and India to share hostile relations with each others and both fought four territorial wars.

An arms race was started between these two countries due to their hostile relations and this arms race set an adverse example for the rest of the world in recent times. So this arms race attracted a major chunk of their budgets. Hollist (1977) reported that the coefficients of retaliation were not clear in Richardson type arms race model for years 1948 to 1973.


Figure 4.2: Defense Burden of Pakistan
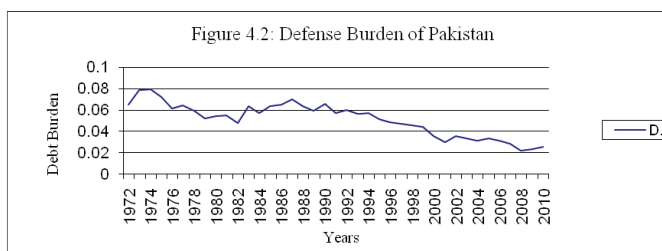
In 1979, the Soviet Union action in Afghanistan put a great effect on

Pakistan's security environment and it was emerged as a front line state in the war against communism. Pakistan cannot be escaped from the adverse situation due to its location on world's map which no other south Asian state has ever experienced. Pakistan again becomes a front-line state and non NATO ally of the United States in the War on terror in Afghanistan. Pakistan received aid for defense expenditures from The United States during both Afghan wars. The US support to Pakistan makes it confident to withstand Soviet pressure. Pakistan also tried to combat with Taliban and terrorist with US support.

The military interests of the ministry of defense are being protected by its organizational makeup. Military officials are serving in this ministry to control and monitor its functions according to the requirements of military establishment. The civilian establishment in this ministry have also enough influence to handle its affairs. (Siddiqah-Agha, 2000).

The trend of India's defence burden (DBI: military expenditure as a friction of GDP) is shown in Figure 3. The range of DBI is from 0.01 per cent to 0.029. The lowest point was at the start of 2007 as the more stability felling in Kashmir and Pakistan' s engagement in war against terror .In 2008, again rise in defense burden may be due to the incident of Mumbai attack. The highest point was in 1986 which was just after internal war in Punjab.

Figure 4.3: Defense Burden of India
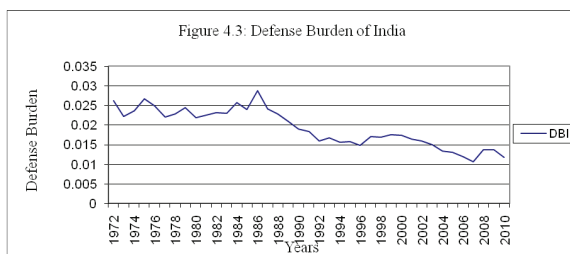
The defense burden raised 3 per cent in 1970 to 3.4 percent in 1971. This was slightly declining after the war, defense burden increased steadily at the start of 1990s. During the period 1991-97, the level of defense burden in India was under 0.02 frictions. Then the burden rose again in 1998 with the nuclear test and went back near to 0.02 friction of GDP in 1999 due to the Kargil conflict. From 2000 to 2010 Indian defense burden was fluctuating.

5. MODEL SPECIFICATION AND METHODOLOGY

a) Model Specification

We are employing the Neoclassical model to investigate the determinants of defense spending in Pakistan. For this, the dependant variable is defense burden of Pakistan and independent variables are defense burden of India, trade balance, democracy, atomic explosion of India in 1974 and 1998, and war.

$$DBP = \alpha_o + \alpha_1 DBI + \alpha_2 TB + \alpha_3 DM + \alpha_4 ATOMIC_{7498} + \alpha_5 WAR + \varepsilon \qquad (1)$$

Where α1, α2, α3, α4, α5 > 0

b) Data and Description of Variables

i) Sources of Data

Different sources have been used in this study to acquire data. Handbook of Statistics on Pakistan economy, World Development Indicators, SIPRI year book and Global Development Finance are the major sources. Data on defense expenditures, GDP and trade balance have been taken from Handbook of statistics on Pakistan economy. Data on defense expenditures of India have been taken from Handbook of statistics on Indian economy. $ATOMIC_{7498}$ and WAR have been used as dummy variables in this study to show the effect of internal and external threats. $ATOMIC_{7498}$ show the atomic explosion of India in 1974 and 1998 as a threat to Pakistan's security. WAR shows the war and war like situations.

ii) Description of Variables

DBP=Defense Burden of Pakistan (Real Defense Expenditures/RGDP)
DBI=Defense Burden of India (Real Defense Expenditures/RGDP)
TB=Trade Balance
DM= Democracy Index
$ATOMIC_{7498}$= Atomic threat to Pakistan from India's atomic explosions in 1974 & 1998.
WAR= Dummy variable for war or war like situations
The methodology of Johansen-Julius Cointegration has been applied to investigate the correlates of defense spending in Pakistan.

6. Empirical Results

6.1 ADF Test

First of all, unit root test has been conducted for all the variables. Therefore, Augmented Dickey Fuller (ADF) test has been applied to check the integration properties of the variables in the time series data as a first step. The mean and variance of the data must be same for the same period of time in order to accomplish the stationary characteristics.

Table 1: Unit Root Test

Test	Variables	Intercept	Lags	Trends	Lags	None	Lags	Co
At Level	DBP	-0.7562	1	-1.794	1	-2.1141	1	
	DBI	-1.2061	0	-2.3934	3	-1.4458	0	
	TB	-2.1229	0	-2.3368	0	0.0344	0	
At first Difference	DBP	-8.473	0	-8.2946	0	-7.941	0	
	DBI	-8.0725	0	-7.9816	0	-7.9396	0	
	TB	-5.8841	0	-5.8384	0	-5.9144	0	

Source: Authors' calculations

We have checked the stationary of three variables defense burden of Pakistan (DBP), defense burden of India (DBI) and trade balance. It is evident from Table 1 that all the variables are non-stationary in their level form and variables are changing to be stationary after taking the first difference. Johansen and Juselius cointegration test was conducted further as all the variables are at I(1). This test makes the study free of spurious regression.

6.2 Johansen-Julius Test for Cointegration

The results of ADF test suggest that as all the variables are on first difference, so we can apply the Johansen Julius cointegration test. Johansen conintegration test results are shown in Table 2 on the basis of two likelihood ratio test statistics of the Trace statistic (λtrace) and the Maximum Eigen (λmax) statistics which are most common in used to find out the number of cointegrating vectors in the study

Table 2: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.
None *	0.7748	131.54	117.708	0.0050
At most 1	0.6111	76.3727	88.8038	0.2802
At most 2	0.3398	41.4256	63.8761	0.7989
At most 3	0.2947	26.081	42.9192	0.7342
At most 4	0.1859	13.1391	25.8721	0.7273
At most 5	0.1387	5.5254	12.5179	0.5228

Source: Authors' Calculations

It is a confirmation of cointegration between the variables and also sign of a long-run correlation between the dependent variable defense burden of Pakistan (DBP) and independent variables – defense burden of India (DBI), Trade balance (TB), democracy (DM), atomic explosion (ATOMIC7498) and war situation (WAR). The cointegration test was conducted for the series as they are integrated at first difference or integrated of first order I(1). The first column in Table 2 shows the hypothesized values, second column illustrate the Eigen values. Third column demonstrate the trace statistics, next column shows the critical values based on Mackinnon-Haug-Michelis (1999) of traces. Last column shows the probability of these values. Trace test indicate one cointegrating equation at the 0.05 level. The first value of trace statistics is 131.54 which is greater than trace critical 117.708. After that trace statistics is less than the critical value as in the second row the trace statistics is 76.3727 which is less than trace critical 88.8038 and so on. The first equation shows the one cointegrating value. Linear deterministic trend was assumed in this test. The trace (λtrace) statistics criterion shows that at most one cointegrating vector exists.

Another criterion i.e. the Maximum–Eigen statistic test confirms the null

hypothesis rejection at 5 per cent levels. Table 3 shows that the results of the unrestricted co-integration rank test. The results verify the long run significant relationship between the variables.

Table 3: Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistics	0.05 Critical Value	Prob.
None *	0.7748	55.1710	44.4972	0.0025
At most 1	0.6111	34.9470	38.3310	0.1164
At most 2	0.3398	15.3675	32.1183	0.9360
At most 3	0.2947	12.9190	25.8232	0.8097
At most 4	0.1859	7.6136	19.3870	0.8546
At most 5	0.1387	5.5254	12.5179	0.5228

Source: Authors' calculations

The first column in Table 3 shows the number of cointegrating equations. Second column shows the Eigen value while the third column exhibits the Max-Eigen statistics. Fourth column shows the critical values at 5% level of confidence. Fifth column shows MacKinnon-Haug-Michelis (1999) p-values. First value of Max-Eigen value is 55.1710 which is greater than the critical value 44.49772. So max Eigen value test also indicates one cointegrating equation at 0.05 level. These two values show the rejection of hypothesis at 5% level.

6.3 The Long Run Analysis

The empirical results of equation 1 are presented in Table 4 which exhibits the long run relationship of DBP with DBI, TB, DM, ATOMIC98 and WAR. The results of some variables are according to our prior expectations. The results show that all the parameters of the variables i.e. defense burden of India (DBI), trade burden (TB), democracy (DM), atomic explosion (ATOMIC7498) and war situation (WAR) have positive sign.

The variable defense burden of India (DBI) shows the positive relationship with defense burden of Pakistan (DBP). This result is according to our prior expectation. It was expected that DBP and DBI go in the same direction. If India raises its defense expenditures, it compelled Pakistan to increase its defense expenditures as Pakistan and India hardly enjoyed friendly relationship since 1947. The coefficient of DBI shows the positive sign.

Table 4: Long Run Results

Explanatory Variables	Coefficient	Standard errors	t-statistic
DBI	3.8032	5.4497	0.6978
TB	0.1155	0.0807	1.4311
DM	7744.18	1746.37	4.4344
ATOMIC$_{7498}$	1.0809	0.1877	5.7584
WAR	0.0575	0.0613	0.9373
C	0.3328	––	––

Source: Authors' calculations

The reason of positive sign may be that Pakistan is responding to Indian defense expenditures due to hostility and rivalry between the countries. Interestingly, the parameter of DBI is insignificant. In fact this result show that Indian defense expenditures would not be more important for Pakistan in the long run because as Pakistan would get more arms and deterrence, she would not spend on defense in retaliation of Indian defense spending.

In other words, Pakistan can follow the pattern of Indian defense strategy and can increase its defense expenditures. Moreover, Pakistan will follow its own state of affairs or internal factors rather than just to see the Indian defense expenditures in long run.

The next variable is the trade balance (TB). The coefficient of estimated variable is positive which is according to our expectations. The positive impact of the trade balance on defense expenditures may be due to the reason that when a country becomes more open then she can arrange more funds to buy more arms. So an increase in trade balance leads to increase in defense expenditures. These results are in accordance with [Dunne and Perlo Freeman, 2003; Rosh, 1988; Dunne and Mohammed, 1995; Dunne, Perlo Freeman and Smith, 2008].

The third variable is democracy (DM). According to our expectations the relationship of democracy with the defense expenditures is negative. If government is less democratic then it will rely more on defense expenditures to combat the higher level of risk (Collier and Hoeffler, 2002). The percentage of GDP to be spent on defense will be higher in a dictatorial society than a fully democratic society. The result of variable democracy in our estimated model is positive. The estimated parameter of democracy index for Pakistan is significant and positive because in Pakistan, military regime remained in power for most of the time. So, defense expenditures are always high since its inception. Our results are attuned with the studies [Sheikh and Chaudhry 2012, Maizels and Nissanke, 1986, Hewitt, 1996; and Dommen and Maizels, 1988]. Defense expenditures are determined by military rule which are shown in these studies.

ATOMIC7498 is the next variable in our estimated equation. The coefficient of Atomic7498 is positive. After the atomic explosion of 1974 and 1998 in India, Pakistan increased its defense expenditures. Pakistan launched its nuclear program in 70s and successfully completed it in 1998 with an atomic explosion. This leads to immense increase in defense expenditures of Pakistan.

The next variable in Table 4 is WAR which is used for war or war like situations. It is obvious from the literature on determinants of defense

expenditures that in war or war like situations increase the defense expenditures increases manifold. So, the result of this parameter is according to our expectations.

6.4. Error Correction Analysis (Stability Condition)

The error correction term shows how quickly the adjustment of variables takes place to restore the equilibrium in the dynamic model. Table 5 shows the stability analysis where dependant variable is defense burden of Pakistan and independent variable are defense burden of India, trade balance, democracy, Atomic threat and War.

Table 5: Results of Stability Condition

Variables	C.I vector	E.C coefficient.	C.I coefficient*E.C coefficient.	Remarks
DBP	1	0.0214	0.02143	Significant
DBI	-3.8032	-0.0023	-0.00894	Insignificant
BT	-0.1155	-0.0742	0.00858	Insignificant
DM	-7744.18	**2.42E-05**	**-0.18741**	**Significant**
ATOMIC$_{7498}$	-1.0809	0.4193	-0.45327	Significant
WAR	-0.0575	-0.6915	0.0397	Insignificant
			-0.56192	

Source: Authors' calculations

Column 1 of Table 5 shows the dependant and independent variables. Column 2 shows the cointegrating vectors. Column 3 shows the error correction coefficients. Last column shows the significance of these variables. Stability condition is used to analyse the error correction mechanism. The necessary condition of Stability condition is that the sum of the product of cointegrating coefficient and error correction coefficient must be negative. This is satisfied in our case. The sufficient condition of stability condition is that the individual product of cointegrating coefficients and error correction coefficient be negative. The variable DM is showing negative sign and it is significant as well so, if any discrepancy occurs in the long run in the model, it would be corrected by DM. The variable War is also showing negative sign but it is insignificant in our case. TB is significant but showing positive sign. ATOMIC$_{7498}$ is depicting positive sign and it is insignificant.

7. Conclusion and Policy Implications

This study has been planned to investigate the determinants of defense expenditures for Pakistan. We have used the time series data from 1972 to 2012. The Johansen Juselius test was applied to get the empirical results. The results of the study show that all the variables like defense burden of India (DBI), trade balance (TB), democracy (DM), Atomic7498, and WAR have a positive relation with defense expenditures of Pakistan. These variables are responsible for the increase in DBP. Stability condition shows that a discrepancy in the model will be corrected by DM.

The following policies have been recommended on the basis of analysis:

- The government can increase its trade balance along with the development projects.
- The government can encourage the trade of goods and services instead of trade of arms.
- Political and judicial institutions should try to strengthen the democracy and military rules should be discouraged.
- Nuclear weapons race should be dispirited to shift the resources towards the developments projects.
- Regional conflicts should be resolved so that dream of regional peace and stability can be changed in to reality and war situation can be avoided.

References

Abdel Fattah, M. Y. AbuQarn, S. A. Dunne, J. (2012). The Demand for Military Spending in Egypt. Department of Economics. Ben-Gurion University of the Negev. Working paper 1210

Albalate, D. Bel, G. Elias, F. (2012). Institutional Determinants of Military Spending. Journal of comparative economics, 40(2), 279 -290.

Alexander, D. L. (1987). Security profile: India vs. Pakistan. Harvard International Review, 9, 39–41.

Antonakis, N. & Karavidas, D. (1990). Defence Expenditure and Growth in LDCs. The Case of Greece, 1950-1985. Discussion Paper, Centre of Planning and Economic Research, Athens.

Antonakis, N. (1995). The Economic Effects of Indigenous Arms Production in Greece: A Comment and Further Empirical Evidence. Spoudai, 45(3-4), 87-102.

Antonakis, N. (1997). Military Expenditure and Economic Growth in Greece, 1960- 90. Journal of Peace Research, 34 (1), 89-100.

Anwar,Z.F., Rafique,Z.,& Azam,J.S. (2012) Defense Spending-Economic Growth Nexus: A Case Study Of Pakistan Pakistan Economic and Social Review,50 (2) 163-182.

Avramides, C. (1997). Alternative Models of Greek Defence Expenditures. Defence and Peace Economics, 8, 145-187.

Ball, N. (1988). Security and Economy in the Third World. London: Adamantine Press Limited.

Bel, G. Elias-Moreno, F. (2009). Institutional determinants of military spending. Research Institute of Applied Economics, 22, 1-32.

Brito, D. & Intriligator, M. (1995). Arms Races and Proliferation, in Hartley, K. & Sandler, T. (eds), Handbook of Defence Economics, Vol. 1, Elsevier: Amsterdam.

Chawla, Shalini (2001), Pakistan's military spending: Socio-economic dimensions. Strategic Analysis, 25(5) 703-716.

Collier, P. and Hoeffler, A. (2002a). Military Expenditure: Threats, Aid and Arms Races. World Bank Policy Research Working Paper 2927, Washington

Collier, P. and Hoeffler,A (2002b), Greed and Grievance in Civil War, WPS 2002-01, Centre for the Study of African Economies, Working Paper,

Collier, P.& Hoeffler, A.(2007). Unintended Consequences: Does Aid Promote College Economic Journal, 32(1&2), 27-39.

Collier, P., Hoeffler, A., Elliot, L., Hegre, H., Reynal-Querol, M. and Sambanis, N. (2003). Breaking the Conflict Trap: Civil War and Development Policy. Washington, DC and New York : Oxford University Press and the World Bank.

Deger, S. and Sen, S. (1990). Military Security and the Economy: Defence Expenditure in India and Pakistan, Ch. 9 in Hartley & Sandler (ed), The Economics of Defence Spending, Routledge, London, pp. 189-227

Dommen, E. and Maizels, A. (1988). The Military Burden in Developing Countries. The Journal of Modern African Studies, 26 (3), 377-401.

Dunne, P. & Smith R. (1984). The Economic Consequences of Reduced UK Military Expenditure. Cambridge Journal of Economics, 8 (3), 297-310.

Dunne, P. J. and Mohammad, L. A. N (1995). Military spending in sub Saharan Africa: some evidence for 1967-1985. Journal of Peace Research, 32(3), 331-343.

Dunne, P. J. Nikolaidou, E. Mylonidis, N.(2003). The Demand for Military Spending in the Peripheral Economies of Europe. Defence And Peace Economics. 14(6), 447-460.

Dunne, P., Nikolaidou, E. & Smith, R. (1999). Arms Race Models and Econometric Applications, Forthcoming in Levine, P., Sen, S. & Smith, R. (eds) (2000), The Arms Trade, Security and Conflict, Harwood Academic Publishers.

Dunne, P., Perlo Freeman, S. and Smith, R. (2008). The Demand for Military Expenditure in Developing Countries: Hostility versus Capability. Defence and Peace Economics, 19 (4), 293 - 302.

Dunne, P.J and Freeman, P.S (2003 b).The demand for Military Spending in developing countries: A Dynamic Panel Analysis. Defence and Peace Economics, 14(6),461–474.

Dunne. P. J., Freeman. P.S., Smith. P.R. (2011).Determining Military Expenditure: Dynamics, Spill Over and Heterogeneity in Panel Data. Economic society South Africa conference: university of Stellenbosch.

Gadea, D. M. Pardos, E.Fornies, P. C (2004). A long□run analysis of defence spending in the NATO countries (1960–99), Defence and Peace Economics, 15(3), 231-249.

Ganguly, S . (1995). Wars without end: The Indo Pakistani conflict. Annals, AAPSS, 541, 167–178.

Georgiou, G. (1990). Is There an Arms-Race between Greece and Turkey? Some Preliminary Econometric Results. Cyprus Journal of Economics, 3 (1), 58-73.

Georgiou, G., Kapopoulos, P. and Lazaretou, S. (1996). Modelling Greek-Turkish Rivalry: An Empirical Investigation of Defence Spending Dynamics. Journal of Peace Research, 33 (2), 229-239.

Hartley, T. and B. Russett. (1992). Public Opinion and the Common Defense: Who Governs Military Spending in the United States? American Political Science Review, 86 (4), 905-915.

Hewitt, D. (1996). Military Expenditures 1972-1990: The Reasons Behind The Post-1985 Fall In World Military Spending. Public Budgeting and Financial Management, 7 (4), 520- 558.

Hewitt, D. P. (1991). Military Expenditure: Econometric Testing of Economic and Political Influences. IMF Working Paper, WP/91/53, IMF: Washington DC.

Hollist, L, W. (1977). An Analysis of Arms Processes in the United States and the Soviet Union. International Studies Quarterly, Vol. 21, No. 3, pp. 503-528.

Isard, W. and C.H. Anderton. (1988). A Survey of Anns Race Models. In W. Isard, Arms Races, Arms Control and Conflict Analysis (pp. 17-85). Cambridge: Cambridge University Press

Johansen, S and K. Juselius. (1990). Some Structural Hypotheses in a Multivariate Cointegration Analysis of the Purchasing Power Parity and the Uncovered Interest Parity for UK. Discussion Papers 89-11. University of Copenhagen. Department of Economics.

Jüülide Yildirim and Nadir ÖÖcal (2006). Arms Race And Economic Growth: The Case of India And Pakistan. Defence and Peace Economics, 17(1), 37–45.

Jüülide Yildirim and Nadir ÖÖcal (2006). Arms Race And Economic Growth: The Case of India And Pakistan. Defence and Peace Economics, 17(1), 37–45.

Kapopoulos, P. & Lazaretou, S. (1993). Modelling the Demand for Greek Defence Expenditure: An Error Correction Approach. Cyprus Journal of Economics, 6 (1), 73-85.

Kollias, C. (1991). Greece and Turkey: The Case Study of an Arms Race from the Greek Perspective. Spoudai, 41(1), 64-81.

Kollias, C. (1994). Is There a Greek-Turkish Arms-Race? The View from Athens. Cyprus Journal of Economics, 7 (1), 52-62.

Kollias, C. (1996).The Greek-Turkish Conflict and Greek Military Expenditure, 1960-92. Journal of Peace Research, 33 (2), 217-228.

Kollias, C. and Makrydakis, S. (1997b). Is there a Greek-Turkish arms-race? Evidence from cointegration and causality tests. Defence and Peace Economics, 8, 355-379.

Looney, R. (1989). Internal and External Factors in Effecting Third World Military Expenditures. Journal of Peace Research, 26 (1), 33-46.

Lucier, C. E. (1979). Changes in the Values of Arms Race Parameters. Journal of Conflict Resolution, 23 (1), 17-39.

Mackinnon, J. G., Alfred A. Haug, and Leo Michelis. , (1999). Numerical Distribution Functions of Likelihood Ratio Test for Cointegration, Journal of Applied Econometric. 14: 563-577

Majeski, S. (1983). Mathematical Models of the U. S. Miltary Expenditure Decision Making Processes. American Journal ofPolitical Science, 27, 485-514.

Majeski, S. and Jones, D. (1981). Arms-Race Modelling: Causality Analysis and Model Specification. Journal of Conflict Resolution, 25 (2), pp. 259-288

McGuire, M. C. (1965). Secrecy and the Arms Race. Cambridge: MA: Harvard University Press.

McGuire, M. C. (1987). US Foreign Assistance, Israeli Resource Allocation, and the Arms race in the Middle East, in: C. Schmidt, ed, The Economics of Military expenditures (Macmillan for International Economic Association , London) 197-238.

Nikolaidou, E. (2008). The Demand for Military Expenditure: Evidence from the Eu15 (1961-2005).Defence and peace economics, 19(4), 273-292.

Nordhaus, W. Oneal, R.J. Russet, B. (2009). The Effects of the Security Environment on Military Expenditures: Pooled Analysis of 165 Countries, 1950-2000. Cowles Foundation Paper No 1707, Yale University

Öcal, N. (2003). Are the Military Expenditures of India and Pakistan External Determinants for Each Other: An Empirical Investigation. Defence and Peace Economics, 14, 141 - 149.

Oren, I. (1994). The Indo-Pakistan Arms Competition: A Deductive and Statistical Analysis. The Journal of Conflict Resolution, 38(2),185-214.

Ostrom, C.W. and Marra, R.F. (1986). US Defense Spending and the Soviet Estimate. American Political Science Review, 80, 819-842.

Othman, R. (2008). Determinants of military spending in Sub Saharan African countries. Political science 499, section 99.

Rattinger, H. (1975). Armaments, Detente, and Bureaucracy. Journal of Conflict Resolution, 19 (4), 571-595.

Refenes, A. N., Kollias, C. & Zapranis, A. (1995). External Security Determinants of Greek Military Expenditure: An Empirical Investigation using Neural Networks. Defence and Peace Economics, 6, pp. 27-41.

Richardson, L. F. (1960). Arms and Insecurity: A Mathematical Study of Causes and Origins of War. Pittsburgh: Boxwood Press.

Rosh, R. (1988). Third World Militarization: Security Webs and the States They Ensure. Journal of Conflict Resolution, 32 (4), 671-698.

Sahin Afsin and Murat Cetinkaya (2010). New Evidence for Turkey on the Relationship between Defense Spending and Aggregate output, European Journal of Social Sciences, 13(3), 436-460.

Sheikh, R. M. and Chauhdry, S. I. (2013).The determinants of defence expenditure in Pakistan and India: an ARDL bound testing approach. Pakistan Journal of Social sciences, 32(2),525-549.

Siddiqa-Agha, Ayesha (2000), Defence a public good? A case study of Pakistan's military expenditure, 1982-99. In P. R. Chari and Ayesha Siddiqa-Agha, Defence Expenditure in South Asia, India and Pakistan. Regional Centre for Strategic Studies.

Smith, R. (1980a). Military Expenditure and Investment in OECD Countries 1954-1973. Journal of Comparative Economics, 4 (1), 19-32.

Smith, R. (1980b). The Demand for Military Expenditure. Economic Journal, 90, 811-820.

Smith, R. (1989). Models of Military Expenditure. Journal of Applied Econometrics, 4 (4), 345-359.

Smith, R. (1995). The Demand for Military Expenditure. Ch. 4 in Hartley, K. & Sandler, T. Handbook of Defence Economics, Elsevier

Solomon, B. (2005). The demand for Canadian defence expenditures, Defence and Peace Economics, 16(3), 171-189.

Sun,Q. and Yu,Q. (1999). Determinants of China's Military Expenditures: 1965-93. Journal of Peace Research, 36, 23-33.

Tahir, Rizwan (1995). Defence Spending and Economic Growth: Re-examining the Issue of Causality for Pakistan and India. The Pakistan Development Review, 34 : 4 1109-1117.

Tahir, Rizwan and G. M. Sajid (1999), Defence spending and economic growth in less developed countries: Re-examining the issue of causality. Government College Economic Journal, 32(1&2), 27-39.

Tambudzai, Z. (2005). Determinants of Zimbabwe's Military Expenditure, 1980-2003. The Biennial Conference of the Economic Society of South Africa (ESSA). Durbanm, South Africa.

Tambudzai, Z. (2007). Military Burden Determinants in Southern Africa, 1996- 2005: A Cross-section and Panel Data Analysis. Economic Development in Africa Conference. Oxford: St Catherine's College. Reference no 76

Tambudzai, Z. (2007). Military Burden Determinants in Southern Africa, 1996-2005: A Cross-section and Panel Data Analysis. Economic Development in Africa Conference. Oxford: St Catherine's College.

Tibbett, J. S. and Akram-Lodhi, A. H. (1997). Militarization and maldevelopment: The India-Pakistan arms race. Scandinavian Journal of Development Alternatives and Area Studies, 16, 157–182.

Wang, Y. (2013).Determinants of Southeast Asian military spending in the post-cold war era: a dynamic panel analysis. Defence and peace economics, 24(1), 73-87.

Wolfson, M. (1968). A Mathematical Model of the Cold War. Peace Research Society, 9, 107-123.

Yildirim, J & Ocal,N. (2006). Arms race and economic growth, a case of India and Pakistan, Defence and Peace Economics, 17(1), 37-45.

Yildirim, J. and Sezgin, S. (2005). Democracy and Military Expenditure: A Cross-Country Evidence. Transition Studies Review, 12 (1), 93-100.

Yu, M. (2002). The Impact of US-China Relations on Taiwan's MIlitary Spending: An Analytical Model of Error Correction Mechanism. APSA's Annual Meeting. Boston.