

## MILITARY EXPENDITURE AND POVERTY IN PAKISTAN

### **Military expenditure and poverty in Pakistan: a complex phenomenon**

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## ABSTRACT

This article investigates the impact of military expenditures on poverty along with inflation, industrialization, service sector, and foreign direct investment for both long term and short term. An effort is made to find out the role of military expenditure in poverty elimination. The question to be addressed is that whether military expenditure is pro-poverty or anti-poverty in Pakistan. A time series analysis is made for the period of 1972-2009. The problem of unit root is inspected by applying Ng – Perron (2001) test; the strength of relationship between military expenditures and poverty in the light of control variables is investigated by using Johansen and Juselius (1990), the long term coefficients are examined by using Ordinary Least Square Method and short term dynamics are computed by applying Error Correction Mechanism. The results show that military expenditures and inflation are significantly elevating poverty in both long term and short term analysis while the growth of industrial and service sectors help in reducing poverty in Pakistan.

**Keywords:** Pakistan; Military Expenditures, Poverty, Inflation, Industrialization, Service Sector, and Foreign Direct Investment.

## 1. INTRODUCTION

The volume of military expenditure depends on the geographical, political and strategic position of the country on the map. Geopolitical hostilities and domestic violence tend to affect defense expenditure. Other factors like security, technology, political affinity and priorities, geography and history determine defense expenditure (Sahin and Muarat, 2010). Countries surrounded with threats cannot ignore military expenditure no matter what the stage of their development is. Collier and Hoeffler (2002a, 2002b) find that both external and internal threats influence the volume of military expenditure. Other factors pointed out by them are the enhanced political power of the military in non-democratic regimes, and the availability of financial resources to the government.

The developing countries are rooted with poverty and heavy expenditure on military raises serious reservations in these countries. For example the South Asia is the most militarized region (Hussain, 2001) despite the fact that poverty is pervasive in the region. The arm race in India and Pakistan is like a never ending struggle. India is ranked number one in the world by the World Bank in terms of arms imports while Pakistan is ranked number 10<sup>th</sup> in the world in terms of arm imports.

Pakistan had to build a strong military base since its Independence mainly due to her strategic geographical situation. The disputed territory of Kashmir led Pakistan to face three wars with India. Consequently Pakistan has to spend a larger share of GDP on defense. For example, the defense expenditure as a percentage of GDP was 18.1% and 13.0% in 2001 and 2008 respectively (Pakistan Economic Survey 2009-2010). The military expenditure is justified on the basis of providing “National Security” to the country.

From economic front Pakistan is ranked 145 out of 187 countries and territories by the UNDP (2011) in terms of Human Development Index. The multidimensional

poverty index MPI (that was introduced in 2010) indicates multiple deprivations in the same households in education, health and standard of living. According to the UNPD report (2011) 49.4% of population in Pakistan suffers multiple deprivations while an additional 11.0% is vulnerable to multiple deprivations.

One of the biggest challenges is to reallocate the resources from military expenditure to social development in order to reduce poverty, hunger and preventable diseases. An interesting question arises how a developing country like Pakistan where masses are subject to absolute poverty can afford such a heavy expenditure on defense? What impact the military expenditure exert on poverty? Is the military expenditure pro poverty or anti poverty?

The paper examines the extent to which military expenditure is linked with poverty in Pakistan for the period 1972-2009. It is hypothesized that military expenditure is positively associated with poverty.

As customary the paper is organized into different sections. Section 11 discusses the arguments given in literature for the military expenditure. Section 111 highlights some facts related to poverty and military expenditure in Pakistan. Section 1V narrates methodology, and data selection along with the development of a model to estimate the relationship between poverty and military expenditure and some other key macro factors affecting poverty. Section V discusses the results. Finally, Section VI concludes the major findings of the paper and suggests some policy implications.

## 11. Literature Review

The literature is enriched with studies focusing on defense expenditure from different perspectives. Two thoughts are dominant in the literature. Some believe that the military expenditure has very strong positive relationship with the growth of the economy. Others argue that military expenditure is negatively related to the growth of the economy.

Wolf (1981) opines that the military expenditure may stimulate technological progress and transfers and enhances industrial production. Fredericksen and Looney (1983) in their study show a positive relationship between defense expenditure and economic growth. Other studies suggesting a positive relationship between defense expenditure and economic growth are: (Atesoglu 2002, 2004; Dunne, Freeman and Soydan, 2002; Narayan and Singh, 2007; Pieroni and Giorgio et al. 2008; and Guillou, and Lozaric, et al. 2009). Aizenman and Reuven, 2006 estimated the growth equations for a cross-sections of countries for the period 1989-98 and identified the presence of non-linear interaction between threats and military expenditure. They argued that in the presence of threats a larger share of military expenditure to GDP increases growth (Aizenman and Reuven, 2006). By taking the sample of 71 developing countries Landau (1983) tested the impact on growth of military expenditure and found a positive relationship between these two.

Some studies argue that a nonlinear relationship between military expenditure and economic growth exists and if ignored leads to misspecification of the models resulting in biased empirical results (Aiezenman and Reuven, 2006; Dunne and Freeman, 2003). The relationship between military expenditure and economic growth has been found negative in advanced economies through its effect on investment (Smith, 1980). For developing countries the likely impact of military expenditure on economic growth is also Negative (Dunne, 1996).

The military expenditure is also associated with the industrial production of the economy. The relationship between military expenditure and industrial production was tested by Sahin and Murat (2010) in the case of Turkey. They applied econometric techniques by using monthly data for January, 2004-December, 2008 and found a positive relationship between industrial production and defense expenditure (Sahin and Murat, 2010).

The relationship between military expenditure and savings has been tested by Looney (1989) and little evidence was found that military expenditures have reduced the savings below its already low level in Pakistan.

Another very important aspect; the reallocation of the public expenditure from military to social purpose was considered in some studies. A survey by the International Monetary Fund (1999) showed that reductions in military spending in some countries have been accompanied by increased public expenditure on health and education.

A nation with dire need to spend a higher proportion of public expenditure on education and health in fact trades off the poverty and military expenditure. The relationship between military expenditure and poverty is a complex one and other macroeconomic variables like economic growth and unemployment affect it (Henderson, 1998).

Poverty is affected by many macroeconomic variables. Earlier many researches have been conducted in finding the relationship between poverty and key factors affecting it. For example, the trade is identified as an important factor reducing poverty in case of Pakistan (Winter et al. 2004; Gilbert 2008; and Hassan and Wasif 2010). Kalim and Shahbaz (2009) identified remittances, trade openness, gdp growth, inflation and urbanization and FDI as important determinants of poverty in Pakistan.

The literature review suggests that no study has been done yet to explore the relationship between the military expenditure and poverty in Pakistan. The present paper touches this very important aspect to understand the nature and strength of the relationship between poverty and military expenditure in Pakistan. Further the impact of industrial and service sector growth on poverty has not been explored in any of the earlier studies and will be investigated in the present paper.

### 111. Pakistan Military Expenditure and Poverty: An Overview

Pakistan is ranked 9<sup>th</sup> among 117 countries in terms of military expenditure. The defense expenditure in Pakistan has remained the largest component of GDP throughout the history of Pakistan. Despite a slight decline in defense expenditure since

the last decade the absolute size of the defense expenditure is still considered very high. Defense expenditure has the potential to rise sharply if tensions between the Pakistan and India are exacerbated. In FY2002, for example, defense spending was higher than anticipated (Rs. 151.6 billion as against the targeted Rs. 131.6 billion) as a result of the military standoff with India. The military expenditure as a percentage of total expenditure has been on average around the figure of 15.0. By the end of June 2010, the defense expenditure was expected to increase by Rupee 130 billion mainly because of the military operation against the militants and the increase in the salaries of military personnel.

According to the door-door survey carried out by Benazir Income Support Programme (BISP), 45.7% of the entire population is living under the poverty line (<http://tribune.com.pk/story/495045/laid-to-rest-hawaid-police-sho-imam-hassan-dies-in-hospital/>). Another report suggests that every third Pakistani is caught in the “poor bracket” and some 58.7 million out of total population of 180 million fall below the poverty line <http://dawn.com/2012/09/26/poverty-in-pakistan-2/>).

The official records however underestimate the poverty figures. The report prepared by the Pakistan Social and Living Standards Measurement (PSLM) Survey 2010-2011 indicate the fall of incidence of poverty from 17.2% in 2008 to slightly over 12% in 2011. Experts however believe that a drop in poverty is impossible with the fact that there is average job growth of 2.6% for the last four years and against the requirement of 8% and inflation has stayed in double-digits for the fifth consecutive years (<http://tribune.com.pk/story/495045/laid-to-rest-hawaid-police-sho-imam-hassan-dies-in-hospital/>).

Poverty in Pakistan is attributable to a number of factors like, sluggish GDP growth, low level of investment, poor governance, declining public development expenditure, debt burden etc. Other plausible reasons of Poverty are the low level of education, poor health facilities, job in informal sector, low access to infrastructure and the like. Education and health are the most neglected sectors in Pakistan. Study by Arif, et,al

2001 indicates that those households whose heads had no formal education had about three times the incidence of poverty compared to those households whose heads had completed 10 years or more of schooling

To provide a relief to the poor the development expenditure can play very important role. The development expenditure on social sector can mitigate the gap between rich and poor. The development expenditure of Pakistan as a percentage of GDP has been very low. The current development expenditure as a percentage of total expenditure has been 15.3%, 18.6% and 19.2% during 2001-02, 2007-08 and 2008-09 respectively (Pakistan Economic Survey 2009-10)

The development expenditure had restraints mainly because of the debt obligations and defense expenditure. From 1998 to 2000 the expenditure on these two heads remained over 90 percent of tax revenue. In the absence of political settlement with India, the government may have little flexibility in reducing defense expenditure. In order to maintain the fiscal deficit around 5.1% of GDP the development expenditure was readjusted downward by Rs150 billion.

Only sustainable economic growth can be helpful in poverty reduction and there are strong linkages between pro-poor growth on the one hand, and human development, good governance, and cross-cutting concerns such as private sector development and regional cooperation on the other (ADB, 2002).

## **1V Data Source and Methodological Framework:**

### **4.1 DATA SOURCE**

The data<sup>1</sup> on Poverty is taken from the study done by Hassan and Siddiqi (2010)<sup>2</sup> and the data on Military Expenditures; Consumer Price Index, Industry Value Added, Service Sector Value Added,

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<sup>1</sup> The data on all the variables is available on the special request from the authors.

<sup>2</sup> The data on Head Count Ratio (Proxy for Poverty) was taken up to the year 2007 and for remaining two years the data is extrapolated.

and Foreign Direct Investment is obtained from the World Development Indicator CD-ROM (2010). The dataset ranges from 1972 to 2009 period.

#### 4.2 Methodological Framework

The following log linear model is used for investigation in the present paper:

$$LPOV_t = \alpha_C + \alpha_{ME_t} LME_t + \alpha_{CPI_t} LCPI_t + \alpha_{IND_t} LIND_t + \alpha_{SER_t} LSER_t + \alpha_{FDI_t} LFDI_t + \mu_t \quad (3.1)$$

Whereas;

$LPOV_t$	=	Poverty (Head Count Ratio)
$LME_t$	=	Military Expenditure as share of gross domestic product
$LCPI_t$	=	Consumer Price Index as a proxy for inflation
$LIND_t$	=	Industry Value Added as share of gross domestic product
$LSER_t$	=	Service Sector Value Added as share of gross domestic product
$LFDI_t$	=	Foreign Direct Investment as share of gross domestic product

Literature on Log Linear Approach made by various researches such as Ehrlich (1977); Layson (1983), Bowers and Pierce (1975), Cameron (1994) and Ehrlich (1996) validated that empirical findings computed through Log Linear Approach are more consistent than that of Functional Form Approach. A description of all the variables of the model is made below:

#### 4.3 Variables and Hypothesis

**Head Count Ratio as proxy for Poverty** is obtained by taking the ratio of the total number of people who are below the poverty line to the total population.

**Military Expenditures as share of GDP** is obtained by dividing the Military Expenditures on the Real GDP. It is perceived that whenever any government allocates a major share of its GDP to defense/military then it will eventually add to poverty of the country. Therefore, in order to control the cancer like poverty, resources may be allocated to development and productive side rather on non-productive side.

**Consumer Price Index** reveals the variation in the expenditures made by the average household in order to attain the basket of goods and services which may be remained constant or may be changed at specified intervals, such as yearly. To compute Consumer Price Index; usually Laspeyres method is applied.

**Industry Value Added as share of GDP** comprises value added in mining; manufacturing, construction, electricity, water, and gas. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is obtained by taking the ratio of the Industry Value Added to the Real GDP. It is expected that industrialization will be helpful to bring poverty down in the country.

**Service Sector Value Added as share of GDP** contains value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services etc. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is gained by taking the ratio of Service Sector Value Added to the Real GDP. It is anticipated that there is a positive relationship between poverty and growth of the service sector.

**Foreign Direct Investment as share of GDP** is obtained by taking the ratio of foreign direct investment to the real GDP. It is anticipated that the inflows in the country will be helpful to increase the market activities and hence will increase the income of the economy. It may speed up the process of industrialization and may help in reducing poverty.

### 4.3 Estimation Technique

This article applies various econometric techniques to perform an analysis of the military expenditures and poverty in case of Pakistan. Initially, the stationarity of the data series has been checked and the co-integration among the variables of the study has been analyzed. Finally the estimation of long term coefficients and short term coefficients are found. The following steps are followed in the study:

#### 4.4.1 Computing Stationarity

Ng – Perron (2001) applies GLS de-trending method of ERS in order to develop more consistent and proficient versions of the updated Phillip Perron tests of Perron and Ng (1996). These highly proficient and efficient modified PP tests do not reveal the severe size distortions of the PP tests for errors with large negative MA or AR roots, and also, they could have significantly high power than that of Phillip Perron tests; in particular when the value of  $\phi$  approaches to one. Using the GLS de-trended data  $y_t^d$ , the efficient modified PP tests are defined as

$$\overline{MZ}_a = (T^{-1}y_T^d - \hat{\lambda}^2) \left[ 2T^{-2} \sum_{t=1}^T y_{t-1}^d \right]^{-1} \quad (3.2)$$

$$\overline{MSB} = \left[ \frac{T^{-2} \sum_{t=1}^T y_{t-1}^d}{\hat{\lambda}^2} \right]^{1/2} \tag{3.3}$$

$$\overline{MZ}_t = \overline{MZ}_a \times \overline{MSB} \tag{3.4}$$

The statistics like  $\overline{MZ}_a$  and  $\overline{MZ}_t$  are more proficient and efficient versions of the Phillip Perron tests. In case of negative moving average errors; the magnitude of distortions in Phillip Perron  $Z_a$  and  $Z_t$  tests is quite meager. Ng – Perron derive the asymptotic distributions of these statistics under the local alternative  $\varphi = \frac{1-c}{T}$  for  $D_t = I$  and  $D_t = (I, t)$ . Specifically; they demonstrate there is no difference in the asymptotic distribution of  $\overline{MZ}_t$  and DF-GLS t-test. The statistic  $\overline{MZ}_t$  can possibly be estimated by applying the method of function unit root which is named as “mpp”.

#### 4.4.2 Computation of Long Term Variance $\lambda^2$

Ng – Perron (2001) test highlight the fact that computation of the long term variance  $\lambda^2$  plays a pivotal role for the implications of the proficient updated Phillip Perron test and as well as the finite sample behavior of the ERS point optimal test. The test also spotlight that the stable finite size of the sample can be obtained by using an autoregressive estimate of  $\lambda^2$ . Ng – Perron (2001) proposed that the variance  $\lambda^2$  should be computed by using the equation of Augmented Dickey Fuller (1981) test based on the GLS de-trended dataset:

$$\hat{\lambda}_{AR} = \frac{\hat{\sigma}_p^2}{(1 - \hat{\psi}(1))^2} \quad (3.5)$$

Where  $\hat{\psi}(1) = \sum_{j=1}^p \hat{\psi}_j$  and  $\hat{\sigma}_p^2 = (T - p)^{-1} \sum_{t=p+1}^T \hat{\varepsilon}_t^2$  are found by using the equation of

Augmented Dickey Fuller test.

#### 4.4.3 Finding Co-integration

To estimate the strength of relationship among the running actors we have applied Johansen and Juselius Approach (1990).

##### 4.4.3.1 Johansen Maximum Likelihood (ML) Approach:

Johansen Maximum Likelihood Approach was developed by Johansen and Juselius (1990) in order to investigate the existence of long term relationship among the variables. This approach comprises of two statistics; (i) Trace Statistic and (ii) Maximum Eigen – Value Statistic. Co-integrating equations hold only if the computed values from Trace Statistic and Maximum Eigen – Value Statistic are greater than that of their Critical Values. The equations for the both tests are given below:

$$\lambda_{trace} = L_A - L_O \quad (3.6)$$

Also;

The mathematical version of the Maximum Eigen Value test is given as below:

$$\lambda_{max} = -T \log(1 - \hat{\lambda}_{r+1}) \quad (3.7)$$

Before to compute Co-integration among the variables; it is vital to investigate lag length for the model. In this article, we have used Unrestricted Vector Autoregressive Model (UVAR) to

estimate lag length. Afterwards; the short term coefficients are computed by using Error Correction Mechanism (ECM). The equation for ECM is given as below:

$$\Delta LPOV_t = \beta_C + \beta_{ME_t} \Delta LME_t + \beta_{CPI_t} \Delta LCPI_t + \beta_{IND_t} \Delta LIND_t + \beta_{SER_t} \Delta LSER_t + \beta_{FDI_t} \Delta LFDI_t + \lambda_{ecm} \Delta I_{t-1} + \delta_t$$

(3.8)

V. Empirical Estimation and Interpretation of Results

Initially, unit root problem is tested by using Ng – Perron (2001) test. The results are exposed into Table –1

TABLE –1: UNIT ROOT TEST

NG-PERRON AT LEVEL WITH INTERCEPT $I(0)$				
Variables	$MZ_a$	$MZ_t$	$MSB$	$MPT$
$LPOV_t$	-4.46598	-1.36953	0.30666	5.69876
$LME_t$	0.68788	0.43649	0.63455	30.3285
$LCPI_t$	1.87501	2.17830	1.16175	107.475
$LIND_t$	1.22432	0.96209	0.78581	47.3911
$LSER_t$	-0.02894	-0.01568	0.54183	21.0899
$LFDI_t$	-0.19124	-0.18424	0.96340	49.8779
NG- PERRON AT 1 <sup>ST</sup> DIFFERENCE WITH INTERCEPT $I(1)$				
$\Delta LPOV_t$	-13.3977**	-2.58773*	0.19315	1.83056
$\Delta LME_t$	-8.86993**	-2.03555*	0.22949	3.02857
$\Delta LCPI_t$	-9.11421**	-2.13432*	0.23418	2.68971
$\Delta LIND_t$	-24.0812*	-3.44899*	0.14322	1.08726
$\Delta LSER_t$	-17.6995*	-2.92569*	0.16530	1.56228
$\Delta LFDI_t$	-7.14150***	-1.86817***	0.26159	3.50713
ASYMPTOTIC CRITICAL VALUES*				
1%	-13.8000	-2.58000	0.17400	1.78000
5%	-8.10000	-1.98000	0.23300	3.17000

10%	-5.70000	-1.62000	0.27500	4.45000
<b>Note: * &amp; **&amp;*** indicate significance at 1% &amp; 5% and 10% level.</b>				

The results computed into Table – 1 show that there was unit root problem at level and all the variables have become stationary at first difference. It is confirmed that the order of integration is  $I(1)$ . Besides it, maximum lag length is estimated by applying Unrestricted Vector Autoregressive (UVAR) method. By using Akaike information criterion (AIC), the maximum lag length is 2 (See Table-2).

**TABLE – 2: LAG LENGTH CRITERIA**

<b>VAR LAG ORDER SELECTION CRITERIA</b>						
<b>Lag</b>	<b>LOGL</b>	<b>LR</b>	<b>FPE</b>	<b>AIC</b>	<b>SIC</b>	<b>HQ</b>
<b>0</b>	258.4955	NA	3.26e-14	-14.02753	-13.76361	-13.93541
<b>1</b>	511.9867	408.4024	1.90e-19	-26.11037	-24.26293*	-25.46556*
<b>2</b>	555.6178	55.75088*	1.48e-19*	-26.53432*	-23.10336	-25.33682
<p><b>* indicates lag order selected by the criterion</b>  <b>LR: sequential modified LR test statistic (each test at 5% level)</b>  <b>FPE: Final prediction error</b>  <b>AIC: Akaike information criterion</b>  <b>SIC: Schwarz information criterion</b>  <b>HQ: Hannan-Quinn information criterion</b></p>						

According to Johansen and Juselius (1990) approach; if it is diagnosed the same order of integration for all the variables at first difference then this approach reveals more consistent; strong and reliable results for computing the long term strength of relationship among the variables. The estimated results through Johansen and Juselius (1990) approach in the light of computed maximum lag length = 2 are demonstrated in Table – 3.

**TABLE – 3: UNRESTRICTED COINTEGRATION RANK TEST**

UNRESTRICTED CO-INTEGRATION RANK TEST							
Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob. ** Value	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob. ** Value
None *	203.2479	103.8473	0.0000	None *	58.83296	40.95680	0.0002
At most 1 *	144.4150	76.97277	0.0000	At most 1 *	52.62090	34.80587	0.0002
At most 2 *	91.79405	54.07904	0.0000	At most 2 *	36.56596	28.58808	0.0039
At most 3 *	55.22809	35.19275	0.0001	At most 3 *	28.27873	22.29962	0.0065
At most 4 *	26.94936	20.26184	0.0051	At most 4 *	19.24595	15.89210	0.0143
At most 5	7.703414	9.164546	0.0940	At most 5	7.703414	9.164546	0.0940

Trace test and Maximum Eigen Statistic indicate 5 co-integrating equations at the 0.05 level.  
 \* denotes rejection of the hypothesis at the 0.05 level.  
 \*\*MacKinnon-Haug-Michelis (1999) p-values.

The empirical findings regarding the Johansen and Juselius (1990) Maximum Likelihood Approach are presented in Table-3. Johansen and Juselius (1990) maximum likelihood methodology comprises of two statistics such as (i) Trace statistics and (ii) Maximum Eigen statistics. It has empirically found by the both statistics that there exists five co – integrating equations at 05 % level of significance.

The relationship between Military Expenditure and Poverty has been tested for both long term and short term time period. The long term coefficients are examined by applying Ordinary Least Square Method and the results are presented in Table – 4.

TABLE – 4: ESTIMATED LONG TERM DYNAMICS

DEPENDENT VARIABLE: $LPOV_t$				
Variable	Coefficient	Std. Error	t-Statistic	Prob. Value
$LPOV_{t-2}$	-0.494486	0.152808	-3.235992	0.0031
$LPOV_{t-1}$	1.076151	0.147413	7.300255	0.0000
$LME_t$	0.447071	0.157598	2.836771	0.0084

$LCPI_t$	0.542639	0.131745	4.118871	0.0003
$LIND_{t-1}$	-1.058072	0.534397	-1.979937	0.0576
$LSER_{t-1}$	-1.181611	0.458672	-2.576159	0.0156
$LFDI_t$	0.107271	0.259946	0.412668	0.6830
$C$	7.481840	2.131711	3.509782	0.0015
<b>R-squared</b>	0.945112	<b>Mean dependent variable</b>		3.2330
<b>Adjusted R-squared</b>	0.931390	<b>S.D. dependent variable</b>		42
<b>S.E. of regression</b>	0.049406	<b>Akaike info criterion</b>		0.188619
<b>Sum squared residual</b>	0.068347	<b>Schwarz criterion</b>		-2.984352
<b>Log likelihood</b>	61.71834	<b>Hannan-Quinn criteria.</b>		-2.632459
<b>F-statistic</b>	68.87520	<b>Durbin-Watson statistics</b>		-2.861532
<b>Prob. Value (F-statistic)</b>	0.000000			2.203263

The results reveal that that military expenditure exerts positive and significant impact on poverty. For example, one unit increase in military expenditure increases poverty by 0.44. The inherent justification may be that the military expenditure in Pakistan may be done at the expense of development expenditure and thus may have negative impact on economic growth in Pakistan as the studies by Smith (1980) and Dunne (1996) have shown the negative relationship between military expenditure and economic growth for the case of developing countries. It is evident from the results that poverty lagged by one year accentuates the poverty in the current year. It is quite possible that because of military expenditures expenditure on social development is hampered thus accelerating the poverty. Results also indicate that poverty if lagged by two years helps in reducing poverty in the subsequent years. The underlying reason may be that realizing the poverty problem some measures are taken to target it that shows its positive impact in curtailing the poverty.

The empirical results show the positive and significant relationship between consumer price index a proxy for inflation and poverty in case of Pakistan. The relationship is quite obvious as inflation always erodes the standard of living of common people and increases their miseries. Poor people are more prone to inflationary pressures than the rich class. The results are supported by the earlier study by Kalim and Shahbaz (2009) where they have found a positive relationship between inflation and poverty in case of Pakistan.

The role of industrial and service sectors has been also examined to investigate their contribution to poverty reduction. The results indicate that the value added by the industrial sector and the service sector helps in reducing the poverty in Pakistan. In the present study it is found that it takes some time for the growth of the industrial sector to influence poverty. The growth of industrial and service sector lagged by one year significantly reduces poverty in the next year. The coefficient of the service sector indicates its larger impact on the reduction of poverty as compared to the industrial sector. It is obvious that industrialization and extension in the service sector boost up employment opportunities in the country resulting in more income generation.

Foreign direct investment does not have any significant impact on poverty in case of Pakistan. Earlier Kalim and Shahbaz (2009) found a positive relationship between FDI and poverty in Pakistan. They justify this positive relationship on the basis of the presumption that FDI in specific sectors like “telecommunications and financial services or services sectors” of economy may be creating skilled jobs instead of providing job opportunities to unskilled labor.

The impact of military expenditures along with other macro economic variables on poverty is also investigated for the short run by applying Error Correction Mechanism Approach

(Table –5). The ECM coefficient shows the speed of adjustment of variables towards equilibrium and it should be significant with negative sign. These were Bannerjee *et al* (1998) who argued that the negative and significant coefficient of  $ECM_{t-1}$  will indicate convergence to long term stable equilibrium.

TABLE – 5: ESTIMATED SHORT TERM RESULTS

DEPENDENT VARIABLE: $\Delta LPOV_t$				
Variable	Coefficient	Std. Error	t-Statistic	Prob. Value
$\Delta LPOV_{t-1}$	0.838165	0.147991	5.663613	0.0000
$\Delta LME_t$	0.969464	0.221043	4.385863	0.0002
$\Delta LCPI_t$	0.776497	0.266768	2.910753	0.0073
$\Delta LIND_t$	0.826851	0.401616	2.058813	0.0497
$\Delta LSER_t$	-0.127850	0.459878	-0.278009	0.7832
$\Delta LSER_{t-1}$	-0.972500	0.440587	-2.207282	0.0363
$\Delta LFDI_t$	-0.658241	0.375829	-1.751441	0.0917
$ECM_{t-1}$	-0.973598	0.258699	-3.763437	0.0009
C	-0.001456	0.023246	-0.062653	0.9505
R-squared	0.680946	Mean dependent variable		-0.015825
Adjusted R-squared	0.582776	S.D. dependent variable		0.075031
S.E. of regression	0.048465	Akaike info criterion		-2.998918
Sum squared residual	0.061070	Schwarz criterion		-2.598972
Log likelihood	61.48107	Hannan-Quinn criterion		-2.860857
F-statistic	6.936369	Durbin-Watson stat		2.041970
Prob. Value (F-statistic)	0.000069			

It is found that the first period lag term of poverty; military expenditures, inflation, and industrialization are significantly increasing poverty in the short run for the case of Pakistan. The service sector when lagged by one year shows a significant negative relationship with

poverty. The impact of foreign direct investment on poverty is negative in the short run but the relationship between the two is weak. The correction into short term fluctuations for the attainment of long term stable equilibrium is being scrutinized by inculcating the first period lag term of error correction term. Short term results reveal that  $ECM_{t-1} = -0.973598 (0.0009)$  indicating that the speed of adjustment in the long run is high and it takes almost 1.03 years ( $1.027118 = 1/0.973598$ ) to attain the long run equilibrium.

## VI . Conclusion and Policy Implications

This paper investigated the impact of military expenditures, inflation, industrial sector, service sector, and foreign direct investment on poverty for both long term and short term for the dataset ranging from 1972 – 2009 periods.

The results have shown that the Military Expenditures and inflation are directly and significantly contributing to Poverty in both long run and short run and military expenditures are pro poverty in Pakistan. Empirical investigation reveals that poverty is becoming significantly severe because of its first period lag term in both long term and short term analysis. Whereas it shrinks significantly because of its second period lag term only in the long term. It has also been diagnosed that the first period lag term of industry is significantly contributing to lowering poverty in the long term whereas in the short term industrialization does significantly elevate poverty. It means it takes some time to bear the fruits of industrial growth in terms of reduction in poverty.

The service sector does reduce poverty significantly in both long term and short term. Finally; foreign direct investment does not play any role in the reduction of poverty in the long term, but surprisingly it has some significant negative impact on poverty in the short run.

From the empirical findings many policy implications can be deduced. The findings suggest that the military expenditure deteriorates the poverty situation in Pakistan. The viable policy option may be to revise the volume of military expenditure in perspective of the reallocation of resources from the defense expenditure to the expenditure on social development of the economy. The caution that requires to be considered is the proper and efficient reallocation of resources.

Growth in industrial and service sector can be targeted to eliminate poverty. This can be done by analyzing carefully the problems related to the progress of these sectors particularly the industrial sector where the growth has been sluggish for many years mainly due to energy crises.

Inflation can be controlled via both monetary and fiscal policy measures. Fiscal deficit; another feature of Pakistan's economy plays it crucial role in high inflation and could be checked by adopting stringent measures.

## REFERENCES

- Aizenman J., and Reuven G., (2006), Military Expenditure, Threats, and Growth, *Journal of International Trade and Development*, 15, 2: 129-155.
- Arif, G.M., Hina Nazli and Rashida Haq (2000). Rural Non-agriculture Employment and Poverty in Pakistan, *Pakistan Development Review*, Vol. 39, No. 4, Pakistan Institute of Development Economics, Islamabad.
- Asian Development Bank (2002), *Poverty in Pakistan: Issues, causes and Institutional Responses*, Report.
- Atesoglu, S.M. (2002), Defense Spending Promotes Aggregate Output in the United States: Evidence From Cointegration Analysis, *Defense and Peace Economics*, 13(1):55-60.
- Atesoglu, S.H. (2004), Defense Spending and Investment in the United States, *Journal of Post Keynesian Economics*, 27(1): 163-169.
- Bowers, W., & Pierce, G. (1975). The Illusion of Deterrence in Isaac Ehrlich's Work on the Deterrent Effect of Capital Punishment". *Yale Law Journal* , 85 (2), 187-208.
- Bank W. (2010). World Development Indicators [CD Rom 2010]. *World Bank, Washington, D.C.*
- Bannerjee, A., Dolado, J., & Mestre, R. (1998). Error-Correction Mechanism Tests for Co-integration in Single Equation Framework. *Time Series Analysis* , 19 (3), 267-283.
- Cameron, S. (1994). A Review of the Econometric Evidence on the Effects of Capital Punishment. *Journal of Socio-economics* , 197-214.
- Collier, P. and A. Hoeffler. (2002a), On the Incidence of Civil War in Africa, *Journal of Conflict Resolution* 46, 13-28.

Collier, P. and Hoeffler, (2002b), *Greed and Grievance in Civil War*, WPS 2002-01, Centre for the Study of African Economies, Working Paper, <http://www.economics.ox.ac.uk/CSAEadmin/workingpapers/pdfs/2002-O1 text.pdf>

Dickey, D. A., & Fuller, W. A. (1979). Distribution for the Estimates for Auto Regressive Time Series with a Unit Root. *Journal of the American Statistical Association* , 74 (366), 427-31.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica* , 49 (4), 1057-1072.

Dunne J.P., (1996), Economic Effect of Military Expenditure in Developing Countries: A Survey in Gleditsch et al (eds). *The Peace Dividend*, Elsevier: Amsterdam 1996, Chapter 23.

Dunne, J.P., Freeman, S.P. and Soydan, A. (2002), 'Military Expenditures and Debt: A Cross Country Analysis', paper submitted in the *conference on Defense and the Economy*, Tesev, Istanbul.

Dunne, P. and Perlo-Freeman, S (2003), The Demand for Military Spending in developing Countries, *International Review of Applied Economics*, 17, 23-48.

Ehrlich, I. (1996). Crime, Punishment and the Market for Offences. *Journal of Economic Perspectives* , 10, 43-67.

Ehrlich, I. (1977). The Deterrent Effect of Capital Punishment Reply. *American Economic Review* , 67, 452-58.

Elliot, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient Tests for an Autoregressive Unit Root. *Econometrica* , 64 (4), 813-836.

Engle, R. F., & Granger, G. (1987). Co-integration and Error Correction: Representation, Estimation and Testing. *Econometrica* , 55 (2), 251-276.

- FBS. (2010). *Statistics About Pakistan Economy*. Federal Bureau of Statistics, Islamabad.
- Fredericksen, P.C. and Looney, R.E. (1983), Defense Expenditures and Economic Growth in Developing Countries, *Armed Forces and Society*, 9: 633-45.
- Gilbert, J. (2008), BIMSTAC-Japan Trade Cooperation and Poverty in Asia, Centre for Studies in Asia in International Relations and Developmen, CSIRD Discussion paper No. 9201.
- Guillou, S., Lazaric, N., Longhi, C. and Rochhia, S. (2009), The French Defense Industry in the Knowledge Era: A Historical review and Evidence from Empirical Data, *Research Policy*, 38: 170-180.
- Hassan, M. S., & Siddiqi, M. W. (2010). Trade Poverty Nexus: An Empirical Investigation from Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 2 (6), 500-520.
- Henderson Anthony E.(1998), Military Spending and Poverty, *The Journal of Politics*, 60: 503-520.
- International Monetary Fund Survey (1999), *Military Spending Continues to Stabilize; Some Countries Increase Social Spending*, 7th June, 186-188.
- Jamal, H. (2006), Does inequality matter for poverty reduction? Evidence from Pakistan's poverty trends. *The Pakistan Development Review*, 45, 439-459.
- Johansen, S. (1991). Estimation and hypothesis testing of co-integrating vectors in Gaussian vector autoregressive models. *Econometrica*, 59, 1551–1580.
- Johansen, S. (1995). *Likelihood-based Inference in Cointegrated Vector Autoregressive Models*. Oxford: Oxford University Press.
- Johansen, S. (1996). *Likelihood-Based Inference in Co-integrated Vector Autoregressive Models* (Vol. 14). USA: Oxford University Press.

- Johansen, S. (1988). Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control*, 12 (2-3), 231-254.
- Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inferences on Co-integration. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.
- Kalim, R., and Shabaz M., (2009), Remittances and Poverty Nexus: Evidence from Pakistan, *International Research journal of Finance and Economics*, 29, 46-59.
- Landau Daniel (1983), The Impact of Military Expenditure on Economic Growth in the Less Developed Countries, *Defense and Peace Economics*, 5, 173-268.
- Layson, S. (1983). Homicide and Deterrence: Another View of the Canadian Time-Series Evidence. *The Canadian Journal of Economics*, 16 (1), 52-73.
- Looney R.E., (1989), Defense Expenditures and Savings in Pakistan: Do Allocations to the Military Reduce National Savings? *Journal of Conflict Resolution*, vol. 33, pp. 213-230
- Moon, H. R. (1999). A note on fully-modified estimation of seemingly unrelated regressions models with integrated regressors. *Journal of Economics Letters, Elsevier*, 65 (1), 25-31.
- Ng, S. and P. Perron, 2001. Lag Length Selection and the Construction of Unit Root Test with Good Size and Power. *Econometrica*, 69(6): 1519-1554.
- Pakistan Economic Survey. (2010). *Government of Pakistan, Finance Division, Economic Adviser's Wing, Islamabad.*
- Pedroni, P. (2000). Fully Modified OLS for Heterogeneous Co-Integrated Panels. In: Baltagi, B., ed. Non-stationary Panels, Panel Co-integration, and Dynamic Panels, *Advances in Econometrics*. 15 (Amsterdam: JAI Press), 93–130.
- Pedroni, P. (1995). Panel co-integration: asymptotic and unite sample properties of pooled time series test with an application to the PPP hypothesis. *Indiana University Working Papers in Economics*, No. 95-013 .

- Phillips, P. C. B and P. Perron (1988) Testing for a Unit Root in Time Series Regression. *Biometrika* **75**(2), pp. 335-346.
- Phillips, P. C. (1999). Linear regression limit theory for non-stationary panel data. *Econometrica* , **67**, 1057–1111.
- Phillips, P. C., & Hansen, B. E. (1990). Statistical Inference in Instrumental Variables Regression with I(1) Processes. *The Review of Economic Studies* , **57** (1), 99-125.
- Narayan, P.K. and Singh, B. (2007), Modelling the relationship between Defense Spending and Economic growth for the Fiji Islands, *Defense and Peace Economics*, **18**(4): 391-401.
- Pieroni, Luca (2009), Military Expenditure and Economic growth, *Defense and Peace Economics*, **20**, 4: 327-339.
- Pieroni, L., Giorgio A.' MaRCO, L. (2008), "Can We Declare Military Keynesianism Dead?", *Journal of Political modeling*, **30**: 675-691.
- 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): pp. 436-460.
- SBP (2008-09), Statistical Bulletin of State Bank of Pakistan, Karachi. Pakistan.
- Smith R.P. (1980), *Military expenditure and investment in OECD countries, 1954–1973*, *Journal of Comparative Economics*, **4**(1), pp.19-32.
- Stock, J. H., & Watson, M. W. (1993). A Simple Estimator of Co-integrating Vectors in Higher Order Integrated Systems. *Econometrica* , **61** (4), 783-820.

Stock, J. H., & Watson, M. W. (1988). Testing for Common Trends. *Journal of the American Statistical Association*, 83 (404), 1097–1107.

Stroup and Heckleman (2001), "Size of the Military Sector and Economic Growth: A Panel Data Analysis of Africa and Latin America, *Journal of Applied Economics*, 2, 329-360.

UNDP. (2009). *Human Development Report, Overcoming Barriers: Human Mobility and Development*. United Nation Development Program.

Winter, L.A., et al (2004), Trade Liberalization and Poverty : The Evidence So Far, *Journal of Economic Literature*, 72-115.

Wolf, C. (1981), "Economic Success, Stability and the Old International Order", *International Security*, 6(1): 75-92.

<http://dawn.com/2012/09/26/poverty-in-pakistan-2/>

<http://tribune.com.pk/story/495045/laid-to-rest-hawaid-police-sho-imam-hassan-dies-in-hospital/>