DEFENSE EXPENDITURE AND ECONOMIC GROWTH: A CASE STUDY OF PAKISTAN

MUHAMMAD HASEEB

MASTER OF ECONOMICS
UNIVERSITI UTARA MALAYSIA
February 2014

DEFENSE EXPENDITURE AND ECONOMIC GROWTH: A CASE STUDY OF PAKISTAN

BY

MUHAMMAD HASEEB

Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
in Fulfillment of the Requirement for the Degree of Master

PERMISSION TO USE

In presenting this thesis in fulfillment of the requirements for a Master degree from the Universiti Utara Malaysia (UUM), I agree that the Library of this university may make it freely available for inspection. I further agree that permission for copying this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business where I did my thesis. It is understood that any copying or publication or use of this thesis or parts of it for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the UUM in any scholarly use which may be made of any material in my thesis.

Request for permission to copy or to make other use of materials in this thesis in whole or in part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

ABSTRACT

The objective of this study was to examine whether there is exists a long run relationship between defense expenditure and economic growth, and investigate the plausibility of using defense expenditure as a macroeconomic stabilization tool (referred as Military Keynesianism Hypothesis) in case of Pakistan over the period 1975 – 2010. The Autoregressive Distributed Lag (ARDL) bounds testing approach was used to find out long run relationship between defense expenditure, economic growth, development expenditure, inflation and national saving. The Augmented Dickey-Fuller (ADF) test was used for checking stationarity. The results of ADF test revealed that inflation and saving are stationary at level while defense expenditure, development expenditure and GDP become stationary at first difference. Results of ARDL indicated that data is stable and confirmed the existence of long run relationship. The robustness of the model has been confirmed by diagnostic tests for serial correlation, function form, normality, hetroscedasticity, and structural stability for the model. The selected model generally passes all diagnostic tests and proves the robustness of the selected model. Moreover, results show that defense expenditure has negative impact on economic growth while saving has positive impact on economic growth but other variables have no impact on economic growth. These results for long run negative relationship between defense expenditure and economic growth suggest that in case of Pakistan MKH does not hold over the estimation period. The negative long run relationship between defense expenditure and economic growth implies that the policy makers need to have a greater focus on development spending as compared to defense spending.

Keywords: ARDL, economic growth, defense expenditure, inflation, Pakistan.

ACKNOWLEDEMENT

Challenged by exhausting obstacles, eventually I managed to complete this study at the University Utara Malaysia (UUM). Because of this achievement, I would like to say Alhamdullillah, the highest gratitude to Allah SWT for his continuous blessing and guidance until this thesis is materialized.

During the writing of this thesis, the author continuously had intervened by the riddle and constraints, but God's hand and other fellow's assistance were the truly grant in completing this thesis. For that, the author humbly thanks a sincere gratitude to:

Associate Professor Dr. Nor Aznin Bt Abu Bakar for her guidance and understanding throughout my Master program. Her valuable advices and comments during my study have helped me to finish this thesis and achieve my professional career goal. Special thanks to Associate Professor Dr. Sallahuddin Hassan for his comments and guidance to complete this thesis.

I also wish to acknowledge my indebtedness to my family specially my mother for their fulfilling support and understanding as well as their prayers.

Last but not least, my gratitude also goes to Dr. Azam Khan (Department of Economics, UUM), Mr. Noman Arshad (The University of Edinburgh, UK) and Mr. Haroon Hafeez (PhD Scholar, UUM) for their help throughout my thesis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATION

ARDL	Autoregressive Distributed Lag
ADF	Augmented Dickey Fuller
AIC	Akaike Information Criteria
CUSUM	Cumulative Sum
DF	Defense Expenditure
DV	Development Expenditure
ECM	Error Correction Model
FBS	Federal Bureau of Statistics
FBR	Federal Bureau of Revenue
FATA	Federally Administered Tribal Area
GDP	Gross Domestic Product
GNP	Gross National Product
GMM	Generalized Method of Moments
HDI	Human Development Index
INF	Inflation

LDC	Less Developed Countries
MFN	Most Favored Nation
MDG	Millennium Development Goals
MKH	Military Keynesian Hypothesis
NFC	Navy Federal Credit
NATO	North Atlantic Treaty Organization
OCED	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PPP	Purchasing Power Parity
PP	Phillips Person
R&D	Research and Development
SIPRI	Stockholm International Peace Research Institute
SSA	Sub-Saharan Africa
SAV	Saving
SIC	Schwarz Information Criteria
USA	United State of America
VECM	Vector Error Correction Model

WGI	World Governance Index
WBI	World Bank Index

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The relationship between defense expenditure and economic growth has attracted considerable interest among economists as well as policy makers. The military spending is a global issue during the end of the Second World War which provided a chance for developing as well as developed countries to decrease their military spending. The purpose of increasing defense expenditure is mainly to cooperate with local insecurity and arm race. Moreover, developed countries have focus on the point about possible harmful effects of unfettered military expenditure in developing countries. It was argued that military expenditures may lead to problem of balance of payment deficit, decrease in economic growth, and as a result of it, important social and economic expenditure may be crowed out. Therefore, these concerns have been raised in the past wars in Afghanistan, Iraq, Kashmir, Bosnia, Chechnya, Palestine and collapse of Soviet Union.

The relationship between defense expenditure and economic growth has been highly debating among economist. In general, results of different studies have shown that defense expenditure can affect the economy both positively and negatively [Yildirim*et al*., 2006; Dakurah*et al*., 2000; Kollias*et al*., 2004]. Previous results were inconsistent and mix; thus defense expenditure can affect economic growth in different ways. Hassan *et al*. (2003) stated that defense expenditure can affect economic growth positively

through an increase in security or the expansion of aggregate demand and can also affect it negatively through crowd out investment (Deger,1986).In the case of developed countries, increase in defense spending is negatively related to economic growth, employment and investment [Pradhan, 2010; Wilkins, 2004; Ram, 2003]. However, in the case of developing countries, the situation is unclear and complex. What is the effect of defense expenditure on development? There have been numerous attempts to answer this question since the seminal work of the Benoit (1973). Before the study of Benoit (1978) about "Growth and defense in developing countries", the issue of defense spending in developing countries was not a highly debatable among the researchers. There is a common presumption that the defense expenditure is a burden on the economy and is negatively related to economic growth. As a classical example, the pioneer study by Benoit (1978) entitled "Bread vs. Guns" can be considered. Benoit argued that "countries with heavy defense burden show a high growth rate and countries with low defense burden shows a low growth rate". His argument is based on a cross sectional study of 44 developing countries. This study stimulated the researchers to further investigate and explore the relationship between defense expenditure and economic growth.

However, some studies by Wilkins, (2004), Aizenman and Glick (2006), Dunne *et al*. (2002), Habibullah*et al.* (2008) have shown insignificant or no meaningful relationship between defense expenditure and economic growth. In some studies, results have shown mixed results, as per the findings of Dakurah*et al*. (2000) and Kollias*et al*. ((2004).

1.1.1 Economic Growth and Government Expenditure of Pakistan

Pakistan needs to acquire and maintain a high Gross Domestic Product (GDP) growth by spending more on development. The trends in GDP growth is shown by Figure 1.1. It show that in the period 1980 – 2010,the average GDP was 5.30 percent which is very low when compared to other Asian countries, such as Malaysia, Singapore, Thailand, Iran and India. (Pakistan Economic Survey 2010)

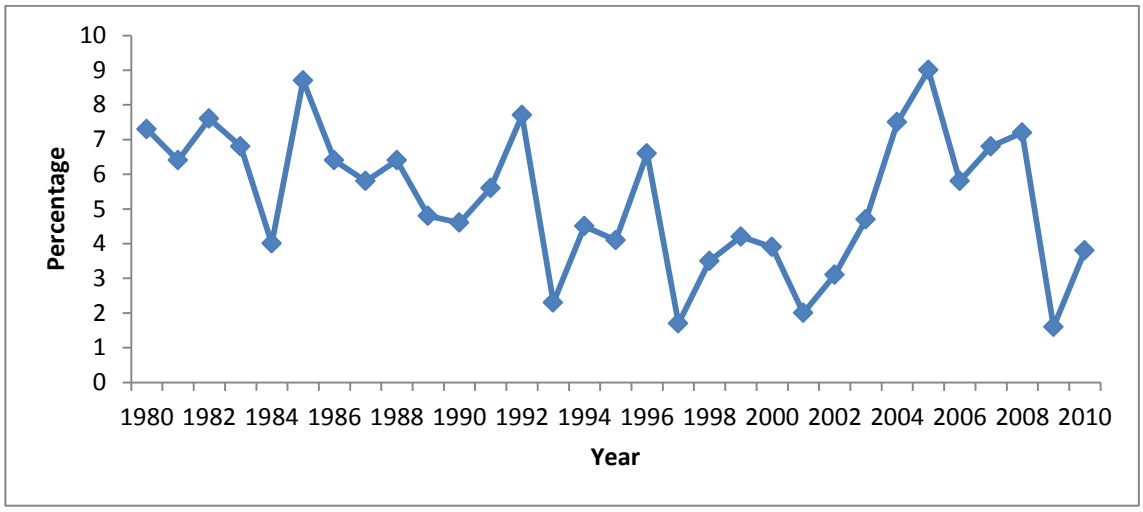

Figure 1.1
GDP Growth of Pakistan (percent), 1980 – 2010

The highest GDP growth was recorded in 1995 due to long term stable economic policy implemented by military ruler, General Zia-Ul-Haq. In contrast, the lowest GDP growth was recorded in 2009 due to bad internal and external security, high debt and unstable economic policy implemented by civilian ruler of Yousaf Raza Gillani. Despite of facing hyper inflation, high poverty rate, significant unemployment, energy crises, debt burden and many other major socio-economic issues, Pakistan spent huge amount on defense as

an effort to maintain the credibility of occupying a vital geopolitical position in Afghan's war, having nuclear capabilities and a long outstanding dispute over the territory of Kashmir with India. Researchers claim that Pakistan spent more on non-development projects compared to development projects. The government of Pakistan spend an average of 0.73 percent on health, 0.54 percent on education, 3.46 percent on development and 5.05 percent on defense [in the period 1980-2010] (Economic Survey of Pakistan economy 2010). Furthermore, Figure 1.2 shows the trend of defense, development and health expenditure of Pakistan. In fact, Pakistan is one of the major countries who have spent major part of their budget on defense since her independence.

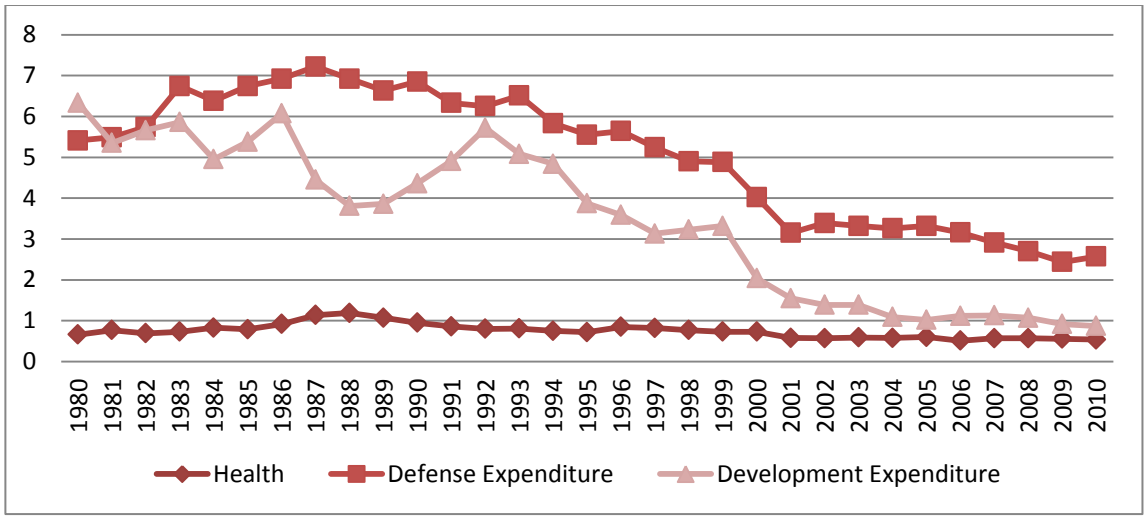

Figure 1.2
Defense Expenditure, Development Expenditure and Health Expenditure (percent of GDP), 1980 - 2010

Another important point which can be raised from Figure 1.2 is the movement of development to total expenditure ratio and its relation with defense to total expenditure ratio. It is generally perceived that massive decline in development expenditure to GDP ratio over the last decade is primarily on the account of huge defense expenditure.

However, the data do not lend credence to this view, as both defense and development expenditure which has declined since mid- 1980s, did not only decline in terms of their ratios to total expenditure but also in terms of GDP.

As compared to health, education and development expenditure, the percentage of defense expenditure shows a high trend. During the period 1980-2010, GDP growth on an average of 5.30 percent, saving 15.11 percent and inflation 8.54 percent was measured (Economic Survey of Pakistan economy 2010). As shown in Figure 1.2, from 1980 to 2010, defense expenditure was high as compared to development expenditure and health expenditure. Broadly speaking in the presence of low literacy rate (Pakistan is ranked 134th literate country in the world), high deficiency of medical facilities and other basic necessities, Pakistan spent 5.05 percent (on an average from 1980 – 2010) on defense which is almost 10 times higher than health and education expenditure. In 2010, health expenditure on per person per annum was RS 514 or USD 5.3, which was very low in the presence of 11.7 percent inflation (World Bank, 2010).

Pakistan's defense spending has remained one of the largest components of total government expenditures since independence. Although, a sizeable variation in defense expenditure to GDP ratio has been witnessed over the past six decades, thus the ratio declined significantly toward the end of the 20th century. The absolute size of defense expenditure was considered still very high. The trend of Pakistan's defense expenditure is shown in Figure 1.3. Specifically, it shows the highest defense expenditure at 7.22 percent in 1987 and lowest the defense expenditure at 2.44 in 2009.

This exceptionally high share of defense expenditures in early years of independence may be largely attributable to the government efforts in achieving a minimum level of deterrence, necessitated by the conflict on the disputed territory of Kashmir and a war with India in 1948.

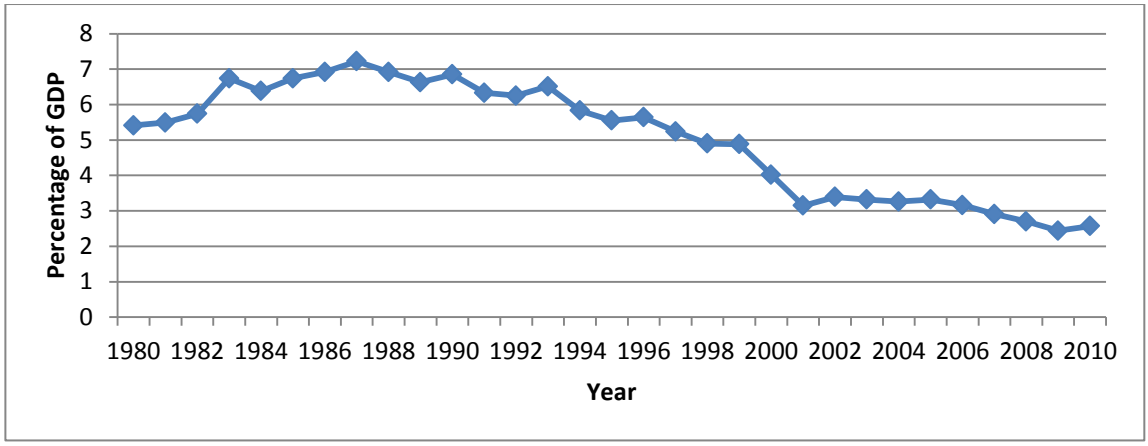

Figure 1.3
Defense Expenditure (percent of GDP), 1980 - 2010

After that, the share of defense expenditure in the total expenditure observed a considerable decline with some fluctuations before spiking up again in 1966 on account of 1965 war with India . In the post-1965 war era, the defense spending to the total expenditure ratio observed a sharp reversal in fiscal year 1967. However, this decline was proved short lived, as the ratio surged again in 1972 due to 1971 war before dipping down to pre-1965 war trend. After 1972, the ratio gradually declined up till 1980. However, the declining trend again increased up to 1987 with one small fluctuation following the high tension in Afghanistan (Pakistan as a front line state).

During the first half of 1980s, the share of defense expenditure was averaged 26.8 percent of the total expenditure, indicating an increase of 4.1 percent on average ratio for the second half of1970s. The withdrawal of Russian forces from Afghanistan was coupled with the prevalence of high fiscal deficits which propelled government to revisit its defense spending. As a result, the decade of 1990s was recorded as a considerable decline in the share of defense expenditure. The decline in the second half of1990s was more pronounced when compared to the first half. Despite tensions on borders with Afghanistan(following the September 11) and India (due to the incident of December 13), the share of defense expenditure continued to decline with a little bit change, 14.43 percent, 14.81 percent and 14.67 percent in 2008, 2009 and 2010, respectively. This recent declining trend amidst a few episodes of tension is largely underpinned by the nuclear capabilities of Pakistan and India. The possession of nuclear weapons by both countries seems to be an important factor in minimizing the chances of war, even with the enlargement of traditional weapons.

The evidence from the decline in defense and development expenditures over the past one and half decades is largely attributable to the consolidation of public sector. Furthermore, the rise in defense expenditure is generally accompanied by the increase in overall expenditures, instead of a decline in development expenditure. Specifically, there were only seven years (out of 36 years) in which the increase in defense expenditure to GDP ratio did not accompany the increase in total expenditures to GDP ratio, but move along with the declines in the development expenditure to GDP ratio.

1.1.2 Defense Spending and Economic Growth

The economy glides around scarcity of resources, and its efficient allocation along different alternatives and growth or stability of distribution system. Opportunity cost (value of best foregone alternative) is a phenomenon which generates when choices are made between different alternatives due to resource constraint. Defense economics is a domain of macroeconomics which studies the defense expenditure management during peace and war and analyzes its externalities on other sectors of the economy (Hartley & Sandler, 1995).

The 'Mercantilism' is an economic doctrine that is closely related with military and security economics, and was subjugated in the world from the 16^{th} to 18^{th} centuries. In this era, mercantilists dominated the different parts of the world through trade and afterwards, they captured it geopolitically. In short, it was a system of power politics. It had the clear stance that countries should encourage and enhance the defense base industries.

The basic notion in the 'Mercantilism' approach is that an influential and powerful country must hold a strong financial system that would help to boost up its security. This kind of economy demands a very strong basis of natural resources, high GDP, advanced technology and highly developed skills. For the realists and neo-mercantilists, the state intervention is an important factor to enhance national security (Kapstein, 1992). Military Keynesianism focuses on defense spending as a component of aggregate demand, and explains the spillover and economic effect of defense expenditure.

Increased aggregate demand due to high defense spending will add in economy's output and generate employment. Benoit (1978) suggests that this Keynesian effective demand can enhance its productivity by lowering the resource cost, reducing unemployment, and increasing profit. Therefore, this will lift the investment rate and result in growth with a multiplier effect.

Accordingly, defense spending can contribute in economy's income by reducing unemployment through the multiplier effect and demand stimulation. Defense spending provides technological benefits through research and development (R&D) and spin-offs it to the civil sector, which can promote growth. Defense spending specially in Less Developed Countries (LDCs) provides social infrastructure, human capital and services to civil sector. In addition, defense spending also provides security to citizens where internal and external stability attracts domestic and foreign investment.

What would be the effects of high defense spending if an economy is operating at its potential or full employment? Most probably, it could result in some problems such as inflation and balance of payment. Whereas 'Neo-classical' economics analyzed the opportunity costs of defense spending and adjustments in the market due to such spending. Opportunity costs imply that if the resources of an economy are spent on defense, then they cannot be used to produce any other goods and services. Neo-classical economics has tool of demand and supply to assess the impact of changing demands between military and civil goods by taking into account the changes in price and quantities in labor and product market. (Sandler & Hartley, 1995) Conclusion of the

Military Keynesianism and Neo-classical point of view are shown in Figure 1.4. The figure shows the mechanism of defense expenditure effect on economic growth.

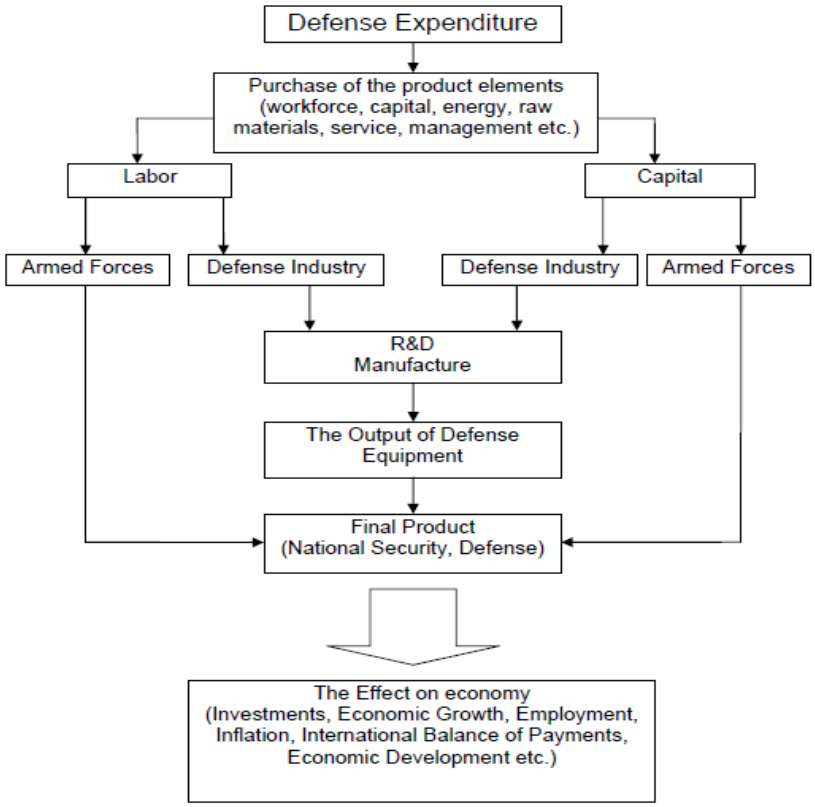

Figure: 1.4
Source: Sandler, Todd and Hartley, Keith (1995), The Economics of Defense,Cambridge University Press

Hartley and Sandler (1995) mention the effects of defense spending. They argued that defense may divert resources away from public and private sector, which may add positively to growth than defense spending. Defense research and development R&D may divert resources from private sector R&D activities affecting both technology and spin-offs. However, the resources hold both physical and human capital.

1.2 PAK – INDIA RELATIONSHIP

Defense remains an important subject for Pakistan due to historical and psychological reasons, hence Pakistan find it important to import arms for its defense. The security approach which is based on military aspect of national security is not enough to deal with new threats to the security of Pakistan and South Asia. Therefore, it is a pressing need on circumstances and time to consider the non-military threats. The question arises that how the rival states can recover their social security without neglecting military security. Thus, both countries can keep military security and social security well balanced by integrating liberal ideas to their policies.

The idea of developing Pakistan's relation with India by initiating trade and regional co-operation along with a local stable environment, internal security and economic considerations is a key element in developing national security strategy which is the need of time too. Due to an unstable security situation, Pakistan is facing a major decline in attracting foreign direct investment, deterioration of local industry and infrastructure. Therefore, persistent mistrust between Pakistan and India is worsening the regional security and it can affect the economic growth of both states. Internal security and regional trade & co-operation come at the top of the list followed by internal security and domestic economic performance.

Kashmir remains the core issue between Pakistan and India which has caused two full scale wars. Both states could solve this issue by institutionalizing the dialogue process on Kashmir. This dialogue process should be done by constituting a Joint Working

Group and it should include representatives from the government and from the society. This body will help to attain the dialogue process and the progress has been seen where the Kashmiri people were invited by both states to include them in finding a solution for them. Pakistan and India being two big powers in the region need to enhance trust and they have now realized that poverty is their common enemy. Spending more on military capabilities has failed in providing absolute security. Thus, the security of south Asian is now relying more on economic growth and are targeting in reducing poverty. It can be achieved by making the two countries of the region more interdependent and by reducing preoccupation of threat from each other. The interaction between people and SAARC could still be argued as the best hope for the socio-economic development and for the security of the region. South Asia does not only comprise of the large poor population of the world, but also, it is a region in which people live in constant threat of nuclear war. States in South Asia have devised their national security through enhancing their military capabilities, for mass destruction of each other with the justification of the security of their citizens. Policy makers and planner at the upper echelons of states should not develop national security policy with the preoccupation of perceive threats from each other but through the common concern of citizens who seek security from war, religious extremism, economic disparities and social injustice. The bridging of this gap between anxieties of states and citizens is essential for national integrity. So it can be argued that inter-state peace in the region rather than building military stockpiles is the key determinant of national security and human survival.

Moreover, army's repeated involvement in restoring domestic law and order on behest of government overshadowed the growth of law enforcement agencies. Article 245

clause-1 of Pakistan's constitution defines the functions of armed forces. According to this constitution, armed forces of Pakistan under the directions of the Federal Government is subjected to defend Pakistan against external aggression or threat of war and act in aid of civil power when called upon to do so. Therefore, the involvement of armed forces for the undergrowth of law enforcing agencies seems to be undermined and other factors should be analyzed for exploring the answer to this question. The question of what hindered the growth of law enforcing agencies when the state has faced internal instable situations for many time after its emergence must be answered.

The population of Pakistan is approximately 180 million and the police strength is 575000; thus police population ratio in Pakistan is one police official to 304 people. The police population ratio appears excellent but they lack professional training, equipment and forensic services. In recent environment of terrorism, an efficient and trained police service is required to counterterrorism. Police capacity to deliver its services has severely diminished by political manipulation, corruption, ill functioning and weak judicial sphere. The lack of coordination between various kind of policing and intelligence agencies are also responsible for the poor delivery of police service. Military operations could be the substitutes for police actions in some particular circumstances, but to build a stable and constructive internal environment, the police functioning and training should be made more efficient. It can be achieved by implementing the police act of 2002 in its true form and by reforming the criminal justice system. Also, financial and technical aid should be targeted to enhance the counter terrorism capabilities of police services.

Furthermore, the determinant which drives the defense spending in developing countries has to be understood. These factors could be either strategic or economic. There are possibilities that the countries respond to each other's defense spending and involve in arms race or security paradox. Every developing or developed country surely has its own problems which determine the defense spending or bound the cuts in defense spending. These particular problems ranges from civil war, regional wars, militarization of security policy, military regimes, and use of the military to suppress internal voices or conflicts in the involvement of foreign powers. All these circumstances indicate a nonlinear relationship between maintaining a present level of defense spending and to reduce defense spending. The arms transfers have a positive impact when the threat is high, however decrease in defense spending during conflict or civil war may subvert the very basis of the state. There are little evidences that a reduction in defense spending will have economic costs and if the money saved is used elsewhere, it would lead to an improvement in economic performance.

Researchers are also concerned with the opportunity cost of defense spending which is expressed as the trade-off between defense spending and the spending on other public sector or welfare. This particular hypothesis is somewhat problematic as it suggests that if money is not spent on defense, it would be spent on other activities and it does not allow spending on both defense and other activities as the economy grows. Some researchers have found weak results for developing countries and some found no evidence of such a trade-off. Thus, there is no consensus about this type of trade-off among researchers.

1.2.1 Millennium Development Goals

Pakistan along with other 190 countries signed the Millennium Declaration in 2000 to promote social development. Millennium declaration aims at fostering social development through the achievement of Millennium Development Goals (MDGs) with an expectation of more allocation of resources towards the social sector of the economy. Recent security crisis has crowded out the available resources from social sectors to security expenditures. However, the 7th NFC award which has transferred a greater proportion of resources to provinces which increases hopes for better delivery of social services. These hopes seem frustrating due to the flood of 2010 along with the security crisis and debate over the funds for the rehabilitation of the 20 million people and restoring the confidence of people in the state (Dunne, 2008).

Since 2000, social development strategy is aimed at the achievement of MDGs and all policy documents reflect the commitment of Pakistan's government towards the targeted MDGs. Poverty reduction is the first goal of MDGs although it is a bit difficult to estimate poverty rate as different institution define poverty in different terms and the poverty line also varies from one institution to another. Keeping this in view, the standard poverty line which has been adjusted with consumer price index is 1300 for 2010; however poverty has an increasing trend and may increase to 40percent.Literacy rate has increased by 8 percent during 2001-02 to 2004-05 and a 4 percent increase only from 2004-05 to 2008-09.Gender parity (proportion of girls enrollment at different levels of education in comparison with boys) has improved by 8 percent during 2001-02

but it has declined to 3 percent during 2004-05to 2008-09. This trend indicates that education of girls has been unduly effected by security crisis.

The children health indicators improved during the first half but second half shows a little growth in the indicators. The indicators for maternal health have an increasing trend and showed a 7 percent increase from2004-05 to 2008-09.Tap connections for drinking water as a proxy for improved services has an increasing trend of9 percent from 25 percent in 2001-02 to 34 percent in 2004-05 and from 2004-05 to 2008-09.Ithas increased by 1 percentage point. Higher spending on security during recent crisis has certainly reduced public spending on social services and resulted in slow pace of social development. Pakistan therefore is unlikely to meet most of the targeted MDGs by 2015.

1.2.2 Governance

Countries that have developed a proper mechanism for decision making and for implementation can be considered as good governance countries. They provide a protective and favorable environment to investors which lead to an increased economic growth of the country. To measure the quality of governance in Pakistan, this study relies on the above stated aggregate governance indicators of World Bank. This includes the process by which governments are selected, monitored and replaced, the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them. The WGI captures six dimensions of governance for more than 200 countries which are:

a. Voice and accountability
b. Political instability and violence
c. Government effectiveness
d. Regulatory burden
e. Rule of law
f. Control of corruption

Data on these indicators for Pakistan is available at WGI forum. The data varies from –2.50 to+2.50 and the corresponding value for the specified country lies between these values. This value is shown in the percentile which indicates its ranking in the world (near 0 will be considered as bad and near 100 will be considered as good).The WGI data on the control of corruption shows an increasing trend over time and which shows more information available for analysis. The table shows a decreasing trend in the abuse of public power and elite influence in Pakistan society from 1996 to 2003. It started increasing in 2004 but then declined from 2005 to 2007. The society looks under elite capture and public power abuse in2008 and 2009. However, the last column represents the probability of the deviation of governance score from its calculated value.

The WGI data on rule of law is increasing over time showing more information available for analysis. The table shows the highest value in 1996 and then in 2002. The overall data presents a miserable condition of property rights, contract enforcement and excesses of police and courts, which results in high violence and crime as people lose their trust on institutions. Last column represents the probability of deviation of governance score from its calculated value.

The WGI data on regularity quality is increasing over time showing more information available for analysis. The table shows a decreasing trend in government ability to formulate, implement and regulate its policies from 1996 to 2002 and harm private sector development. The government functionaries were able to conduct good practices during 2003-06, which cause private sector to grow. Also, the overall data presents satisfactory results than other variables. Last column represents the probability of deviation of governance score from its calculated value.

The WGI data on government effectiveness is increasing over time showing more information available for analysis. The table shows an increasing trend from 1996 to 2007 with some fluctuations. It represents the good quality of civil bureaucracy and its independence from political pressures; although the values are not so high, but it shows the continuity of government policies. Last two years represent more political influence over state bureaucracy. Last column represents the deviation of governance score.

The WGI data on political stability and absence of violence is presented above. Source column represent the available resources for data collection, which are increasing over time showing more information available for analysis. The values from 1998 to 2002 are somehow better in the whole data set. The overall condition of violence and political instability is high in Pakistan society. Last column represents the probability of deviation of governance score from its calculated value. The WGI data on voice and accountability is increasing over time showing more information available for analysis. The table shows highest values in 1996 and 1998 and an overall increasing trend in data set. This indicates the people participation on electoral process and their freedom of expression. The values are not so high but they are advancing towards a pluralist and

awaked society. Last column represents the probability of deviation of governance score from its calculated value. Good governance of no doubt strengthens the national security by accommodating different elements of national security to enhance the state power where state, society and business work in a harmonious way which will promote unity, prosperity and peace

1.3 PROBLEM STATEMENT

Strong defense plays a key role in any country because internal and external security is very important for the foreign as well as local investment. Assessing the importance of military expenditure for the economy remains an important task, especially in recent years when military expenditure increased while the world faces financial crises and recession. According to Stockholm International Peace Research Institute (SIPRI) 2008, world military expenditure in 2007 was USD 1350 billion which is almost three percent of the world's GDP. In 2006, it increased to seven percent in real terms, and from 1998 to 2007, military expenditure increased by forty six percent in real terms. It was mainly increased due to the gulf war and massive intervention by US in Afghan war.

Pakistan is a less developed country with a ranking of 156th in world per capita Purchasing Power Parity (PPP) adjusted gross national income of USD 2,600, ranking 125thin Human Develop Index (HDI), ranking 145th in peace and stands ranking 35th in defense spending (World Bank , 2010) Defense expenditure of Pakistan remains high and takes a large portion of GDP which is on an average of 5.1 percent from 1980 to

2010 due to longstanding conflicts and arm race with India and its geopolitical position in Afghan war and internal incidents of terrorism.

These high defense spending have attracted many researchers from within (Tahir & Sajid, 1999; Khilji &Mahmood, 1997) and outside the country (Looney, 1998). There are same economic effects of these expenditures and enough literature is available which shows the relationship between defense spending and economic growth and indicates the direction of this relationship. Recently, there is a decline in defense spending from 6.4 percent in 1995 and 4.1 percent in 2000to three percent of GDP in 2010(World Bank, 2010).

High defense spending of Pakistan has remained under criticism by researchers and analysts in many years. Rivalry with India and participation of Pakistan in war on terror affects the defense spending and national security scenario for Pakistan. Pakistan has been involved in non-conventional war from the last three years which has deteriorated the security environment within the borders of Pakistan. Hence, this insecure environment has caused a huge lose both in terms of lives and money. Researchers claimed that Pakistan army is a barrier to sustainable democracy and political system which is necessary for any economy to grow. Khan (2010) argued that civilian governance which is critically important for the foreseeable future needs re-structuring and strengthening of democratic institution. Military establishment has a very strong influence in the political system of Pakistan, while political powers collaborate with the military for gaining short-term advantages. This situation is harmful or detrimental to democracy because then, the military also wants same sort of favor and advantages. For

example, military builds pressure on civil government in budget allocations to grant maximum economic power to them. Due to this cooperation between military and political elites, the chances of corruption and injustice increased. When military is getting extra ordinary economic power and strength, there are chances to use this power to pursue military based interest.

There are many researches on this issue, who found out mixed and inconsistent results. Few researchers have found that defense expenditure has a positive effect on economic growth. Whereas, few researchers have found that there is a negative or insignificant effect of defense expenditure on economic growth. Military spending may have both effects at one time, for example defense expenditure effect positively on saving and investment, but at the same time it affects negatively balance of payment. The military can train soldiers in prospective to enhance the valuable, administrative and technical skills which may be useful in civilian life. It can alsocreate modernizing effect, with modern attitudes and organizational skills use to break up rigidities of social system (Benoit 1978), which causes the positive effect on the economy. On the other hand, these effects may be insignificant because skills possessed by soldiers cannot be useful in civilian industrial sector and places fetter on growth. Therefore, the transferability of skills may be limited and the military may be no more, or less modern in the civil institution.

1.4 OBJECTIVES OF THE STUDY

The general objective of this study is to investigate the impact of defense expenditure on the economic growth in Pakistan.

The specific objectives of this study are:

i) To study the trend of defense expenditure and economic growth.

ii) To investigate the long run relationship between defense expenditure and economic growth.

iii) To investigate the factors that affect defense expenditure in Pakistan.

1.5 SCOPE OF THE STUDY

This study focuses on the investigation of long run relationship between defense expenditure and economic growth in Pakistan. The period of this study is from 1980 to 2010. This time frame of analysis is selected because of two reasons: First, this period shows low economic growth and researcher (Tahir & Sajid, 1999; Khilji & Mahmood, 1997; Khan, 2010) claimed that this was due to high defense burden on the Pakistan economy. Second, few researches are done with this issue and results obtained are inconsistent.

1.6 SIGNIFICANCE OF THE STUDY

Over the years, defense spending of Pakistan has remained an important topic of research. The large size of defense expenditure in the presence of high budget deficits, declining development expenditure and increasing debt services on account of exploding public debt focused the attention of domestic economists on the subject. These factors together with Pakistan's pursuit of nuclear capability, responses (although weak) to increase Indian defense expenditures and prevalence of considerable poverty attracted the attention of researchers outside the country.

The linkages between Pakistan defense spending and its economic growth have been studied and a comprehensive literature is available to analyze the relationship between different economic indicators and defense spending. Pakistan's position as non NATO ally in both Afghan war and its rivalry with India which is now emerging as a dominating economic power in this region became necessary to analyze Pakistan's defense spending in the framework of national security. This study adds a new dimension of national security along with economic growth as secure environments boast both the micro and macro-economic performances of a country.

Additionally, this study will contribute to both practical as well as policy making efforts in Pakistan. At the practical level, it would find out the contribution of defense expenditure, development expenditure and inflation to GDP growth. Defense expenditure and macro-economic stabilization has been a widely debatable issue among researchers across the world. Keeping in view this relationship, a few researchers (Tahir

& Sajid, 1999; Khiliji & Mahmood, 1997) have focused on the situation of Pakistan. The results of the previous studies are inconsistent and controversial. So, the study focus on that, although the civilians of Pakistan are deprived of basic necessities like food hygienic environment, health, education and electricity, yet they spends almost 25 percent of their total expenditure on military expenditure. What are the actual reasons? Why does Pakistan spend almost 25 percent of their total expenditure on defense rather than education, health and other basic necessities?

The present study intends to contribute to the existing literature in three different ways. First, the study uses ARDL technique, which does not impose a priori restriction of exogenous variable and of single cointegration relation inherited in Granger causality approach used in earlier studies. Second, the study incorporates a whole section to analyze historical changes and the possible determining factors of defense spending in Pakistan. The study also takes into account development expenditure not only to understand underlying long-run relation, if any, with the defense expenditure, but also its dynamics with GDP growth. Thirdly, this study uses the most recent annual time series data.

Some reasons for such a huge spending consists of geographical importance, war against terrorism in Afghanistan as an American ally, war against terrorism in Waziristan and Swat, expenditures on maintaining nuclear capability and coping with threats from India. Pakistan and India are two main powers in Asia, and nuclear capability. The arm race between them is driving both countries away from economic development in real terms.

Hence, it is important to study the defense expenditure and examine whether Pakistan needs to increase, decrease or spend with the same pattern on defense.

1.7 ORGANIZATION OF THE STUDY

This study is organized in the following manner. Chapter two reviews the empirical literature on the subject followed by the discussion of trends in GDP growth as well as trends in the defense expenditure of Pakistan. In Chapter three, mathematical and statistical works such as modeling, data analysis, hypothesis testing and interpreting the results will be presented. Chapter four presents the results of ARDL model and their interpretation. Finally, Chapter five elaborates policy implications and suggestion. Moreover, this chapter also provides a comprehensive conclusion and discussions of this study.

1.8 CONCLUSION

This chapter provides a review of the purpose of the study with the focus on the definition of the main questions on the relationship between defense expenditure and economic growth.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the previous studies on defense expenditure and economic growth. It is divided into four different sections. The first section presents the background of the previous studies. The second section consists of the studies which show positive relationship between defense expenditure on economic growth. The third section presents the studies which show negative relationship between defense expenditure and economic growth. The fourth section presents the studies which show insignificant relationship between defense expenditure and economic growth. The fifth section provides economic growth theories. Finally, this section provides the conclusion about the whole discussion.

The relationship between defense expenditure and economic growth is still a highly debatable issue and it is highlighted among the researchers. For this purpose, different econometric models were applied with the specification of different empirical as well as theoretical perspective to examine the relationship between these variables. By using different models and variables, researchers have found different results on the basis of strong evidence and analysis. One of the most controversial and interesting result on the subject is that countries with heavy defense burden tend to show the rapid growth rate, and those with lowest defense burdens tend to show the lowest growth rate (Benoit,

1978). The literature on the effect of military expenditure on economic growth shows positive, negative and insignificant results. As the results above, for the purpose of conviction and better understanding, it will be discussed in three separate sections.

2.2 POSITIVE EFFECTS OF DEFENSE EXPENDITURE ON ECONOMIC GROWTH

Looney (1989) suggests that national income level of an economy can be viewed as the most important determinant to translate the level of military expenditure for that economy. Furthermore, Looney and Frederiksen (1990) examine the economic determinant of military expenditures in Indonesia, Malaysia, South Korea, Thailand, Singapore and Philippines. However, the study which is used to investigate the relation is namely: short run stabilizing model, short run augmentation model and long run distributed lag model. The study has verified the results of a previous study done by Harris on the same topic which was that of the economic variables and the available resources determines the defense spending of these East Asian countries. This paper has found that the defense spending of these countries are directly related to theirs GNP growth. Thus, these countries have increased their military expenditure with an expected increase in their GNP.

Meanwhile, Habibullah *at el.* (2005) investigated the long run causal relationship between defense expenditure and economic growth in 12 Asian countries, namely China, Bangladesh, Indonesia, India, Malaysia, Japan, Philippines, Pakistan, South Korea, Sri Lanka, Singapore and Thailand. This study used annual time series data for the period of 1989 – 2004. The panel cointegration results suggested that the two macro-variable are

cointegrated and there was a long run positive relationship between defense expenditure and economic growth. On the other side, Rashid and Arif (2012) investigated the casual relationship between two variables using unit root test and panel cointegration in 14-developing countries from the period of 1981- 2006. The result suggested that military expenditure is an exogenous variable and it may affect economic activities in these countries. In addition, Bose *et al*. (2003) found positive and significant results between defense expenditure and economic growth by using Feder ram model for a panel of 30 developing countries over the period of 1970 - 1990. However, this study is not much considerable because it was examined by these results in 2003 and data was collected up to 1990; between these 13 years, many issues were faced by these countries which could affect these results.

Khan (2004) investigates the relationship between defense expenditure and economic growth in the case of Pakistan. This study used cointegration techniques and Vector Error Correction Model (VECM). Also, this study used annual time series data from 1951 to 2003 and found long run positive relationship between defense expenditure and economic growth in the case of Pakistan. However, Dakurah *et al*. (2000) studied the impact of defense expenditure on economic growth for 68 developing countries from the period of 1976-1995 using Granger causality test. Their study was found as a unidirectional causality between military spending and economic growth in a number of countries and also found feedback relationship between each other. For the purpose of checking the hypothesis that defense expenditure is a burden on economy, Ando (2009) analyzed the defense expenditure and economic growth using Feder ram model for 109 countries which includes 30 OCED countries. This study used panel data from the

period of 1995 - 2003 to analyze the impact of defense expenditure on economic growth. Ando found the positive impact of defense expenditure on economic growth in all countries. He claims that the hypothesis of defense spending which is a burden on economy is rejected because results shown that there is no negative impact of defense expenditure on the economy.

In this study to find out the effect of defense expenditure on economic growth, arms race between Pakistan and India is also an important issue that affects the defense expenditure of both countries. Yildirim and Ocal (2006) investigated the problem of arms race between Pakistan and India and its effect on economic growth of each country using ARDL model. Their study found a unidirectional relationship between defense expenditure and economic growth in case of both countries. Meanwhile, Halicioglu (2003) studied the relationship between the defense spending and economic growth of Turkey. The study adopted the Atesoglu (2002) approach to examine the causal relation between aggregate defense spending and aggregate output from 1950 - 2002. The study approach was based on macroeconomic framework and multivariate cointegration analysis, and it gives empirical evidences that positive and strong relation exists between defense spending and aggregate output in the case of Turkey from 1950 to 2002. The study clearly indicated that an increase or fall in Turkeys defense spending would cause the same effect on its macroeconomic equilibrium in the long-run. Therefore, the findings of this study were contradicted with another study on the same issue. The difference might come from previous study as it has adopted the neoclassical production function with conventional regression analysis.

However, Wilkin (2004) studied the relationship between defense spending and economic growth for 85 countries from 1988 - 2002. The study used Feder-Ram model for the panel data and fixed effects and random effects tests to obtain empirical results. The result suggested that the defense spending have a mix effect on these 85 countries. Defense spending have a positive effect on economic growth for most of the countries included in study and a negative effect of defense spending on economic growth for very small number of countries. Meanwhile, Cuaresma *et al*. (2004) examined the non-linear effect of defense spending on economic growth for USA from 1929 - 1999. Furthermore, this paper has empirically investigated the defense-growth nexus using annual time series data and applies econometric technique of threshold regression. The study found empirical evidences for USA that the military expenditures do have a level-effect on economic growth. Defense spending has a positive externality effect on economic growth but at lower levels of this expenditure and at a negative externality; it prevails for a higher level of defense spending. The study also suggested a cross country analysis to find the nonlinear effect of defense spending on economic growth. On the other side, Yakovlev (2007) explored the effect of defense spending and arms exports on economic growth by using a panel data of 28 countries from 1965 - 2000. The study used Solow growth model and Barro style regression. It has applied three different tests that consist of fix and random effect test, and Arellano-Bond GMM test to extract empirical results from Solow and Barro regressions. The empirical finding has shown more robust results with Solow growth model than the Barro style regression. The study has explored that defense spending and arms exports are negatively related to economic growth when analyzed separately, but if defense spending and arms export are regressed in pair, their effect appear positive on economic growth. The study also proposed a

number of future researches such as the relation between defense spending and internal threats (security and economic), rule of law and its effect on domestic security and determinants of arms export.

However, Mylonid is (2007) investigates the impacts of European defense spending on its economic growth from 1960 to 2000. The study used the Barro style growth model to find empirical results by using panel data of eight equal intervals each of five year from 1960 to 2000. The study has found that military expenditures have a negative impact on European economic growth. It also indicates that this impact tend to increase over time. In addition, the study also indicated that with the development of Common European Security and Defense Policy, economic growth may lag if defense spending increase. However, Kentor and Kick (2008) examine the capital intensiveness of military organization in developed and less developed countries. Their study used cross sectional panel regression and the causal analysis of developed and less developed countries from 1990-2003. The result has shown that military spending per soldier inhibit the growth of per capita GDP. The finding also shows that arm imports have positive impact on economic growth but only in less developed countries.

In addition, Pradhan (2010) examines the relation between defense spending and economic growth in China, India, Nepal and Pakistan from 1988 - 2007. The study used the integration and cointegration techniques to find the empirical results. The study has found that economic growth and defense spending are integrated and there exists a long run relationship between them in China, India, Nepal and Pakistan at the individual and group level. The study has also found that the defense spending of a particular country

can influence the defense spending of other countries in the panel. Meanwhile, Dunne (2008) investigates the relation between arms spending and economic growth of developing countries and addresses the question whether these spending have a negative effect on economic growth or reducing these spending can give some benefits. The study adopted an exploratory approach to build a conclusion. The available literature on the nexus of defense spending and economic growth varies from empirical methods to reporting of countries to time periods and the consequences in that time periods. The study after evaluating the available literature suggests that there is no significant evidence of any positive effect of defense spending on economic growth for developing countries. The study further argues that reducing defense sending in developing countries could improve their economic performance and it would not appear costly to reduce their defense spending.

One of the most important arguments of those researchers who find positive relationship between defense expenditure and economic growth is the engagement of military into R&D. Hassan *et al*. (2003) study defense expenditure and economic growth in the five South Asian Regional Cooperation Council countries (Pakistan, India, Nepal, Bangladesh and Sri Lanka) from 1985 to 1996. They found that defense expenditure effect positively on the economy because military of that region engages with the development of infrastructure, communication technology, human capital, domestic investment and foreign investment.

Most of the researchers find positive relationship between defense expenditure and economic growth in the case of developing countries. Same studies in the developed or

near to the developed countries also show positive relationship between them. On the other hand, Kollias *et al*. (2004) tested 15 European Union countries using unit root and cointegration test to find out the relationship between defense expenditure and economic growth. The results from Granger causality test suggested that majority of countries show a positive relationship between them. As defense expenditure increases, economic growth also increases. Liu (2011) investigated the relationship of defense spending and economic growth in the case of China from the period 1950 to 2011 using an estimated regression which is based on Barro's Neoclassical growth model and found net positive results of defense expenditure on the economy. He argued that in China, with the increase of defense expenditure, economic growth also increased.

Meanwhile, Ram (2003) analyzed the defense expenditure and economic growth for the purpose of testing the hypothesis of defense expenditure which has a negative relationship with economic growth. His study uses panel data of different countries and argued that there is no evidence of crowding out and opportunity cost, meaning that there is positive relationship between defense expenditure and economic growth. So, finally on the basis of their results, he rejected this alternate hypothesis because of the positive effects of defense expenditure on economic growth. In addition, Brauer (2002) investigated the effect of defense spending on economic development. His analysis was based on the countries that are producer of some form of arms. He argued that if a country engaged in arms production with the help of an already established civilian capacity, it will show a positive impact on the economic growth because during the production process, employment is created. So, when unemployment decreased, poverty decreased and purchasing power also increased which further effect positively on the

economic development. Further, he argued that if a country financed defense expenditure from cutting other public expenditure than on the basis of "Guns or Bread" choice defense, expenditure would have a negative impact on economic growth. However , Sahin and Cetinkaya (2010) investigates the relation between defense spending and its effect on aggregate output for Turkey using monthly data from January 2004 to December 2008. The study focused on Keynesian demand side aspect of defense spending and applies New Keynesian general equilibrium model. This study also applied a number of econometric techniques to extract empirical results. These techniques include unit root tests, Ordinary Least Square, Johansen Co-integration, Granger Causality, and Vector Auto-Regression. The study found that there exist a positive relation between aggregate output (industrial production) and defense spending which is parallel to Keynesian side view of military spending.

The main argument of these researchers demand affects is based on the Keynesian Multiplier effects. Demand effects operate through the level and composition of government expenditures. An exogenous increase in military spending is caused by an increase in demand; thus, if and only if demand increases utilization, growth, employment and purchasing power also increases. Therefore, as a result, poverty decrease, saving increase, investment increase and finally, economic growth increase.

2.3 NEGATIVE EFFECTS OF DEFENSE EXPENDITURE ON ECONOMIC GROWTH

Brasoveanu (2010) investigated the relationship between defense expenditure and economic growth in the case of Romania. In analyzing the data, he used cluster analysis,

quintile analysis, regression technique and Granger causality test. By using these techniques, he found out negative correlation between defense expenditure and economic gr$owth which is due to high proportion of spending on equipment and other operational spending. Meanwhile, Guaresma and Reitschuler (2003) studied defense expenditure and economic growth in the 105 developed as well as developing countries using cointegration analysis on the data from 1960-1990. He found partial negative correlation between defense spending and economic growth for countries with fewer burdens of defense expenditure and found positive correlation for those countries which have heavy defense burden. On the other hand, Gavlin (2003) studied 64 less developed countries (LDC) to analysis the effect of defense expenditure on economic growth and saving - income ratio by using simultaneous equation models. He found negative effect on growth and the saving-income ratio in 64 developing countries. However, Yakovlev (2007) studied the impact of defense expenditure on the economic growth of 64 developing countries from the period of 1968-2005 by using unit root test and regression analysis. He found out that there is a negative relationship between defense expenditure and economic growth.

Most researchers argued that if the low income countries have high defense burden, it must be financed by borrowing, issuing of new notes, and cutting down of other public expenditures. This situation causes the inflation which decreased the saving as well as investment, and further affects the economic growth. In addition, Dunne *et al*. (2002) studied defense expenditure and economic growth in the panel of 11 small industrialized economies using cointegration techniques followed by Vector Error Correction Modeling (VECM). By using annual time series data from 1951 to 2003, he found out

that military expenditure have positive impact on external debt but in real sense, military expenditure have negative impact on the economic growth because most of developing countries are already facing external debt import arms by loan. So, their external debt becomes more increased which further effect the GDP growth.

However, Smaldone (2006) suggests in his study of Africa that the relationship between defense expenditure and economic growth will be heterogeneous, complex and elusive, but think also that the variation can be explained by intervening variables. Heterogeneous means effect may be negative, positive or insignificant. It depends on the geopolitical, geographical and geo economical conditions of any country, but in the case of Africa, negative effect tend to be deeper and wider because Africa faces legitimacy problem, security crises and economic budgetary constraints. Meanwhile, Yildirim and Ocal (2006) investigated the defense expenditure of Turkey by using Feder Ram model over the period of 1951 - 1998. His result suggested that as defense expenditure increases, economic growth decreases. So, there is negative relationship between defense expenditure and economic growth. In addition, Dunne (2010) investigated the defense expenditure and economic growth by focusing on Sub Saharan Africa (SSA) from 1988 - 2006 post cold war periods. He used dynamic first order model and fixed effects panel data which was suggested by Dunne *et al*. (2002). In the final results, he found a negative effect of military burden on the economy.

In short, the defense expenditure is an opportunity cost; however, the government budget constraints required that an increase in military expenditure will be financed by the cuts in other public expenditures. Further, if the government cut in development

expenditures to finance defense, than it need to increase taxes, increase lending, and expand money supply; then by these acts, budget deficit raises, real interest rate increases, saving decreases, investment decreases and finally, economic growth decreases. For the purpose to fulfill this gap, government should be lending money or should increase money supply which would further result to increase in inflation. Increase in inflation causes a decrease in saving and decrease in investment and finally, a negative effect on growth. In other way, as defense expenditure increases to finance defense expenditure, government increases income tax which causes decrease in savings, increase interest rate and decrease investment, and finally, result to a negative effect on growth.

2.4 INSIGNIFICANT EFFECT OF DEFENSE EXPENDITURE ON ECONOMIC GROWTH

Dunne and Uye (2009) studied the impact of defense spending on economic growth over 103 countries, which was almost 39 percent of the whole world. The results were divided into three different categories. They studied defense expenditure and economic growth in 63 cross countries in which 19 percent shows positive impact, 38 percent shows negative impact and 43 percent shows insignificant results. So, the most dominate part is insignificant results. While the study of the rest 40 countries which is referred to a single or small group of countries found that 20 percent countries show positive, 37 percent show negative and 45 percent show insignificant impacts and if concluded, for all 103 countries, 20 percent shows positive, 37 percent shows negative and 44 percent shows insignificant results. Meanwhile, Dunne (2008) studies the military expenditure by using Keynesian frame work and suggested that, military expenditure have probably

the most insignificant effect on economic growth in developing countries and also shows a negative effect and there is no evidence of positive effect.

In addition, Kentor and Kick (2008) studied the defense expenditure and economic growth in different way. They introduced new concept of defense spending per solider and their productivity. They used data of developed and developing countries from the period of 1990 – 2003. By using cross-national casual analysis and panel regression in their countries, they suggested that military expenditure per solider inhabit the growth of per capita GDP, more likely in less developed countries. Furthermore, Gerace (2002) investigated the impact of expenditure on GDP growth in the USA. He divided expenditure into two parts: defense expenditure and non-defense expenditure. By using spectral analysis, he found that defense expenditure shows a negative effect on GDP and could not be used as a stabilization tool. Meanwhile, non-defense expenditure shows positive impact on GDP and can be used as a stabilization tool.

However, Aizenman and Glick (2006) investigated the effect of defense expenditure on economic growth for 90 countries. They suggested that estimated defense expenditure shows a negative and highly insignificant trend. Furthermore, they explain that, by adding threat measure to increase the magnitude of the coefficient on military expenditure as an explanatory variable still not show significance results.

Moreover, Habibullah *et al* (2008) explore the relationship between military expenditure and economic growth in selected Asian countries including Pakistan from 1989 to 2002. They used unit root test, panel cointegration test base on Larson *et al*. (2001) and panel

error correction test based on Pesaran *et al*. (1999). They found that military spending and real GDP per capita are integrated with unit root test. The panel cointegration test shows long run relationship between military spending and economic growth. The panel error correction test shows that military spending and economic growth are not related in Asian countries. However, Aslam (2007) examines the linkages between social expenditures, defense spending and economic growth for 59 countries across different regions from 1972 - 2000. In her study, she finds out the effect of defense expenditure on growth and explores to what extent defense spending are fueled with other social spending using Feder Ram model (1982). Therefore, the empirical results did not show any trade-off between social expenditure and defense expenditure and also does not show any significant productivity impact on economic growth either for Asia region.

Furthermore, Al-Yousif (2002) explores the relationship between economic growth and defense expenditure in six Gulf countries taking a time period from 1975 to 1997. A multi-variant error correction model has been used with Granger causality test to get results. The results indicated that the relationship between growth and defense spending could not be generalized and must be seen in the context of socio-economic conditions of an economy.

Tahir and Sajid (1999) study the causality between defense expenditure and economic growth for Pakistan and LDCs. They have applied Granger causality test on quarterly decomposed series of real defense expenditure and real output from 1961 to 1997 for Pakistan. The results of their paper suggested a feedback relationship in the case of Pakistan, India and Iran. There exists a unidirectional causal relation from GDP to

defense spending for Guatemala and Venezuela. A unidirectional causal relation from defense spending to GDP was found for Turkey. Hence, there exists no relationship between defense expenditure and GDP for Philippines, Ecuador and Sri Lanka.

Along with literature, there is enough empirical literature available too, which shows the relationship between defense expenditure and economic growth and they can be grouped into four categories. First is bi-directional relationship between defense expenditure and economic growth, second is unidirectional relationship from defense expenditure to economic growth, third is unidirectional relationship from economic growth to defense expenditure and last is no relationship between defense expenditure and economic growth.

However, the studies have provided quite interesting results, and at the same time, the results are inconsistent and they suffer from a number of technical weaknesses. First, Looney (1998) used the standard Ganger causality techniques, which imposed the restriction of single cointegration relations on the variables. In practice, there may be more than one cointegration vectors. Moreover Looney's results for the use of defense spending as a macroeconomic stabilization tool suffer from an additional problem of the degree of freedom. The estimated large number of parameters from just 20 observations may hardly be termed conclusive and, therefore, cannot be used for policy purpose due to possible violation of the stability condition of parameters. Second, the studies by Tahir & Sajid (1999) also use Granger causality techniques, which imposed a strong priori assumption of exogenity. Furthermore, the study used a decomposed annual time series data into quarterly observations, which may entail er

Table 1 show the results of the selected studies of defense and growth which concludes on an inconsistent results.

Table 2.1
List of Selected Studies of Defense and Growth

Reference	Model/Sample/Period	Main conclusion
Adams, Behrman and Boldin (1991)	Feder-type 3-sector model, LDC sample, 1974-1986	No effect of defense spending on growth
Alexander (1990)	Feder-type 4-sector model, 9 DCs, 1974-1985	No effect of defense spending on growth
Atesoglu and Mueller (1990)	Feder-type 2-sector model, USA, 1950-1965	Small positive and significant effect of defense spending on growth
Benoit (1973, 1978)	Traditional (ad hoc) models, 44 LDCs, 1950-1965	Positive and significant effect of defense spending on growth.
Biswas (1993)	Traditional and Feder-type 2-sector model, 74 LDCs, 1981-1989	Positive and significant effect of defense spending on growth.
Biswas and Ram (1986)	Traditional and Feder-type 2-sector model, 58 LDCs, 1960-1970 and 1970-1977	No significant effect of defense expenditures on growth
Chowdhury (1991)	Granger causality test, 55 LDCs, Time Series Data	No causality between military expenditure and growth in most countries
Deger (1986a,b)	Traditional (SEM 3-equations) model, 50LDCs, 1965-1973	Positive growth effect of defense spending on growth, but negative indirect and total effect.

Source: This table is adapted from "Handbook on Defense Economics" Table 1, page 255, which mentions 29 selected studies on defense-growth relations.

2.5 THEORETICAL LITERATURE REVIEW

The importance of economic growth and development has always been an interesting topic for economist. Economic growth is a result of greater quantity and better quality of natural, human, capital resources, and technological advances that promote productivity. Kibritcioglu (1997) stated that Adam Smith's (1776) "An Inquiry into the Nature and Causes of the Wealth of Nations" may be seen as a suitable starting point for economic growth theories. Smith (1776) stated that not only capital accumulation but also technological progress and institutional and social factors play a crucial role in the economic development process of a country.

The idea of a long run steady state in the wealth of nations influenced many generations of economists, from David Ricardo to Roy Harrod. Harrod's (1939) and Domar's (1946) Keynesion growth models conceded that factors of production are not substitutable and investment decisions are the functions of the expected demand for goods and services. The subsequent neoclassical growth model was due to Slow (1956), Swan (1956), Cass (1965), and Koopmanas (1965). The standard neoclassical growth model implies that in steady-state equilibrium, the level of GDP per capita will be determined by the prevailing technology and the exogenous rates of saving, population growth and technical progress. They concluded that different saving rates and population growth rates might affect different countries' steady-state levels of per capita income (Dewan and Hussein, 2001).

However, recent growth theories dismissed the standard neoclassical growth model in favor of an exogenous growth model that assumes constant and increasing returns to capital. The critics alleged that the standard neoclassical model implies that countries with the same steady-state capital per-worker but different initial relative factor endowments and per-capita income will grow at different rates to eventually reach the same per-capita income level. One of the major concerns has been the issue of convergence.

The convergence hypothesis later became a major point of disagreement with the subsequent endogenous-growth theory, in particular with Romer (1986) and Lucas (1988). Currently, it is generally accepted that there is more evidence in favor of a "conditional convergence", for example Barro (1991), Mankiw*et al*. (1992) and Barro and Sala-i-Martin (1992). That is, countries with different parameters and different steady-state capital per-worker targets will grow at different rates but those with similar parameters will coverage to reach the same per-capita output level.

2.5.1 Government Expenditure and Economic Growth

In the neoclassical growth models of Slow (1956) and Swan (1956), growth in income per capita in the steady state is exogenously given and is dependent on the exogenous rates of technological progress. Thus, economic growth is invariant to any kind of government policy. Only during the transition of economics to their steady state can economic policies have an effect on rates of growth. However, with the advent of endogenous growth theory that was initiated by the pioneering works of Romer (1986)

and Lucas (1988), the perspective on the role of government has changed dramatically. This model proposed that not only the transaction of growth rates are endogenous, but also the steady state growth rates.

Endogenous growth theory is relevant in explaining the importance of learning-by-doing mechanism via public sector investment in promoting education, through which an economic system may be stimulated to achieve self-sustaining growth. Lucas (1988) argued that investment in education increase the level of human capital. This increases the resource base of the economy, and thus its output. Zagler and Durnecker (2003) provided a theoretical model that examines the effect of government expenditure policy on economic growth by disaggregating the total income expenditure into two broad categories, namely: public expenditure into productive (growth-enhancing) and unproductive (purely consumptive) expenditure.

Apart from overall government expenditure, theoretically different functions may affect economic activity in different ways. Defense expenditure can have an adverse effect on economic growth by crowding-out private investment. Higher defense expenditure results in the distortion of resource allocation, for example the diversion of resource from productive activities to the accumulation of armaments and the maintenance of sizable defense force. According to Benoit (1978), in LDCs, only small percentage of the decrease in defense expenditure if there is any at all, goes to productive investment. Therefore, reducing defense expenditure will not necessarily increase economic growth. He further argued that in LDCs, defense expenditure will increase growth through

different channels; hence, it may contribute to the civilian economy indirectly by providing education, vocational and technical training that can boost human capital.

Defense expenditure can also affect economic growth positively through an expansion of aggregate demand (the keynesian effect). The resulting increase in demand will increase utilization of otherwise idle capital, higher employment and profit, and therefore higher investment, all of which results in economic growth (Abu-Badar and Abu-Qarn, 2003).

2.5.2 Military Keynesianism Hypothesis

Military Keynesianism Hypothesis (MKH) is a point of view that Keynes (1933) defended. The government fiscal policy to large amount of spending on defense is an effort to increase economic activities. In fact, Keynes also advocated that government spending should be used for the purpose of peace and prosperity rather than war (Looney, 1998). In that prospective, military expenditures have positive effect on economic growth. Military Keynesians was further contented with defense expenditure as a stimulator to economic growth by increasing aggregate demand into the market and by using defense as a tool of fiscal planning. However, concerns related with the prolonged school of thought are the interrelated governmental monetary and fiscal policies (e.g. the rate of taxation which should not be increased because of excess public spending on defense). Moreover, the Marxist school of thought was also satisfied with the fact that defense spending is necessary, especially in western countries due to under consumption (Wilkins, 2004).

The economic effects advanced by supporters of military Keynesianism can be broken down into four areas, two on the demand side and two on the supply side. First, on the demand side, increased military demand for goods and services is generated directly by government spending. Second, direct spending induces a multiplier effect of general consumer spending. Therefore, these two effects are directly in line with general Keynesian economic doctrine.

First, on the supply side, the maintenance of a standing army removes many workers from the civilian workforce. In the United States, enlistment is touted as offering direct opportunities for education or skill acquisition. Second, it is argued that military spending on R&D increases the productivity of the civilian sector by generating new infrastructure and advanced technology. Frequently cited examples of technology was developed partly or wholly through military funding but was later applied in civilian settings which include computers, aviation, roads, nuclear power, and the internet.

2.5.3 Forms of Military Keynesianism

Military Keynesianism can be differentiated by three forms. First, there is the differentiation between the use of military spending as 'pump primer', and efforts to achieve long term multiplier effects by the given spending. A government may opt to approve the purchases of fighter planes, warships or other military commodities so as to weather a recession. Alternatively, it may opt to approve the purchase of fighter planes, warships or other military commodities throughout all the years of a given business

cycle. Since the construction of large armament systems is required extensively for planning and research, capitalist states generally prefer to rely on arms' purchases or other military allocations for longer-term macro-economic policymaking and regulation.

A second differentiation that needs to be made is between primary and secondary forms of military Keynesianism. In both cases, the state uses the multiplier mechanism in order to stimulate aggregate demand in the society. But the primary form of military Keynesianism refers to a situation where the state uses its military allocations as the principal means to drive the business cycle. In case of a secondary form of military Keynesianism, the given allocations contributes towards generating additional demand, but not to the extent whereby an economy is fully or primarily driven by the military allocations.

The third differentiation starts from the observation that modern capitalist economies do not function as closed systems but rely on foreign trade and exports as outlets for the sale of a part of their surplus. This general observation applies to the surplus generated in the military sector as well. As the vast amount of data regarding state promotion of arms' exports do confirm, capitalist states actively try to ensure that their armament corporations gain access to import orders from foreign states, and they do so among others in order to generate multiplier effects. Hence, there is a need to also differentiate between the two forms of domestic and 'externalized' military Keynesianism.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter discussed the theoretical framework of the study. Moreover, model specification, source and nature of data, justification of variables and method of analysis is also discussed in this chapter.

3.2 THEORETICAL FRAMEWORK

The use of government expenditure as a fiscal policy tool is well established. The earlier studies on defense expenditure and economic growth have three main arguments. First, Classical and Neoclassical (Solow & Swan, 1956) proposed well-known arguments about crowding out phenomenon which stated that as public expenditure to finance defense expenditure increases, it will cause the government to compensate other public expenditures. Second, keep the total public expenditure fixed, if the government spend more on defense; however, government efforts to spend more on development or infrastructure which is a key point for economic growth are restricted. Third, if the defense spending is financed by the government lending from public and private sector, it will cause budget deficit. Furthermore, the causes of the devaluation of money, increases interest rate and decreases investment which ultimately has an adverse effect on economic activities.

The model used in this study is based on endogenous growth theory. In general form, model can be written as follows.

$$GDP = f(K, L, H) \qquad [3.1]$$

Endogenous growth models developed within the framework of inter-temporal optimizing behavior of national agents represent different intellectual influences. These endogenous growth models achieve positive and constant steady state growth rates both by assuming non-decreasing returns to scale and by endogenizing technological improvements. The broad consensus highlighted in the literature is that a country's growth over a long period is basically determined by three factors, namely; (i) the efficient utilization of the existing stock of resources, (ii) the accumulation of productive resources such as human capital, and (iii) technological progress.

Base on previous studies, theoretical framework and the economic growth theories, the long run relationship between defense expenditure and economic growth as well as other factors are shown in Equation [3.2].

$$GDP = f(DF, DV, INF, SAV) \qquad [3.2]$$

where,

GDP = Gross Domestic Product (percentage)

DF = Defense Expenditure (percentage to GDP)

DV = Development Expenditure (percentage to GDP)

INF = Inflation (percentage)

SAV = National Saving (percentage to GDP)

Equation [3.2] shows that GDP is the function of DF, DV, INF and SAV. Furthermore, by taking natural log (ln), Equation [3.2] has been transformed into Equation [3.3].

$$\ln GDP_t = \beta_0 + \beta_1 \ln DF_t + \beta_2 \ln DV_t + \beta_3 \ln INF_t + \beta_4 \ln SAV_t + \varepsilon_t \quad [3.3]$$

where, β_0 is intercept, β_i (i = 1,2,3,4) are coefficients and ε_t is an error term.

In Equation [3.2], GDP is considered as a dependent variable. Meanwhile, DF, DV, INF and SAV are independent variables.

3.3 JUSTIFICATION OF VARIABLES

3.3.1 Gross Domestic Product

Gross Domestic Product (GDP) is the market values of all officially recognized final goods and services produced within the geo-graphical boundaries of a country. GDP is a key indicator of any country's standard of living. Some scholars also use this variable to look at the living standards of people living in an economy, because it indicates the

fiscal and macroeconomic standards of a country, so there is a strong relation between economic growth and public policy.

DeGrasse (1993) has investigated that there was a positive relationship between military expenditure and economic growth. He argued that defense spending stimulate economic growth because by it, it enhances aggregate demand, creates jobs and increases the purchasing power of the workers. It also has multiplier effect on economic growth. Moreover, Atesoglu (2002) examined the relationship between the defense expenditure and aggregate output in the United State economy, by implementing a quarterly data for the period 1970 to 2000. He found a positive relationship between the variables. Furthermore, in the case of Turkey, Halicioglu (2004) also found a high correlation relationship between the level of economic growth and defense expenditure using data from 1950 to 2002.

3.3.2 Defense Expenditure

In the case of developing countries, the published defense spending should be treated with care because of aggregate budget categories, military assistance and the involvement of military in civil projects. This study is using the data of defense spending compiled by the Handbook of Pakistan Economic Survey on definition provided by the North Atlantic Treaty Organization (NATO) The data on defense spending includes the whole range of current and capital spending on armed forces like the ministry of defense, paramilitary forces, military R&D, operations and maintenance and procurement. It does not involve civil defense spending on previous military activities

and conversion or destruction of weapons. Defense consumes a large portion of the total income of an economy. Therefore, it has been under debated by many scholars whether or not spending on defense is useful or wasteful. The level of defense spending depends upon the regional and geo-strategic condition of a particular country, so a country with more threats will spend more on its defense and vice-versa. However, this is an issue of high consideration for policy analysts.

It is expected that there is a positive relationship between GDP and defense expenditure. Khilji (1997) has explored the impact of defense expenditure on economic growth and other major economic variables in case of Pakistan economy over the period 1972-1995. The result shows that there is positive relationship between the defense burden and GDP growth. Moreover, Larsson *et al*. (2001) have investigated the relationship between defense expenditure and economic growth using cointegration test and their results indicated that economic growth and military expenditure are cointegrated.

3.3.3 Development Expenditure

Development expenditure is the government spending that is allocated for providing infrastructure such as drinking water, irrigation, sewerage, health, transport, education and communications. Development expenditure presents the key role in economic growth. According to the World Bank (2005), development expenditure has decisive role in economic growth or development. Through spending, government preserves and promotes national identity, supplies infrastructure for economic development and provides social services to meet the basic needs of the nation. Development expenditures

are made for the overall development of the country. In term of the relationship between economic growth and government development expenditure, Landau (1993) found a positive and significant effect of military expenditures on growth and development expenditure.

3.3.4 Inflation

Inflation is a persistent rise in the general price level of goods and services in a given period of time. A chief measure of inflation is the inflation rate, which is the annualized percentage change in a general price index (normally, the consumer price index) over time. When the general price level rises, each unit of currency can buy only fewer goods and services. Consequently, inflation also reflects erosion in the purchasing power of money, a loss of real value in the internal medium of exchange and unit of account within the economy. Therefore, it is expected that the relationship between GDP and inflation is negative.

Khan (2004) has investigated the plausibility of using defense expenditure as a macroeconomic stabilization tool (referred as MKH) in the case of Pakistan. His study uses Johansen's co-integration techniques and vector error correction modeling (VECM). Various parametric restrictions on VECM were tested to discern the Granger causal chains among defense spending, development expenditure, inflation and income. Using annual time series data from 1951 to 2003, he found a long-run relationship among the variables and the results tend to favor a long-run bi-directional causality among the variables. Moreover, Datta and Mukhopadhyay (2011) explain the concept of

inflation and economic growth in the case of Malaysia. They argued that one of the most important basic objectives for any countries is to sustain high economic growth together with low inflation. However, there has been considerable debate between structuralists and monetarists on the nature of inflation and economic growth relationship over the past few decades. The structuralists believe that inflation is essential for economic growth, whereas the monetarists see inflation as detrimental to economic growth. Some findings says there is a significant short-run relationship but not in the long-run. Considering all types of findings, this paper investigates the same issue in the economy of Malaysia. The data are taken from IFS, yearly data and methodologies are ADF, PP Unit Root Test, Vector Error Correction, Vector Auto Regression, Impulse response function and Variance Decomposition. According to this study, there exist a short-run causality between the variables and direction of causality from inflation to economic growth but in the long-run economic growth Granger Causes inflation. Furthermore, Kormendi and McGuire (1985) document a negative effect of inflation on economic growth for a cross-section of 47 countries during the period of 1950–1977.Munir*et al.* (2009) examines the issue of the existence of threshold effects in the relationship between inflation rate and growth rate of GDP in the context of Malaysia, using new endogenous threshold autoregressive (TAR) models proposed by Hansen (2000) for estimation and inference. The empirical analysis uses annual data from Malaysia for the period of 1970–2005.The findings clearly suggest that one inflation threshold value (i.e., structural break point) exists for Malaysia; and this implies a non-linear relationship between inflation and growth. The estimated threshold regression model suggests 3.89 percent as the threshold value of inflation rate above which inflation significantly retards

growth rate of GDP. In addition, below the threshold level, there is a statistically significant positive relationship between inflation rate and growth.

3.3.5 Saving

Pakistan's savings efforts are low by developing country standards. In fact, saving as a fraction of the Gross National Product (GNP) is one of the lowest among the developing countries. The current saving rate of about 14 percent of GNP fares badly with 23 percent for other low income developing countries[1] with respect to this, Qurashi (1981) have tested empirically the McKinnon show model and found that financial repression holds domestic saving below the level which would occur under a policy of financial liberalization. In his study, Khan found that: a significant and positive association exists between the real rate of return on deposit and aggregate savings. The interest elasticity of national savings ranges from 0.01 to 0.03 depending upon the sample size. Lewis (1955) elucidated the relationship between savings and economic growth, and in particular, the importance of capital accumulation to a nation. However, an elevated savings rate would contribute to real income growth. The main premise underlying Lewis's assumption is that higher savings rate will invariably increase the rate of investment and thus leads to economic development and growth. Romm (2003), using Vector Error Correction Model (VECM) approach, examines the relationship between savings and growth in South Africa from 1946-1992. The results indicate that there is an indirect effect of private savings growth through the effect of private savings on

[1] Several good comparative studies exist. See for example: Mawell, J.F. (1984). Saving, financial intermediation and economic growth in Asia. *Asian Development Review*, 2(1), 82-91

investment. The paper finds that savings enhanced growth and at the same time growth enhanced savings.

3.4 DATA DESCRIPTION

In this study, annual time series data has been used in the analysis. The data has been taken from Handbook of Statistics on Pakistan Economy and other official documents published by the State Bank of Pakistan, Federal Bureau of Statistic (FBS) and Federal Bureau of Revenue (FBR). This handbook is also available on the official website of the State Bank of Pakistan. The annual time series spinning from 1975 to 2010 are used.

3.5 METHOD OF ANALYSIS

Time series method has been used in the empirical analysis. The standard procedure of the time series method involves the implementation of unit root test and the estimation of long run relationship.

3.5.1 Unit Root Test

Unit root test is used to confirm whether a variable is stationary, $I(0)$ or non-stationary, $I(1)$. Let us consider $Y_t = (GDP, DE, DV, INF, SAV)$ as a stochastic variable with these properties:

Mean: $$\mathrm{E}(Y_t) = \mu \quad [3.4]$$

Variance: $$\mathrm{var}(Y_t) = E(Y_t - \mu)^2 = S^2 \quad [3.5]$$

Covariance $$\gamma_k = \mathrm{E}[(Y_t - \mu)(Y_{t+k} - \mu)] \quad [3.6]$$

where γ_κ is the covariance (or auto covariance) at lag, k is the covariance between the values of Y_t and $Y_{t+k,}$ that is, between two values of k periods apart. If Y_t is related to past value of itself, Y_{t-1}, its relationship can be shown in Equation [3.7].

$$Y_t = \rho Y_{t-1} + \varepsilon_t; |\rho| < 1 \quad [3.7]$$

where ε_t is a white noise error term. Y_t has a unit root if, and only if, $\rho = 1$, that is, in the case of unit root, Equation [3.7] is a random walk model without drift, which is a non-stationary stochastic process. Equation [3.7] can be estimated using OLS and by testing the hypothesis. The null hypothesis is that $\{Y_t\}$ has a unit root: $H_O : \rho = 1$ and $H_1 : \rho \angle 1$ by the usual t test because that test is severely biased in the case of a unit root. Therefore, converting Equation [3.7], Y_{t-1} is subtracted from the both sides of Equation [3.7] to obtain Equation [3.8]

$$Y_t - Y_{t-1} = \rho Y_{t-1} - Y_{t-1} + \varepsilon_t$$

$$= (\rho - 1) Y_{t-1} + \varepsilon_t \qquad [3.8]$$

which can be alternatively written as:

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \qquad [3.9]$$

where $\delta = (\rho - 1)$ and Δ, as usual, is the first different operator. For the purpose of testing unit root, the null hypothesis (H_0) that $\delta = 0$ and the alternative hypothesis (H_1) being that $\delta \neq 0$. If $\delta = 0$, and $\rho = 1$, it has a unit root, means that the time series under consideration is non-stationary. Furthermore, Equation [3.9] becomes Equation [3.10] if $\delta = 0$

$$\Delta Y_t = (Y_t - Y_{t-1}) = \varepsilon_t \qquad [3.10]$$

Since ε_t is a white noise error term, variable Y is stationary, which means that the first differences of a random walk time series are stationary.

To perform unit root test, the estimated $t - value$ of δ in Equation [3.9] is computed to $t-$statistic (τ statistic). This test is known as Dickey-Fuller (DF) test. The actual procedure of implementing the DF test involves several decisions. In discussing the nature of the unit root, process may have no drift, or it may have both deterministic and stochastic trends. To allow for the various possibilities, the DF test is estimated in

three different forms, that is, under three different null hypotheses. Y_t in all three equations are random walk (equation 3.11) with drift (equation 3.12), and deterministic trend (equation 3.13).

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \quad [3.11]$$

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \varepsilon_t \quad [3.12]$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \varepsilon_t \quad [3.13]$$

In this study, ADF method has been employed. Thus, DF test may create a problem of autocorrelation. To tackle autocorrelation problem, therefore, Dickey and Fuller (1981) developed another test called ADF test. This test is conducted by "augmenting" the preceding three equations by adding the lagged values of the dependent variable, ΔY_t. To be specific, it should have Equation [3.14].

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_t + \gamma_1 \Delta Y_{t-1} + \varepsilon_t \quad [3.14]$$

where $|\gamma_1| \angle 1$

Suppose we have Equation [3.14], thus the ADF test consists of estimating Equation [3.15].

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{\rho=1}^{\rho} \alpha_i \Delta Y_{t-\rho} + \varepsilon_t \quad [3.15]$$

where $\rho = 1,2,.....,\rho$

where ε_t is a pure white noise error term. The number of lagged difference term or ρ to be included is often determined empirically. The idea being to include enough terms so that the error term in Equation [3.3] is serially uncorrelated, and unbiased estimate δ can be obtained as an estimate of δ, the coefficient of lagged Y_{t-1}. E-Views have an option that automatically selects the lag length based on Akaike Information Criteria (AIC) and Schwarz Information Criteria (SIC).

3.5.2 Testing For Cointegration

In some cases when we regress I(1) variables together and we do not know that the regressors are I(1), then mostly the t values are high. The high t-values show that all variables are stable, but in reality, the value is high because of common trend in them. So, first need to confirm that all variables should be of same order I (0) or I (1). If I (1), then there is need to have confirm that all the residual of the long run equation should be stationary I(0) to prove that the high t- values are exactly the correct long-run result. If residual are not stationary, it will mean that regression is spurious.

If we regress a non-stationary time series (example GDP) on another non-stationary time series (example DE), the result of regression analysis may produce spurious regression problem. Which means that we may face spurious relationship between GDP and DE or other explanatory variables. Subjecting these time series individually to unit root analysis, we find that series both are *I*(1); series contain a stochastic trend. It is quite

possible that the two series share the same common trend. So, the regression of one on the other will not be necessarily spurious. To be specific, used the Pakistan economic time series data and run the following regression of LGDP on LDE:

$$LGDP_t = \beta_1 + \beta_2 LDE_t + \varepsilon_t \qquad [3.16]$$

where L denotes logarithm. β_2 is the elasticity of the GDP with respect to DE . It can be written as:

$$\varepsilon_t = LGDP_t - \beta_1 - \beta_2 LDE_t \qquad [3.17]$$

where ε_t is a zero mean, I(0) process to unit root analysis and it is stationary; which is $I(0)$. The linear combination cancels out the stochastic trends in the two series. If taking GDP and DE as two $I(1)$ variables, it would be meaningful; however, in this case, the two variables are cointegrated.

Economically, two variables will be cointegrated if they have long-run or equilibrium relationship between them. In fact, economic theory is often expressed in equilibrium terms. In cointegration theory, a regression such as Equation [3.16] is known as a cointegrating regression and the slope parameter β_2 is known as the cointegrating parameter. The concept of cointegration can be extended to a regression model containing *k* regressors. In this study, there are k cointegration parameters.

Furthermore, there are different methods of analyzing long run relationship among the variables. Over the past decade, considerable attention has been paid in empirical analysis to test for the existence of long-run relationship, mainly using cointegration techniques. There have been three main approaches: First, the two-steps residual-based procedure by Engle and Granger (1987) and Phillips and Quliaries (1990)), and the system-based reduced rank regression approach due to Johansen (1991, 1995). Second, procedures such as the variable addition approach of Park (1990), the residual-based procedure for testing the null of cointegration by Shin (1994), and the stochastic common trends (system) approach of Stock and Watson (1988). Third, Auto Regressive Distributed Lag (ARDL) model popularize by Pesaran *et al.* (1999). The first and second testing procedure require the underlying variables to be integrated of the order $I(0)$ or $I(1)$. This inevitably involves a certain degree of pre-testing, and the introduction of a further degree of uncertainty into the analysis of long-run relations. But the third testing procedure is suitable for both order $I(0)$ or $I(1)$. In order to test for the long run relationship between military expenditure and economic growth in this study, ARDL testing approach has been employed. This method is recently used by Hirnissa *et al.* (2012). In fact, the procedure allows for different long-run relationships and short-run dynamics and this is important for the estimation of the equilibrium conditions. In addition, the ARDL technique can be implemented regardless of whether the variables are integrated of order (1) or (0). It can be applied to small finite samples. Therefore, in this study, ARDL method has been used in analyzing long run relationship among GDP, DF, DV, INF and SAV.

ARDL has various advantages. First, this technique is able to examine the presence of short run as well as long run relationship between dependent and independent variable. Second, it takes a sufficient numbers of lags to capture the data generating process in a general to specific modeling framework. Third, it provides robust result in a small sample size. Since the sample size of this study is based on 35 observations, this provides more motivation to adopt this model.

3.5.3 ARDL Bounds Testing Approach

The bound testing is a new approach to tackle the problem of testing the existence of long-run level relationship between a dependent variable and a set of regressors. When it is not known with certainty whether the underlying regressors are trend- or first-difference stationary. The proposed tests are based on standard F-and t-statistics used to test the significance of the lagged levels of the variables in a first-difference regression. The asymptotic distributions of these statistics are non-standard under the null hypothesis and there is no level of relationship that exist between the dependent variable and the included regressors, irrespective of whether the regressors are I(0) or I(1).

The bound testing procedure involves three stages. The first stage is to establish the existence of a long run relationship. This is based on estimating Error Correction Models (ECM) by taking GDP as an independent variable and the following unrestricted ECM is constructed.

$$\Delta Y_t = \beta_0 + \delta_{yy} Y_{t-1} + \delta_{xx} Y_{t-1} + \sum_{i=1}^{\rho-1} \phi_i \Delta Y_{t-1} + \sum_{i=0}^{\rho-1} \phi_i \Delta Y_{t-1} + \varepsilon_t \quad [3.18]$$

where ϕ is short run dynamic coefficient.

The second step is to compute the *F*-test for testing the existence of a long run relationship. The H_0 for no cointegration amongst the variables in Equation [3.18] is

$H_{0:}$ $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$

against the alternative hypothesis that not all of these coefficient are equal to zero:

H_1: $\delta_1 \neq 0,\ \delta_2 \neq 0,\ \delta_3 \neq 0,\ \delta_4 \neq 0,\ \delta_5 \neq$

$$\Delta GDP = \beta_0 + \delta_1 GDP_{t-1} + \delta_2 DF_{t-1} + \delta_3 DV_{t-1} + \delta_4 INF_{t-1} + \delta_5 SAV_{t-1} + \varepsilon_t \quad [3.19]$$

where δ is a long run multiplier

The *F*-test has a non-standard distribution which depends upon whether variables included in the ARDL model are I(0) or I(1) and the number of regressors. Narayan (2004) provided two sets of critical values of bound; one set assuming that all the regressors are I(1) and another set assuming that they all are I(0). The H_0 of cointegration is rejected if the calculated F-test falls above the upper bound. If the computed *F*-test falls below the lower bound, then the H_0 of cointegration cannot be rejected. Finally, the result is inconclusive if it falls in between the lower and upper bound. In such an inconclusive case, the order of integration, I(d) for the explanatory variables must be known before any conclusion can be drawn (Pesaran, 2001).

The third step is to compare the computed *F*- values in the second step with all upper and lower 90, 95 or 99 percent critical values bounds.

3.5.4 Long-Run Relationship Test

Having found that long-run (cointegration) model is estimated in the next proceeded using the following ARDL (q_1, q_2, q_3, q_4) in the Equation [3.20]

$$GDP = \sum_{i=1}^{\rho} n_i \Delta GDP_{t-i} + \sum_{i=0}^{q_1} k_i DF_{t-i} + \sum_{i=0}^{q_2} r_i DV_{t-i} + \sum_{i=0}^{q_3} x_i INF_{t-i} + \sum_{i=0}^{q_4} w_i SAV_{t-1} + \varepsilon t \quad [3.20]$$

All variables are previously defined. Total variables (GDP, DF, DV, INF and SAV) are used. Here ρ and q are calculated from AIC and SIC method.

3.5.5 Diagnostic Tests

To ascertain the goodness of fit of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, function form, normality, and hetroscedasticity associated with the model. The structural stability test is conducted by employing the cumulative sum of recursive residual (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ).

The CUSUM test makes use of the cumulative sum of recursive residual based on the first of n observations and is updated recursively and plotted against break points. If the

plot of CUSUM statistic stays within the critical bounds of five percent significant level, the null hypothesis is that all the coefficient in the model are stable and cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the five percent level of significance: A similar procedure is used to carry out the CUSUMSQ test, which is based on the squared recursive residual.

3.6 CONCLUSTION

This chapter discusses the methodology used in this study. The methodology consists of theoretical framework, model specification, justification of variable, data description and method of analysis. In theatrical framework, this study discusses the MKH and its relationship with MKH. Moreover, the advantages and steps of the ARDL model have been discussed in detail.

CHAPTER FOUR

EMPIRICAL RESULTS

4.1 INTRODUCTION

This chapter presents the empirical results of the time series analysis which was presented in the previous chapter. The empirical findings are divided into four different sections. The first section presents the results of Augmented Dickey – Fuller (ADF) test for stationarity of series. The second section conducts cointegration test based on the Autoregressive Distributed Lag (ARDL) modeling approach. Therefore, the results of the long relationship among the proposed variables are presented in section three. Finally, section four provides discussion on the empirical results.

4.2 DESCRIPTIVE STATISTICS

Table 4.1 shows the results of descriptive statistics. The Results show that in the period of 1975 – 2010, the maximum value of GDP was 9.00 percent, defense expenditure was 7.22 percent, development expenditure was 8.43 percent, inflation was 20.80 percent and savings was 20.78 percent which were recorded. Meanwhile, minimum GDP was 1.60 percent, defense expenditure was 2.44 percent, development expenditure was 0.87 percent inflation was 3.10 and savings was 9.66 percent which were also recorded.

Table 4.1
Descriptive Statistic of the Variables

Variable	Mean	Median	Maximum	Minimum	S.D
GDP	5.21	5.15	9.00	1.60	2.01
DE	5.06	5.40	7.22	2.44	1.47
DEV	4.05	4.11	8.43	0.87	2.29
INF	8.54	8.38	20.80	3.10	3.68
SAV	14.71	14.29	20.78	9.66	2.39

4.3 THE UNIT ROOT TEST

Unit root test is one of the important steps in the analysis of time series data. This test is used to check the stationarity of variable. Table 4.2 shows the results of the unit root test for variables GDP, DE, DV, INF and SAV.

Table 4.2
Results of ADF Unit Root Test

Variable	Level		First Difference		Results
	Intercept	Intercept and trend	Intercept	Intercept and trend	
GDP	-4.49*	-4.45*	-5.93*	-6.01*	I(0)
DE	0.06	-2.30	- 6.18*	-6.73*	I(1)
DV	-1.36	-2.92	-5.46*	-5.41*	I(1)
INF	-3.00*	-2.99*	-7.16*	-7.05*	I(0)
SAV	-3.44*	-3.37*	-7.59*	-7.64*	I(0)

Note: * Stationary at 5 percent critical value (-2.95)

In this study, ADF test has been conducted to determine the order of integration. The results of ADF tests show that at level variables, GDP, INF and SAV are I (0) at five percent significance. While DE and DV are non-stationary and become stationary I(1) in the first difference at five percent significance value.

4.4 ESTIMATION RESULTS OF ARDL MODEL

After performing unit root test, ARDL model was run to choose an optimal model of economic growth. The optimal model is chosen based on the lowest values of AIC and SBC. After running a couple of tentative ARDL models, the ARDL (2, 3, 0, 4, 4) model was chosen because it has the lowest AIC (-51.174) and SBC (-65.098) values. The estimation results of the optimal ARDL model are shown in Table 4.3.

Table 4.3
Optimal ARDL (2, 3, 0, 4, 4) Estimation Results

Regressor	**Coefficient**	**Standard Error**	***t*-ratio**	**Probability**
GDP(-1)	0.115	0.159	0.720	0.484
GDP(-2)	-0.766	0.189	-4.043	0.001*
DV	0.226	0.535	0.421	0.680
DV(-1)	-0.810	0.634	-1.276	0.224
DV(-2)	1.486	0.727	2.041	0.062
DV(-3)	-1.176	0.581	-2.023	0.064
DE	-0.941	0.303	-3.101	0.008*
INF	-0.249	0.081	-3.048	0.009*
INF(-1)	0.260	0.092	2.822	0.014*
INF(-2)	-0.177	0.116	-1.516	0.153
INF(-3)	0.235	0.115	2.051	0.061
INF(-4)	-0.231	0.111	-2.073	0.059
SAV	0.011	0.155	0.075	0.941
SAV(-1)	-0.055	0.155	-0.359	0.725
SAV(-2)	0.445	0.147	3.014	0.010*
SAV(-3)	0.088	0.148	0.597	0.560
SAV(-4)	0.727	0.159	4.554	0.001*

Table 4.3 (Continued)

Regressor	Coefficient	Standard Error	*t*-ratio	Probability
C	7.189	6.659	1.079	0.300
T	-0.439	0.148	-2.968	0.011*
R-Squared	0.887	R-Bar-Squared	0.731	
S.E. of Regression	1.037	F-stat.(18, 13)	5.682	
Mean of Dependent	5.309	S.D. of Dependent	2.009	0.001
Residual Sum of Squares	13.995	Equation Log-likelihood	-32.173	
Akaike Info. Criterion	-51.173	Schwarz Bayesian Criterion	-65.098	
DW-statistic	2.758			

According to the above table, variables GDP (-2), DE, INF, INF (-1), SAV (-2), and SAV(-4) are statistically significant at five percent level of significance. It means that these variables have significant effect on the economic growth of Pakistan. Other variables are not significant at the same level of significance. Overall, the model can be accepted because *F*-statistic (5.682) is greater than *F*-tabulated value at five percent. This proofs that all variables in the model jointly influence economic growth.

4.5 DIAGONOSTIC TESTS

The robustness of the model has been confirmed by diagnostic tests for serial correlation, function form, normality, heterscedasticity, and structural stability for the model. As shown in the Table 4.4, the selected model generally passes all diagnostic tests.

Table 4.4
Diagnostic Test

The selected model : ARDL (2,3,0,4,4)				
Test	H_0	Statistic	*p*-value	Decision
SC	There is no serial correlation in the residual	$x^2 = 8.1004$	0.067	Fail to reject H_0
HE	There is no autoregressive conditional heterscedasticity.	$x^2 = 0.35823$	0.719	fail to reject H_O
NO	Normal distribution	$JB = 0.58067$	0.748	fail to reject H_O
FF	Absence of model misspecification	$x^2 = .073910$	0.794	fail to reject H_O

Note: SC – Serial correlation, HE – Heterscedasticity

The SC result shows that there is no evidence of autocorrelation in the disturbance of error term. The ARCH test result suggests that the errors are homoscedasticity. The model passes the Jarque-Bera normality test suggesting that the errors are normally distributed. However, in the absence of model misspecification hypothesis, it fails at 5 percent level in model. Pesaran *et al*. (1999) also faces a similar problem. They argued that it may be linked to the presence of some non-linear effects or asymmetric in the adjustment of the regress and that their linear specification is incapable of talking into account. However, one possibility would be to switch to a non-linear model.

4.6 ARDL BOUND TEST RESULTS

The *F*-test has a non-standard distribution which depends upon whether the variables which include the ARDL model are I(0) or I(1) and the number of regressors. Pesaran (1999) provides two sets of critical value bound; one set assuming that all regressors are

I(1) and other are all I(0). Table 4.5 shows the upper and lower 90, 95 and 99 percent critical value bound.

Table 4.5
Critical Value Bound

Regressors	**Level of Significance**					
K**	90%		95%		99%	
4	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Critical values*	2.65	3.71	3.70	4.19	3.46	4.65

Note: *The critical value bounds are from Table *F,* restricted intercept and no trend in Pesaran, 1999
**No. of regressors

The null hypothesis of no cointegration is rejected if the calculated *F*-test falls above the upper bound. If the computed *F*-test falls below the lower bound, then the null hypothesis of no cointegration cannot be rejected. Finally, the result is inconclusive if it falls in between the lower and upper bound. The calculated *F*-tests are reported in Table 4.5. It shows that all *F*-values are higher than upper bound critical values at the 10 percent significance level. Thus, the null hypothesis of no cointegration is rejected which means all variables are cointegrated to each other

Table 4.6
F-tests for cointegration

Test	***F*-statistic**	**Log selection**
$F(GDP/DE, DV, INF, SAV)$	5.682	2, 3, 0, 4, 4
$F(DE/GDP, DV, INF, SAV)$	105.173	2, 2, 0, 1, 2
$F(DV/GDP, DE, INF, SAV)$	72.867	1, 0, 0, 1, 0
$F(INF/GDP, DE, DV, SAV)$	4.972	1, 1, 0, 1, 2
$F(SAV/GDP, DE, DV, INF)$	3.804	0, 0, 0, 0, 0

4.7 RESULTS OF LONG RUN RELATIONSHIP

The primary focus of this study is on the long run effects of defense expenditure on economic growth. The empirical results for this model are reported in Table 4.6.

Table 4.7
The Estimated Long-run Coefficients Results

Model: ARDL(2, 3, 0, 4, 4)		
Regressor	Coefficient	*t*-ratio
C	0.4.35	1.125
DF_t	-0.570	$-3.090*$
DV_t	-0.166	-0.402
INF_t	$-.097$	$-.0959$
SAV_t	0.737	$5.120**$

Note: *Negatively significant with respect *t*-value (-1.96)
** Positively significant with respect to t-value (+1.96)

The results of Table 4.6 indicate that DF and SAV are significant at five percent level of significance. The results show that Pakistan defense expenditure is negatively related with GDP growth, but saving is positively related with GDP growth. In addition, this results show that for one percent increase in defense expenditure, there is a decrease in the GDP by 0.57 percent and also for one percent increase in savings, there is an increase in the GDP by 0.73 percent.

The results are similar to the finding of Looney (1995); Tahir and Sajid (1999) and Habibullah *at el*. (2008) stated that defense spending has a negative impact to economic growth. However, results are different from the finding of Khan (2004) and Aslam (2007) that defense spending do not negatively impact economic growth. Those results

are proved that there is long run relationship between defense expenditure and economic growth. Also, Pakistan defense spending has a negative impact on economic growth. In addition, it is also proof that the national saving has positive impact on economic growth and the other two variables development expenditure and inflation have no considerable impact either negatively or positively on economic growth.

4.8 STABILITY TEST

The results of stability test are shown in Figure 4.1 and Figure 4.2. Both cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) indicate the absence of any instability of the coefficients because the plots of these statistic remains within the critical bound of the 5 percent significant level. Hence, these statistics confirms the stability of the long-run coefficient of the GDP function in the model.

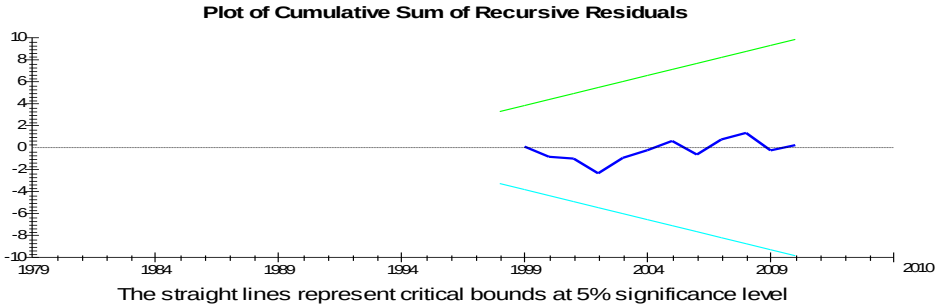

Figure 4.1
Plot of Cumulative Sum of Recursive Residual

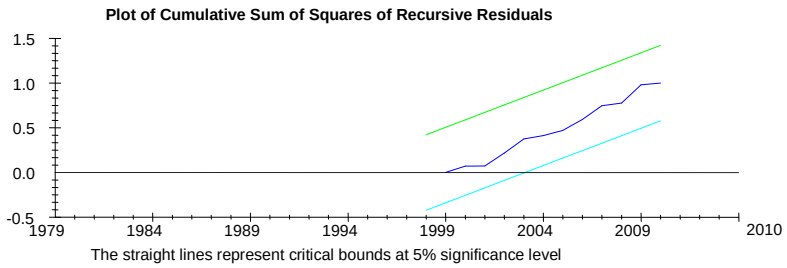

Figure 4.2
Plot of Cumulative Sum of Recursive Residual

4.9 CONCLUSION

This chapter presented the discussion of empirical results. It describes the descriptive statistic such as mean, median, maximum, minimum and standard deviation of each variable. For the purpose of testing the stationarity of variables, the study used ADF unit root test. To examine the cointegration between variables, this study used bound test. To compare the calculated values with upper and lower bound *F*-values, and serial correlation, function form, normality, hetroscedasticity and structural stability of the model study used diagnostic test. To examine the long run relationship between them, all variable tests for estimated long-run coefficient was used. Finally, the stability of data was examined through the cumulative sum of recursive.

CHAPTER FIVE

CONCLUSION AND POLICY IMPLICATION

This chapter presents the summary of the empirical findings and suggests the policy implication. In addition, this chapter also presents limitation and further direction of the study after the policy implication.

5.1 SUMMARY

In traditional Keynesian macroeconomics, many kinds of government expenditure can contribute positively to economic growth. High levels of government consumption are likely to increase employment, profitability, and investment via multiplier effects on aggregate demand. Thus, government expenditure raises aggregate demand, leading to increase output, depending on the size and effectiveness of expenditure multipliers.

The linkages between Pakistan defense spending and its economic growth have been studied and a comprehensive literature is available to analyze the relationship between different economic indicators and defense spending. Pakistan's position as non NATO ally in both Afghan war and its rivalry with India which is now emerging as a dominating economic power in this region became necessary to analyze Pakistan's defense spending in the framework of national security. This study adds a new dimension of national security along with economic growth as secure environments boast both the micro and macro-economic performances of a country.

The result of this study is obtained through the empirical investigation of the model. Empirical investigation is mainly based on ARDL model but some preliminary test is also applied to fulfill the assumptions of ARDL. Variables are stationary but GDP, INF and SAV are stationary in level at five percent significant level and DE, DV are non-stationary at level and become stationary in first difference at five percent significant level. These results were obtained by utilizing ADF unit root test. In addition, the results of cointegration (*F*-test) were shown that all *F*-values are greater than the upper bound value at 10 percent significant level, which means there is cointegration among all variable and the null hypothesis of no cointegration is rejected. The existence of cointegration open up for further investigation because if at that point there is no cointegration, then this model cannot be further investigated. For further investigation to achieve ultimate goal which is to find out long run relationship at this stage, we need to apply same test to confirm the hetroscedasticity, structural stability, serial correlation and normality in the data. Results of this study show that all variables passes test through diagnostic test. Results of long-run coefficient show that out of five variables (GDP, DE, DV, INF, SAV), two variables DE and GDP are statistically significant and have long run relationship. It explains that defense expenditure has a negative impact on economic growth whereas saving has a positive impact on economic growth. If 1 percent increases in defense expenditure cause 0.57 percent decrease in economic growth and one percent increase in saving cause 0.73 percent increases in economic growth. Finally, the result of cumulative sum of recursive residual (CUSUM) test shows that there is no problem with recursive residual, which means that the data is stable.

5.2 CONCLUSION

Several important conclusions can be drawn from the study. The most important to attempts to find out that what are the factors that affect the defense expenditure in Pakistan? Why Pakistan spending high on defense, where it has negative impact on the economic growth.

Take a look the history it is observed that Pakistan and India have been involved in consistent conflict right after their emergence as separated states after Britain partitioned the subcontinent. India remains the source of threat for Pakistani policy makers, and this threat perception has brought both countries into an arms race, where they allocate their defense budget in action-reaction to each other (Hou, 2009). Pakistan right from its creation has an existential threat from India. The psychological and historical lines made India a permanent source of threat for Pakistan. The fact to create a balance between both countries with hard power compels Pakistan by allocates a large portion of its resources for defense. The study also views the defense spending as a necessary expenditure to secure its borders and they are dependent on the strategic needs of a state.

Hollist (1977) has investigated the patterns of defense spending in Pakistan and India from 1949 to 1973 by applying Richardson arms race model. The empirical findings were suggested that the reaction factor for Pakistan and India is not clear and insignificant. The coefficients which were estimated for reaction behavior became negative in most of the models. Oren (1994) explores the defense spending of Pakistan and India from 1947 to 1990 to examine the effect of behind intentions and aggressive

behavior of both countries for their military stockpiles. The author on the basis of empirical results suggests that the coefficient of reactionary arms acquisition for Pakistan and India appear to be negative but the perceived intentions on the other hand play an important role in determining the military stockpiles in both countries. Defense remains an important subject for Pakistan due to historical and psychological reasons and Pakistan find it important to import arms for its defense. Pakistan was made enable by external arm supply to sustain against a larger adversary who could otherwise dominate the subcontinent. Deger and Sen (1990) have studied the defense spending of Pakistan and India from 1960 to 1985 to find the elements of arms race between both countries. They used Richardson arms race model but they accommodated the economic environmental variables within the model. The results suggested that there exists an asymmetric arms race between both neighbor countries where Pakistan is more reactionary to Indian defense spending.

The government and military of Pakistan perceive India as a potential threat to its sovereignty. As in 1980's General Zia-ul-Haq the president and chief of army staff refused to impose any cut on defense expenditure, as he stated that no one can fight a nuclear submarine and jets with sticks so we had to match our arsenal capabilities with our adversaries, Pakistan cannot afford any reduction in defense spending, as you cannot congeal the security threats to Pakistan (Chawala, 2001). There is another opinion that Pakistan is more concerned to Indian defense spending but both Afghan wars and the insurgences in FATA and Waziristan have add new dimensions in the national security of Pakistan. Ayesha (2000) argued that defense spending of Pakistan are enough to meet the national security challenges as it maintain substantial power to combat conventional

war and the nuclear weapons also provide the deterrence against India. In addition, war on terror has opened the unconventional path of war and Pakistan has to maintain the conventional warding off mechanism along with allocating more resources for internal security.

The justification for Pakistan defense spending provided by the decision makers and policy formulation bodies is mostly based on the state's security due to potential threats from inside and outside the territories. Moreover, Ayesha (2001) argued that after the partition of subcontinent in 1947 the rivalry began between Pakistan and India. These two countries have share almost same institutions, budgetary mechanism and political structure but differ in religion, foreign policy and coalition, so both came front to front on many conflicts.

Hou (2010) explained that the Soviet invasion of Afghanistan in 1979 had a profound impact on Pakistan's security as the country emerged as a front-line state in the war against communism and Pakistan involvement in war on terror as an ally of USA uncomfortably placed in a two-front threat scenario such as no other South Asian state has ever experienced. On the other hand, the war on terror in Afghanistan also made Pakistan the frontline ally of the United States and a front line state. During the both Afghan Wars, the United States provided unequivocal support to Pakistan. These wars have made Pakistan's internal security more vulnerable and led to full scale operation in FATA and Waziristan. The country with high defense related budgetary allocations feels more insecure and a country with less defense related budgetary allocations feels more secure. That is common but there are other factors which should be considered in

analyzing defense spending. These are size of economy, currency value, trade, dependency on other countries for arms and tax to GDP ratio. Pakistan's concern about its security is deep rooted in the minds of scholars, politicians and policy makers right from its creation.

Transparency in defense spending means all the arms transfers should be more open and it involves that a regional arms race will less likely to happen. It will bring more international on states to reduce their defense spending. The problem is with the unreliability of the data as the defense spending is mostly hidden and shown under different heads in national accounts. On the other hand, defense spending in developing countries involves high corruption, related with arms trade and making these spending more transparent and accountable will harm the interests of the bureaucrats and military personals involve in the arms trade (Dunne, 2008)

Defense budget of Pakistan is not transparent due to the fact that the military wants secrecy of these spending mostly due to Indian factor. Where some researchers, have argued that military has its own well developed accountable mechanisms, and the defense budget is also presented to parliament. Due to the inevitable role of military in power politics of Pakistan, the civil bureaucracy cannot dictate or supersede military in the defense budgeting process. Ministry of Defense, Ministry of Foreign Affairs and Ministry of Finance constitute the bureaucracy involves in defense decision making. The organizational structure of ministry of defense is twisted to save guard the military interests. Serving and retired military officials occupy central positions in the ministry which make possible to them to control and monitor the work according to the desires of

the military establishment. The civilian officials within the ministry also have enough authority to handle military affairs on their own (Agha, 2001)

The ministry of foreign affairs serves government in locating sources of supply for weapons. The ministry does not have hands-on the procurement process and its importance in arms procurement varies with the heads of government in Pakistan. The ministry of finance is an important body in defense decision-making as it controls the finances of the military establishment but it does not have the influence over the decisions made by military in Pakistan. The ministry of finance faces immense pressure from the military to provide funds for the maintenance of the existing infrastructure and for acquiring new equipments. Given the resource limitation the ministry of finance cannot reduce the funds for military but can delay other funding under its authority (Chawala, 2001).

The country with high defense related budgetary allocations feels more insecure, compare with less defense budgetary allocations. This could be happened but there are other factors which should be considered in analyzing defense spending. These are size of economy, currency value, trade, dependency on other countries for arms and tax to GDP ratio. Pakistan's concern about its security is deep rooted in the minds of scholars, politicians and policy makers right from its creation. In recent circumstances where Pakistan is facing a major hurdle in inviting foreign direct investment and in boosting local investment mainly due to security crisis so defense spending to restore the peace environment could enhance the economic growth. Researchers (Tahir & Sajaid,1999 and Khan,2004) has opposite opinion argued that the state who really wants to enhance the

pace of economic growth should invest more in social services as there are evidences of economic causes in local conflicts. In this regard the state should give more economic opportunities to its people as a solution to reduce the conflicts rather than by investing more on defense.

Pakistan needs to acquire and maintain a high GDP growth to curb poverty. Poverty at its present high level is a threat to national integration and state by fueling the conflict in social structure. As pointed out by former President of Pakistan Musharraf that Pakistan is facing major threat to its national security from inside its territories (The Daily Times, Sep 11, 2004, Lahore). Khan (2004) argued that with the notion that less economic growth is a cause of conflict between different segments and cause an increase in defense spending. Less economic opportunity in most of the areas is compelling people to do crime or to work for the groups with such purposes, but to some extent poverty can be resulted of the terrorism and then a cause of higher incidence of terrorism. Poverty is causing any conflict which interns make a state to spend more on its security. They hold the psychological and religious elements for these conflicts.

A direct and causal relation between poverty and conflict more specifically terrorism is yet to be established but there are evidences that a large number of people who join militant groups are mostly from the lower income segments of population. The majority of the suicide attacks are carried out by the young males who are mostly unemployed and it is an established fact that the young unemployed males are more prone towards militants groups. Therefore state should focus more on its poverty reduction strategies as an essential element for combating terrorism. It is the pressing need to start skill

development programs for young population. These programs should be designed according to the demand of labor for local economies. (SPDC Annual Report, 2010).

Terrorism does have considerable fiscal implications both on revenue and expenditure side. On revenue side, insurgencies reduce the tax base and cause less economic activity which results into the decline of revenues. An economy cannot grow when it is making huge loaning to meet its expenditure. On expenditure side, state has to spend more on defense and to enforce law & order situation in society. This implies that less spending would be made on other activities of state like social services, health and education. It suggests that now fiscal adjustments should be made have to accommodate the relief and reconstruction costs too. Peaceful environment is essential for an economy to grow. Why would an investor invest when there is a high risk ratio? A secure environment can ensure the development of any business. Security crisis along with short supply of energy including gas and power load shedding are the major factors which affect the private investment and economic growth. A decline in investment and economic growth will surely lead the economy towards greater unemployment and less economic activity which may make security situation worsen (SPDC Annual Report, 2010).

Pakistan's economy has been facing many challenges, such as low economic growth, declining investment, high trends in inflation and increasing burden of fiscal and current account deficits. The GDP growth of Pakistan has shown a pyramidal trend over the past ten years. It was at a low rate of 2 percent in 2001 which reached to a peak of 9 percent in 2005 and declined to 1.2 percent in 2009.

An improvement has been observed in 2010. Investment followed the similar trend. Investment as a percent of GDP was 15.8 in 2001 which reached to 20.9 in 2007 and then declined to 15 in 2010. Exports declined from 13 percent of GDP in 2006 to 9.2 percent in 2010. The current account deficit reached to disturbing level of 8.5 percent of GDP in 2008 which led Pakistan to knock the doors of IMF for emergency assistance to avoid a total melt-down of the foreign exchange position and to keep a healthy economic activity. The economy also disrupted from growing inflation where CPI reached a peak level of 20.8 percent in 2009. The table below shows the performances of major economic indicators. In particular the overall situation is leading towards a substantial increase in poverty. According to the World Economic Forum, Pakistan ranked 113 out of 130 countries in 2009 as a tourist destination.

5.3 POLICY IMPLICATIONS

In accordance with the objectives of this study, several policy implications emerged from the analysis. Both India and Pakistan are large markets with great economic opportunities but the economic relations between them have never been progressive. Therefore, reduced bilateral trade, higher military expenditure, less development expenditure and less general trade openness are all conflict enhancing elements. Trade can be increased with India to reduce threat perception and rivalry. India gave the Most Favored Nation (MFN) status to Pakistan but Pakistan still has not been able to reciprocate it due to its concerns. If Pakistan's concerns are addressed by the other side then more trade between both countries will improve the political and economic space to

deal with the issues, which may in turn pave a way towards mutual trust and a negotiated stop on arms race.

1. Defense no doubt is a vital element of national security but policy makers should consider for economic, social, energy and other elements of national security. Defense spending is recently high due to the non-traditional warfare but it should be regulated in order to avoid the security paradox. The defense budget should be made transparent and accountable. The defense budget should come under proper heading in annual budget sheet.

2. Pakistan needs to acquire and maintain a high GDP growth to increase the pace of development and to alleviate poverty. Poverty at its present high level is a threat to state and national integration by fueling the conflict in social structures. Although the link between poverty and terrorism is yet to be established but the radical or extremist organizations can use this poverty to set up their roots in poor classes of society. Pakistan should focus more on social sector where policies are meant to enhance education, health and creating job opportunities for a large portion of population.

   The focus should be on

a. Free, fair and fast judicial system
b. Immediate improvement of governance
c. Empower private sector
d. Targeted subsidies

e. Reduce the political risk premium of the country by reducing tensions and generating reconciliation
f. Export push
g. Public private partnerships for infrastructure and services
h. Ensuring energy, water and food security
i. Optimal use of large human resource
j. Expansion of tax base
k. Proper management & promotion of Agri. sector
l. Continued encouragement for provincial control in economic matters

3. To resolve local agitations and non-traditional security threats, strong political is compulsory along with good military and government co-ordination. Involving local stakeholders and political personalities and Maliks of tribal areas rather than setting huge military operation should start dialogues and negotiations. Launching military operations within the territories of countries can produce more security dilemmas and poor image of security personals among public. Investing more on internal security agencies and on intelligence agencies can also reduce the internal security concerns.

4. Pakistan strategic sensitivity is increasing on western border due to low intensity warfare and cross bordering which is changing the national security strategy. The results can be more hazardous after the exit of NATO forces from Afghanistan as Pakistan has faced already sensitivity on its eastern border. Economy has to face huge burden for sustaining these strategic sensitivities, by this the ties with Afghan government should be re-affirm and Taliban should be call for negotiations as stake-holders of this whole process.

5.4 LIMITATION OF THE STUDY

The findings in this study are subjected to several limitations. Firstly, study specify ARDL model to find out only long run relationship rather than both long run and sort run relationship between GDP growth, defense spending, national savings, development expenditure and inflation. Secondly, only four variables are used in this study to check the affect on economic growth namely defense expenditure, development expenditure, national saving and inflation. In addition, in this study more variable can include to make this model stronger. Moreover, savings ratio is affected positively by the defense ratio, and negatively by the inflation rate. The Pakistani defense burden is impacted negatively by the Indian defense burden and positively by the government budget. When all three equations are estimated as a system to account for feedback and covariance between these equations, these effects are diminished and go down in statistical significance.

5.5 SUGGESTION FOR FURTHER STUDIES

The empirical work in our study was done on the macroeconomic level, while the analysis of mechanism through which fiscal policy and government expenditures become effective should involve mostly microeconomic investigation. Also, macroeconomic analysis should be extended to include a more detailed breakdown of fiscal policy and government expenditure by functions and by type. Such a breakdown would allow extension of the analysis and distinguish among the impacts of the investment in human capital and different current expenditures on growth.

In our study, we focus on a few types of government expenditure as mentioned earlier. Therefore, for further studies, perhaps a richer model can be developed that incorporates different types of government expenditure. Future research efforts should be geared to understanding more clearly the determinants of defense expenditures with explicit recognition of the strategic environment that Pakistan finds itself. This would include endogenising India's strategic considerations. Also the effect of the military complex on political stability/instability in the country and the latter's effect on economic growth would have to be uncovered. All this implies the analysis of more complex interrelationship. Hopefully, such an analysis will also be more intellectually satisfying.

REFERENCES

Abbas, H. (2011). Reforming Pakistan‘s police and law enforcement infrastructure is it too flawed to fix?. *Special Report 266 United States Institute of Peace.*

Atesoglu, H. S. (2002). Defense Spending Promotes Aggregate Output in the United States Evidence from Cointegration Analysis. *Defense and Peace Economics, 13*(1), 55- 60.

Abu-Bader, S. and Abu-Qarn, A.S. (2003). Government expenditure, military spending and economic growth: causality evidence from Egypt, Israel and Syria. *Journal of Policy Modeling,* 25 (1), 567-583.

Agha, A.S. (2001). Pakistan’s arm procurement and military build-up 1977-1999. *New York: Palgrave.*

Aizenman, J., & Glick, R. (2006). Military expenditures, threats, and growth. *Journal of International Trade & Economic Development*. 15(2), 129-155.

Al-Yousif (2002). Defense Spending and Economic Growth: Some empirical evidence from the Arab Gulf Region. *Defense and Peace Economics*, 13(3), 187-197.

Ali, H. (2007). Military expenditures and inequality: empirical evidence from global data. *Defense and Peace Economics*, 18(6), 519-535.

Ando, S. (2009).The impact of defense expenditure on economic growth: panel data analysis based on the Feder ram model. *The International Journal of Economic Policy Studies*, 4(8), 23-32.

Aslam, R. (2007). Measuring the peace dividend: Evidence from developing countries. *Defense and Peace Economics*, 18(1), 39-52.

Atesoglu, H.S. (2002). Defense spending promotes aggregate output in the United States – evidence from cointegration analysis. *Defense and Peace Economics,* 13(1): 55–60.

Ayesha, S.A. (2000). Defense a public good? A case study of Pakistan's military expenditure, 1982-99. *Regional Centre for Strategic Studies,* 12(4), 123-156.

Batchelor, P. Dunne, P. and Lam, G.(2002) The Demand for Military Spending in South Africa. *Journal of Peace Research.*39 (3), 339-354.

Benoit, E (1978). Growth and defense in developing countries. *Economic Development and Cultural Change,* 26 (1), 261-80.

Biswas, B. and Ram, R. (1986). Military expenditure and economic growth in LDCs: an augmented model and further evidence, *Economic Development and Cultural Change*, 34(2), 361-372.

Bose, N., Haque, E., Osborn, D. (2003), "Public expenditure and economic growth: A disaggregated analysis for developing countries", available at http://www.socialsciences.manchester.ac.uk/cgbcr/dpcgbcr/dpcgbcr30

Brasoveanu, L.O. (2010).The impact of defense expenditure on economic growth. *Romanian Journal of Economic Forecasting,* 4(1), 213-234.

Barro, R.J. (1991). Economic growth in a cross section of countries. *Quarterly Journal of Economics,* 106(2), 404-443.

Barro, R.J. and Sala-i-Martin, X. (1992). Public finance in models of economic growth. *Review of Economic Studies* 59, 645-661.

Brauer, J. (2002). Survey and review of the defense economics literature on Greece and Turkey: What have we learned? *Defense and Peace Economics,* 13(2), 85-107.

Chowdhury, A.R. (1981). A causal analysis of defense spending and economic growth, *The Journal of Conflict Resolution*, 35(1), 80-97.

Chen, S. & Feffer, J. (2009). China's military spending: Soft rise or hard threat. *Asian Perspective,* 33 (4) 47-67.

Chung, N.L., Bwo, N.H., & Chin, W.Y. (2005). Defense spending and economic growth across the Taiwan straits: a threshold regression model. *Defense and Peace Economics,* 16 (1), 45-57.

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

Cuaresma, J., Crespo, D; & Gerhard, F. (2004). A non-linear defense growth nexus? Evidence from the US economy. *Defense and Peace economics,* 15 (1), 71-82.

Daley, Ryan P. (2008). Causality between defense spending GDP and economic growth. *Bryant Economic Research Paper,* 1(2),1-18.

Dakurah, A.H. & Davies, P.S. (2012). Defense spending and economic growth in developing countries: a causality analysis. *Department of Agriculture and Resource Economics* Colorado State University Fort Collins, Colorado, working paper series No.117.

Dakurah, A.H., Davies, S.P. and Sampath, R.K. (2000). Defense spending and economic growth in developing countries: a causality analysis, *Journal of Policy Modeling*, 23, 651-658.

DeGrasse, R.W.J. (1993) Military expansion economic decline: The impact of military spending on U.S. *economic performance. Armonk, N.Y: M.E. Sharpe*

Dixit, A. (2007).Evaluating recipes for development Success. *The World Bank Research Observer*, 22(2), 131-157.

Dickey, D. and Fuller, W.A. (1981). Likelihood ratio statistics for autoregressive time series with a Unit Root. Econometrica, 49, 1057-72.

Dunne, JP. Nikolaidou, E and Smith, R (2002) .Military Spending, investment and economic growth in small industrializing economies. *The South African Journal of Economics*, 70(5), 789-809.

Dunne, JP, Nikolaiduo, E. and Smith, R. (2002). Military spending, investment and economic growth in small industrializing economies. *The South African Journal of Economics*, 70(5), 212-234.

Dunne, J. P. (2008). Does high spending on arms reduce economic growth? A Review of Research. *Oxfam Revised Report no 3.*

Dunne, J.P. (2010). Military spending and economic growth in Sub Saharan Africa. *School of Economics*, university of the West of England, Bristol BS 161 QY, UK.

Dunne, J.P., & Uye. (2009). Military spending and development. Chapter in Tan, Andrew (forthcoming 2009) The Global Arms Trade. Europa / Routledge (London). Version available at http://carecon.org.uk/DPs/0902.pdf

Dunne, J.P. & Coulomb. (2009).Peace, War and International Security: Economic Theories: Chapter 2 in Jacques Fontanel and Manas Chatterji (eds) *War Peace and Security*. Emerald: Bingley, 13-36..ISBN 978-0-4445-3244-2. Version available at http://carecon.org.uk/DPs/0803.pdf

Dunne, J.P; & Uye, M. (2008). Does high spending on arms reduce economic growth? *A Review of Research*" Report for Oxfam. March 2008.

Dunne, J.P., & Perlo, F.S. (2003). The demand for military spending in developing countries. *International Review of Applied Economics*, 17(1), 23-48.

Deger, S. (1986). Economic development and defense expenditure, *Economic Development and Culture Change*, 35,179-196.

Deger, S. and Sen, S. (1990). Military Security and the Economy: Defense Expenditure in India and Pakistan.

Datta, K and Mukhopadhyay, C. (2011). Relationship between inflation and economic growth: An econometric review. International Proceeding of Economics Development and Research, 4, 415.

Engle, R.F and Granger, C.W.J (1987). Co-integration and error correction: Representation estimation and testing. Econometrica, 55(2), 251-276.

Faini, R., Annez, P. and Taylor, L. (1984). Defense spending, economic structure and growth: evidence among countries and over time, *Economic Development and Culture Change*, 32, 487-498.

Frederiksen, P.C. (1991). Economic growth and defense spending: evidence on causality for selected Asian countries, *Journal of Philippine Development*, 18(1), 131-147.

Frederiksen, P.C. and LaCivita, C.J. (1987). Defense spending and economic growth: time series evidence on causality for the Philippines, 1956-82, *Journal of Philippine Development*, 14(2), 354-360.

Frederiksen, P.C. and McNab, R. (2001). The Relationship between defense spending and economic growth: a granger causality analysis for Malaysia, 1961 to 1999, *STRATEGI: Journal of Strategic Studies on International Relations*, 9, 63-71.

Galvin, H. (2003). The impact of defense spending on the economic growth of developing countries: A cross section study. *Defense and Peace economics*, 14(1), 51-59.

Gerace, M.P. (2002).US military expenditures and economic growth: Some evidence from spectral methods. *Defense and Peace Economics*, 13 (1): 1-11.

Guaresma, J. Reitschuler, G. (2003), "Guns or Butter?" Revisited: robustness and nonlinearity issues in the defense-growth nexus, working paper No: 0310, *Department of Economics,* University of Vienna.

Halicioglu, F. (2003). An econometric analysis of the effects of aggregate defense spending onaggregate output. METU International Conference in Economics / VII September 6-9, 2003, Ankara, Turkey.

Hausmann, R., B. Klinger., & R. Wagner. (2008).Doing Growth Diagnostics in Practice: A 'Mindbook ,Center for International Development Working Paper No. 177, Harvard University

Habibullah, M.S., Law, S.H., Dayang, A.M. (2008). Defense spending and economic growth in Asian economies: a panel error-correction approach: Munich Personal RePEc Archive, *MPRA Paper* No. 12105, 12/ 2008.

Hassan, M.K., Waheeduzzaman, M. & Rahman. A. (2003). Defense expenditure and economic growth in the SAARC countries, *The Journal of Political, Social and Economic Studies*, 28(3), 275-293.

Hartley, K. and Sandler, T 1995, *Handbook of Defense Economics*, Volume 1, Elsevier Science B. V. Amsterdam, The Netherlands.

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.

Hendry, D.F. Pagam, A.R and Sargan, J.D (1986). Dynamic specification, Hand book of econometric II

Hou, Na. (2009). Arms race, military expenditure and economic growth in India. PhD Thesis, *Department of Economics,* The University of Birmingham.

Hollist, W. L. (1977). Alternative explanations of competitive arms processes: Tests on four pairs of nations. *American Journal of Political Science*, 21(2), 313-340.

Hussain, A. (2007). Human security, economic development and the peace process in south Asia: Non-traditional and human security in south Asia. *IRS, Pan Graphics (Pvt) Ltd, Islamabad*.

Harrod, R. (1939). An easy in dynamic theory. *Economic Journal*. 49(1), 14-33.

Joerding, W. (1986). Economic growth and defense spending: Granger causality. *Journal of Development Economics,* 21, 35-40.

Johansen, S. (1995). Likelihood-based inference in cointegrated vector autoregressive models, Oxford: Oxford University Press.

Johansen, S. (1988) Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control,* 12, 511-526.

Kentor, J; & Kick, E. (2008). Bringing the military back In: Military expenditure and economic growth 1990 to 2003. *Journal of World-Systems Research*,14(2),142-172.

Kapstein, Ethen. B (1992), The political economy of national security, *McGraw-Hill.10.*

Kalyoncu, H. and Yucel, F. (2006). An analytical approach on defense expenditure and economic growth: the case of Turkey and Greece, *Journal of Economic Studies*, 33(5), 336-343.

Keynes, John (1933), " An open Letter to President Roosevelt"

Khan, M.H. (2004). Defense expenditure and macroeconomic stabilization: causality evidence from Pakistan. *SBP working paper series*, state bank of Pakistan. www.sbp.org.pk

Khan, S. R.(2011).Growth Diagnostics: Explaining Pakistan's lagging economic growth, *Global Economy Journal*, 11 (4).

Khan, S. R. (2007). "Pakistan's economy since 1999: Has there been real progress. *South Asia Economic Journal*, 8(1).

Kollias, C., Manolas, G. and Paleologou, S.Z. (2004). Defense expenditure and economic growth in the European Union: a causality analysis, *Journal of Policy Modeling*, 26, 553-569.

Khilji, N.M. and Mahmood, A. (1997) Military expenditure and economic growth in Pakistan. *The Pakistan Development Review*, 36(411), 791-808.

Lai, C. L., Huang, B. N. & Yang, C. W. (2005) Defense spending and economic growth across the Taiwan straits: a threshold regression model. *Defense and Peace Economics.* 16 (1) 45-57.

Landau D. (1993) .The economic impact of military expenditure. *Policy Research Department*, The World Bank, 12(3), 1-12.

Larsson, R., Lyhagen, J. and Lothgren, M. (2001) Likelihood-based cointegration tests in heterogenous panels. Econometrics Journal 4, 109-142.

Liu, D. G .O. (2011). The military expenditure –Economic growth NEXUS: Evidence from China 1950-2011. *Department of Economics and Finance*, Brunel University, Uxbridge UB8 3 PH.

Looney, Robert. E. (1995). Defense expenditure and saving in Pakistan: Do allocation to the military reduce national saving? *Saving and Development*, 19(2), 213-230.

Looney, Robert. E and Frederiksen, P.C.(1990). The economic determinants of military expenditures in selected Asian countries. *Contemporary South-east Asia*, 11(4), 265-277.

Loney, R.E. (1998). Defense expenditure and macroeconomic stabilization in Pakistan: A test of the military Keynesianism hypothesis, *RISEC* 45(4), 599-613.

Loney, R.E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22: 3-42.

Mylonidis, N. (2007). Revisiting the nexus between military spending and growth in the European Union. *10th Annual International Conference on Economics and Security*.

Mankiw, G., Romer, D. and Weil, D. (1992). A contribution to the Empirics of economic growth. *Quarterly Journal of Economics* 107, 407-437.

Munir, Q; Mansur. K and Furuoka, F. (2009). Inflation and economic growth in Malaysia: A threshold regression approach. ASEAN Economic Bulletin, 26(2), 180-193.

Oren, I. (1994). The Indo-Pakistani arms competition: A deductive and statistical analysis. *Journal of Conflict Resolution*, 38 (2), 185-214.

Pesaran, H.M. Shin, Y and Smith, J.R (1999). Bond testing approach to the analysis of long run relationship. *Journal of the American Statistical Association*, 94,621- 634.

Pradhan, R. P. (2010). Defense spending and economic growth in China, India, Nepal and Pakistan: Evidence from Cointegrated Panel Analysis. *International Journal of Economics and Finance,* 2(4), 324-342.

Qurashi, Z.M. (1981). Household saving in Pakistan: Same findings from time series data. *Pakistan Development Review*, 20(4), 112-134.

Rashid, A.K.M., & Arif, M.Z.O. (2012). Does military expenditure influence economic growth in developing countries? *International refereed journal*, 3(3), 12-23.

Romm, A. T. (2003). The Relationship between Savings and Growth in South Africa: An Empirical Study. TIPS/DPRU Forum 2003.

Ram, R. (2003). Defense expenditure and economic growth: Evidence from recent cross country panel data, Chapter in Attiat F and Richard J Cebula. *The Elgar Companion to Public Economics: Empirical Public Economics*, 3(2), 166-198.

Romer, P. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5): 1002-1037.

Sandler, T; & Hartley, K (1995), The Economics of Defense, Cambridge University Press.35-40.

Sahin, A & Cetinkaya, M. (2010). New evidence for Turkey on the relationship between defense spending and aggregate output. *European Journal of Social Sciences*, 13 (1), 436-466.

Sezghin, S., Yildirim, J. (2002).The Demand for Turkish Defense Expenditure. *Defense and Peace Economics*, 13 (2): 121-128.

Shambaugh, D. (2002). Modernizing China's Military. Progress, Problems, and Prospects. Berkeley, Los Angeles and London: University of California Press.

Shin, Y (1994), A residual based test of the null of cointegration against the alternative of no cointegration. *Econometric theory*, 10(1), 91-115.

SIPRI (Stockholm International Peace Research Institute), various years. *Yearbooks World Armament and Disarmament.* Oxford: Oxford University Press.

Smaldone, J. P. (2006). African military spending: Defense versus development. *African Security Review*, 15(4), 18-32.

Social Development in Pakistan. (2010). Social impact of security crisis. *Social Policy and Development Centre (SPDC), Annual Report.*

Stock, J and Watson, M (1988). Testing for common trends. *Journal of the American Statistical Association*, 83, 1097–1107.

Solow, R. M. (1956). A contribution of the theory of economic growth. *Quarterly Journal of Economics* 70: 65-9.

Swan, T.W. (1956). Economic growth capital accumulation. *Economic record*, 36, 334-361.

Tahir, R; & Sajid, G. M. (1999). Defense spending and economic growth in less developed countries: Re-examining the issue of causality", *Government College Economic journal*, 32(1&2), 27-39.

Wilkins, N. (2004). Defense expenditure and economic growth: Evidence from a panel of 85 Countries. *School of Finance and Economics*, University of Technology, Sydney, available at http://cama.anu.edu.au/macroworkshop/Nigel%20Wilkins

Wolde-Rufael, Y. (2001). Causality between defense spending and economic growth - The case of mainland China: a comment. *Journal of Economic Studies*. 28(3) 227-3.

Yakovlev, Pavel (2007) Arms Trade, Military Spending and Economic Growth, *Defense and Peace Economics*, 18(4), 317-338.

Yildirim, J. and Ocal, N. (2006). Arms race and economic growth: the case of India and Pakistan. *Defense and Peace Economics*, 17, 37-45.

Zegler, M. and Durnecker, G. (2003). Fiscal policy and economic growth. *Journal of Economic survey*, 17(3), 397-418.