Impact of Government Spending on Economic Growth: An Empirical Study of Federal and Provincial Spending of Pakistan

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CERTIFICATE

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TO

MY BELOVED PARENTS

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SHAHID MAHMOOD

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ABSTRACT

The role of government spending to stimulate the economic growth has been a debatable issue among the economic scholars and policy makers. This study investigates relationship between government spending (Federal vs Provincial) and the economic growth of Pakistan over the time period of 1979-2015. Pesaran et al. (2001) developed co-integration technique called as Autoregressive Distributed Lag Model (ARDL) is applied for estimation. The results of the study find that government spending has long run impact on the economic growth. Moreover, spending by provincial governments in Pakistan has positive impact on economic growth. Conversely, federal spending fails to have direct positive relationship with economic growth. However, it may have spillover impact on private investment which has positive association with economic growth according to findings of this study. The results of the study suggest that provincial spending is more beneficial for economy as compared to federal spending. The study concludes that, 18th Amendment in Constitution of Pakistan and 7th National Finance Commission Award through which resources and responsibilities of provinces have been increased are supportive for the economic growth of Pakistan.

LIST OF ABBREVATIONS AND ACRONYMS

NFC	National Finance Commission
BE	Budget Estimate
PSDP	Public Sector Development Programme
ARDL	Auto Regressive Distributive Lag
PSE	Public Sector Enterprises
VECM	Vector Error Correction Model
UECM	Unrestricted Error Correction Model
OECD	Organization for Economic Cooperation and Development
SIC	Schwarz Information Criterion
VAR	Vector Autoregressive Model
AIC	Akaike Information Criterion
FED	Federal Excise Duty
IMF	International Monetary Fund
GDP	Gross Domestic Product
FIML	Full Information Maximum Likelihood

CHAPTER I

INTRODUCTION

1.1 Background of the Study

It is often argued that government spending contributes to the productive potential of an economy which subsequently plays significant role in determining the national income of a country. On the other hand, a growing government is seen to have harmful effects on the economy because of the sources used to finance government expenditures—taxes, borrowing or printing money. For that reason a significant volume of economic literature has investigated the role of public expenditures in economic growth of a country but is still inconclusive about whether government spending has positive, negative or insignificant effect on economic growth. Advocates of the positive view of public expenditures [for example, Arrow and Kurz (1970) and Barro (1990)] argue that government spending augment private sector productivity which subsequently increases economic growth. This strand of literature argues that public spending generates positive spillovers effects in the economy by providing public goods like health, education, research and physical infrastructure facilities. This may lead to crowd in private investment and eventually will effect economic growth positively. On the contrary, some studies have come up with opposite findings regarding the relationship between government spending and economic growth and raise question about the significance and efficiency of public spending [Landau (1983), Abu-Bader et al. (2003), Ghani and Din (2006)].

Governments in developed and developing countries spend a considerable amount in consumption and investment activities. This spending varies from 10 to 55 percent of a country's GDP in all over the world (Annex-I).[1] In a similar vein, government in Pakistan is spending huge

[1]Index of Economic Freedom 2014 by the Heritage Foundation and the Wall Street Journal

resources to meet consistent increase in demand due to population growth and for provision of social services. In FY 2017, total outlay of government expenditures is Rs. 5796.3 billion which is 19.9 percent of GDP according to economic survey of Pakistan for 2016-17. However, despite this trend of substantial government spending in Pakistan, its impact on growth and other social indicators is unclear. Different studies come up with different results. Ghani and Din (2006) find no significant association between government investment and consumption expenditures and economic growth of Pakistan. In a similar study, testing the Wagner law on Pakistan, Rehman et al. (2007) find no evidence in support of long run relationship between government spending and GDP. Asghar et al. (2011) study government expenditures at disaggregate level and find that human capital and community services expenditures have positive while subsidies and law & order expenditures have negative long-run relation with GDP of Pakistan.

Secondly, a major portion of government spending is spent by the provincial governments in Pakistan. Particularly, after the 7th National Finance Commission award, resource distribution criteria has been tilted in favor of provinces and there share in revenues has increased considerably (Annex-II). After the 18th amendment in the constitution of Pakistan, seventeen federal ministries (mostly related to social sectors) have been delegated to provinces. So, provinces are now responsible for major government spending on social services and several other sectors of the economy, it calls for a comparative study to see if the government expenditures at provincial level have different effect on economic growth of Pakistan as weighed against federal level expenditures. In one relevant study Faridi (2011) analyze the impact of fiscal decentralization on economic growth of Pakistan and finds that fiscal decentralization has positive relationship with economic growth.

While most of research work in Pakistan has focused on seeing the impact of overall government spending or relationship between fiscal decentralization and economic growth, this study distinguishes itself by its focus on seeing the impact of government spending at federal as well as provincial level. The results of the study show that government spending has significant correlation and long-run relationship with economic growth of Pakistan. Moreover, it is found that spending at Provincial level is more beneficial to boost the economy as compared to federal level spending in Pakistan.

1.2 Motivation of the Study

After the 7th National Finance Commission Award share of resources towards provinces has increased many times and also after 18th constitutional amendment, 17 federal ministries have been devolved to provinces. So planning and utilizing these resources in an efficient manner is very important task for provinces to achieve higher and sustainable growth. So in this regard, to study the impact of these resources on our economy is an important issue for investigation.

1.3 Objective of the Study

The key aim of this study is to investigate the relationship of federal as well as provincial spending with economic growth (GDP) of Pakistan. More specifically, the objective of the study as follow:

1. To investigate short run and long run relationship of government spending with economic growth (GDP) of Pakistan.

2. To investigate and compare the impact of federal and provincial spending on economic growth (GDP) of Pakistan.

1.4 Significance of the Study

In the context of Pakistan's economy, mostly studies related to this subject have focused on federal spending. There is hardly found any study which focuses on provincial level spending and no study carry out comparative analysis of federal and provincial spending. This study adds the dynamics of provincial spending and its relationship with economic growth of Pakistan along with federal level expenditures. This analysis is helpful for assessing the impact of government spending on growth of our economy. Moreover, results of the study helps to decide that spending at provincial level is more beneficial for growth as compared to federal spending.

1.5 Organization of this study

After the introduction chapter, the remainder of study is organized in following way. Chapter 2 contains literature review of the subject study. Brief overview of the national and provincial economies is presented in chapter 3. Data, variables description and Methodology used are explained in Chapter 4. Results of the study are explained in Chapter 5. Conclusion and policy recommendations are mentioned in chapter 6.

CHAPTER II

Literature Review

Economic growth of regions and countries differ depending upon various social, environmental, cultural, historical practices and economic factors. One of these factors is seen to be the role and interference of government in the economy. Several studies (both theoretical and empirical) have been conducted at international and national level to look into the role of government in economic growth of a country or a region. These constitute both time series and panel studies. In this chapter, a brief overview of literature comprising role of government in economic growth is discussed.

2.1 Country level Studies

Studies have shown mixed results on relationship between public spending and economic growth. Barro (1990), by including government services financed by tax, extends the strand of endogenous-growth models that assume constant returns to capital. He shows that savings rate and growth rate rise initially with increase in productive government expenditures, but fall ultimately when there is rise in utility-type expenditures. He discusses the implications of his theory regarding relationship between government size and the two rates in light of results of other empirical studies on this relationship.

In an empirically study, Deverajan et al. (1996) examine how public expenditures and economic growth are related on data of developing countries and finds that impact on economic growth of increase in current expenditures is positive and significant. Conversely, an increase in other expenditures - capital, health, education and transport and communication - has either negative or insignificant effect on economic growth. In another similar study, Abu-Bader et al. (2003), estimate causal relationship between government spending and economic growth for Syria,

Israel and Egypt by employing variance decomposition and multivariate co-integration technique for the period 1967-1998. They find bi-directional causality along with long run negative relationship between government spending and economic growth. Furthermore, one of the findings is negative impact of military spending on economic growth for all countries whereas impact of civilian government spending on economic growth is positive for Egypt and Israel.

Aschauer (1988) employs annual time series data of United States spanning over 1949 to 1985 to find out how government spending variables (stock and flow) impact aggregate productivity and find that non-military spending, as in public capital stock, has more significant effect on productivity than military spending. Core infrastructure of roads, mass transit, streets, airports, and water system has considerable effect on productivity whilst military spending is found to have little impact on productivity. Landau (1983) uses a dataset of 104 developed and developing countries over 1961-1970 to investigate the nature of relationship that prevails between government consumption spending as share of GDP and rate of growth of real per capita GDP. Employing stepwise regression technique, study finds that government consumption expenditures have negative relationship with growth of per capita GDP. On other hand, total investment on education has positive relationship with per capita GDP. The study also finds that higher government expenditures and low investment in education slows down growth of low income countries. On similar lines, Aschauer (1989) also studies the role of public expenditures on productivity growth of seven industrial countries (G-7) over the years 1966-85. Assuming a neoclassical production technology, he distinguishes between public expenditures by splitting them into the public consumption and public investment. He argues that public investment is necessary for private production growth and it has positive relation with productivity growth. Government consumption expenditure has significant negative relationship with productivity

growth. The study finds that public capital is akey factor tolift up standards of living and economic growth.

Kweka and Morrissey (2000) also carry out empirical investigation into impact of government expenditure on economic growth using data of Tanznia over 1965 to 1996. They find that physical investment and growth has negative relationship while relationship between consumption expenditure and growth is positive and impact of human capital investment turns out to be insignificant. They argue that public investment in Tanzania is not productive and negate the argument that spending on consumption reduces growth.Afonso and Furceri (2010) employ pooled country and time fixed effects on data of EU and OECD countries to analyze how size of government spending and revenues and their volatility effect the growth. They find that both variables have detrimental impact on growth and total expenditures and revenue seemed to have negative impact on real per capita GDP both for EU and OECD countries.Hansson and Henrekson (1994) develop a new framework to test the effect of government spending on growth and productivity using the data of 14 OECD countries and 14 industries over the period 1970-87. They argue that it is more appropriate to use disaggregate data so that effect of different types of government expenditures on rate of growth of productivity can be focused in non-government sector andfind that rate of growth of total factor productivity is negatively affected by consumption and transfers spending whilst education spending and total factor productivity are positively related. Effect of government investment on private productivity growth is insignificant. Moreover, impact of government spending on private sector productivity is reflected through its effect on total factor productivity and not through channel of marginal productivity of labor and capital as no significant relationship is found between the level of different government spending categories and marginal productivity of labor and capital.

Sinha (1998) explore relationship between government expenditure and GDP of Malaysia using annual data over the period 1950-92. Logarithms of government expenditure and GDP are used in the study. Johansen co-integration test shows that variables are co-integrated and number of co-integrated vectors is one. Then augmented Granger causality test is applied by chosing various lags. Result of this test indicate causality does not that does not flow in any direction. This result indicates that incrase in GDP does not increase government expenditure. This may be due toreason that change in government expenditures may be affected more by some non-economic factors than economic factors. The result of Causality test also depicts that increase in government expenditures do not increase in GDP. So, present structure of government expenditures is not growth enhancing. Study argues that there exists cointegration between government expenditures and GDP which shows that long-run relationship exists between these two variables, however, there is no short run relationship between these two fiscal indicators.

Baffes and Shah (1998) employ a flexible production structure method wherein interaction between private and public inputs is allowed to see its impact on output. A distinction in public and private capital is made and public capital is further disaggregated into human resource development, infrastructure and military capital stock. Using pooled data of 21 countries for the period of 1965-84, analysis is carried out on the basis of region and income level instead of country. Per capita income is used as measure of output. Results indicate that human resource development has highest output elasticity followed by private capital labor output elasticity. In half the countries considered, infrastructure capital had low-output elasticity and military capital has negative output elasticity. The study concludes that developing countries can enhance their growth output by investing in education and training sectors and also by encouraging private investment and capital while limiting the military spending.

Musaba (2013) studies impact of government sectoral expenditure on economic growth in Malawi over the period of 1980-2007. Vector error correction model is used to check the cointegration among the variables and to calculate the effect of government expenditure in agriculture, health, education, social protection, defense and transport & communication on economic growth. The result of the study indicates that in short run both variables i.e economic growth and government expenditures has no relationship. Conversely, results indicate that agriculture and defense spending have significant positive impact on economic growth in long run. Government spending on health, education, social protection and transport and communication has negative association with economic growth. The study argues that an efficient management of government spending is needed to have its positive and productive impact on economic growth in Malawi.

In a similar study, using a time series approach, Magazzino (2012) empirically investigates the relationship between public spending and aggregate income in Italy at disaggregated level for the period 1960-2008. Johansen and Juselius cointegration test is applied to check the existence of long run relationship among variables. VECM technique is used to calculate the short run coefficients of the variables. Findings of the study confirm long run relationship between different categories of government spending and aggregate income. The study finds little support for Wagner's law in Italy and hence concluded that government spending and national income is more Keynesian than Wagnerian in Italy. Huang (2006) used annual time series data over the period 1979-2002 to test Wagner's law for China and Taiwan. Bounds test approach based on Unrestricted Error Correction Model (UECM) is used to check the long-run relationship among the variables. Toda and Yamamoto's (1995) Granger causality tests are applied to see causality between the variables. The results of the study indicate that size of government and economy has

no relationship in long run in China as well as in Taiwan. The results of the study do not support Wagner's Law, according to which as economy expands, usually government sector also grows. Moreover, the result of the study also does not support Keynesian view, according to which government expenditure is a key determinant of economic growth.

On similar issue, Liu et al. (2008) tested Granger causality between government expenditure and economic growth by using annual time series data of US federal government over the period of 1947-2002. Aggregate as well as disaggregate data with sub-categories of five federal expenditures namely national defense, physical resource expenditure, human resources expenditure, net interest payment and other expenditure are used in the analysis. Results of the study indicate that asgovernment expenditure increases,GDP also grows, which is in line with Keynesian view while no support is found for Wagner's Law. Human resource investment and net interest payments have positive impact on US economy whilst defense spending has no impact on GDP growth of US.

2.2 Regional level Studies

Many studies have been conducted at regional/state level **to** see the impact of government spending at regional/state level within a country. In one of such study, Akai and Sakata (2002) use cross sectional state level data of USA from 1988-1992 and studies dynamics of fiscal decentralization in relation with economic growth. Four different types of indicators i.e production, revenue, autonomy and production-revenue of fiscal decentralization are used to see its impact on GDP. These indicators include revenue indicator, production indicator, autonomy indicator and production-revenue indicator. The empirical analysis shows that fiscal decentralization positively affects economic growth significantly. The study also finds that income inequality reduces economic growth. Xie et al. (1999) also studies relationship of fiscal decentralization on the long-

run economic growth of the economy of United States using annual data over the years of 1984 to 1994. By using a simple model of endogenous growth with public spending by different tiers of government, the study explain how fiscal decentralization effect long-run growth of economy. The study finds that current level of spending by local and state governments is optimum for growth and further fiscal decentralization may be harmful for growth of the economy.

In a similar study, Fan et al. (2004) estimate impact of different types of government expenditures on agriculture growth and rural poverty in Uganda. Using district-level data for 1992, 1995 and 1999, impact of expenditure on agriculture research, rural roads, education and health on agricultural growth and rural poverty is estimated. By developing a simultaneous equations model, double-log function for the equations is used. Full information maximum likelihood technique is used to estimate the system. Results of the study indicate that government spending on rural infrastructure; agricultural services, rural health and education positively contribute to agricultural productivity growth and reduce rural poverty. Production function based regression analysis is used byLin and Liu (2000) to examine the impact of fiscal decentralization on economic growth of China on data of provincesfor the period from 1970 to 1993. Marginal Retention rate of revenue is used as an indicator to measure degree of fiscal decentralization.Rate at which increasedrevenues are retained by provinces is considered as marginal retention rate of revenue. Major reforms of fiscal decentralization by China are used as separate proxies in the empirical investigation. Results of the studydepict that fiscal decentralization positively affect to economic growth in China. The study concludes that capital accumulation, fiscal and rural reforms are the major factors behind China's remarkable growth for last two decades.

Fan et al. (2000) develop a simultaneous equation model and uses data of Indian States for the period 1970-93 to study the effect of different categories of government expenditures on

productivity growth and rural poverty. Method of full information maximum likelihood (FIML) is employed for estimation of the equations. The study finds that spending on investments which enhance productivity such as agriculture, rural infrastructure and development, irrigation and R&D reduces rural poverty and also has positive relationship with growth of agricultural productivity. The study also finds that other investments like soil and water conservation and health have very little impact on growth and poverty.Using panel data of 46 developed and developing countries over the years 1970-1989, Davoodi and Zou (1998) study the relationship between fiscal decentralization and economic growth. Fiscal decentralization is measured as sub national government share of total government expenditure. Study reveals that there is no significant relationship between fiscal decentralization and growth in developed countries but both variables have negative relationship in case of developing countries. They argue that negative impact of fiscal decentralization on economic growth may be due to excessive spending by sub-national governments on inappropriate expenditure items**.**

2.3 Studies related to Pakistan

In context of Pakistan's economy, Ghani and Din (2006) empirically examine the relationship between public investment and economic growth using Vector Auto Regressive - (VAR) approach over the period 1973 to 2004. The variables used are private investment, public consumption, private investment and GDP. Results of the study indicate that public investment and public consumption strongly affects economic growth of Pakistan and concludes that growth is mainly driven by private investment in Pakistan.On similar lines, Rehman et al. (2007) investigate the existence of Wagner's Law in Pakistan over the period of 1972-2004. To examine the long-run relationship between government expenditures and its determinants, Johansen and Juselius (1990) cointegration method is employed. Error Correction Model (ECM) is used to study

the short term dynamics of the variables. The variables used in the study include public expenditures, exports and imports, GDP, prices, population and M2. Real per capita GDP is used to measure the level of economic development. Study finds that there is a long-run relationship between under study variables and per capita income, financial development and openness of the economy are the key determinants of government expenditures in Pakistan.

Asghar et al. (2011) investigate the impact of social sector spending on economic growth of Pakistan for the period 1974-2008 using annual data. Per capita income is used as dependent variable. Government spending on Human Capital, law & order, subsidies and economic & community services are taken as independent variables. Test of Johansen and Juselius is employed to study relationship among the variables in long run. Results of study show that human capital and economic & community services have long-run positive relationship with economic growth. On the other hand, law & order and subsidies have negative and significant long-run relationship. This may be due the fact that both law & order and subsidies are inflationary and unproductive and hencedeteriorate the growth process. Vector error correction model (VECM) is used to study short run as well as long run relationship among the variables. Results confirm long-term relationship between the variables as the coefficient of error correction term is negative and statistically significant. In a similar study, Faridi (2011) studies impact of fiscal decentralization on growth rate of economy of Pakistan by usingannual data for the period 1972-2009. Neo-classical growth model is extended and OLS technique has been employedfor estimation of autoregressive model. GDP at current factor cost is used at dependent variable and variables of provincial revenue and expenditure are used as the measure for fiscal decentralization. Literacy rate is used as control variable to calculate the impact of human capital on economic growth. Other control variables include trade openness and inflation. Results of the study show that fiscal

decentralization positively affects to growth of economy of Pakistan as signs of coefficients of both variables are positive and significant statistically. The study concludes that fiscal decentralization enhances efficiency of public sector resultantly having positive impact on growth and development of the country.

2.4 Conclusion

We can see from literature survey that extensive studies are carried out to study the impact of government spending on the economic growth (GDP) of the respective countries. Different studies have come up with different results regarding the impact of government spending on GDP Growth of respective country. In Pakistan most of the studies have focused on analyzing the impact of overall government spending on the economic growth of Pakistan. There is hardly found any study which simultaneously studies the impact of federal as well as provincial spending on the economic growth of Pakistan. As after the approval of 7th NFC award, huge resources are being shifted from federal to provincial governments, this calls for studying the impact of provincial governments spending on economic growth of Pakistan. This study fills this gap by conducting an empirical study to investigate and compare the impact of spending by federal as well as provincial governments on economic growth (GDP) of Pakistan.

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CHAPTER III

Overview of National and Provincial Fiscal Performance

3.1 History of Fiscal Indicators

In terms of Purchasing Power Parity, Pakistan has 25th largest economy in the world and 42nd largest in terms of nominal gross domestic product. The current per capita income of Pakistan is $1629 in FY 2017.[2] Sustainable public finance is key to have sustainable development and fiscal discipline. It reduces vulnerabilities and supports fiscal policy to achieve macroeconomic stability. Over the last decade, fiscal sustainability of Pakistan experienced challenges from tax evasion, massive subsidies, Public Sector Enterprises (PSEs) losses, low tax to GDP ratio and persistent fiscal deficit. However, in recent years we can see a fiscal discipline resulting in improved tax to GDP ratio and efficient allocation of government expenditures towards social sectors.

Table 3.1 show Pakistan's economy performance on fiscal front. Over the last four years, Pakistan's GDP growth is on upward trajectory. Overall fiscal deficit has come down to 4.6 percent of GDP in FY2016 from 8.8 percent of GDP in FY2012. This containment of fiscal deficit is result of increased tax revenue, decline in total expenditures and higher provincial surplus. Primary deficit has also reduced to 0.3 percent of gross domestic product from 3.8 percent of GDP in FY13 due to fiscal consolidation efforts.

[2] Economic Survey of Pakistan 2016-17

Table 3.1: Fiscal Indicators as percentage of Gross Domestic Product

Year	GDP Growth (Real)	Fiscal Deficit	Expenditures			Revenue		
			Total	Current	Developm-ent[3]	Revenue (Total)	Tax	Non-Tax
FY08	4.99	7.30	21.40	17.40	4.00	14.10	9.90	4.20
FY09	0.36	5.20	19.20	15.50	3.50	14.00	9.10	4.90
FY10	2.58	6.20	20.20	16.00	4.40	14.00	9.90	4.10
FY11	3.62	6.50	18.90	15.90	2.80	12.30	9.30	3.00
FY12	3.84	8.80	21.60	17.30	3.90	12.80	10.20	2.60
FY13	3.68	8.20	21.50	16.40	5.10	13.30	9.80	3.50
FY14	4.05	5.50	20.00	15.90	4.90	14.50	10.20	4.30
FY15	4.06	5.30	19.60	16.10	4.20	14.30	11.00	3.30
FY16	4.51	4.60	19.90	16.10	4.50	15.30	12.60	2.70
FY17 B.E	5.70	3.80	19.80	15.00	4.70	16.00	12.90	3.10

Note: Estimated growth during FY17 is 5.28 %.
Source: Economic survey of Pakistan 2016-17

In developing countries, public expenditures have very critical role to boost economic growth and to reduce poverty and income inequality. There has been a lot of debate over the efficiency and effective utilization of public expenditures in Pakistan. A huge amount of public expenditures are exhausted by interest expenses, unprofitable PSEs, untargeted subsidies, energy subsidies and security expenses. So, government is unable to spend resources in vital areas of the economy. Conversely, due to low revenues, public spending has constraint of finance. This situation results in rise of fiscal deficit. However, in recent years, there is an improvement in fiscal balance through expenditure management and resource mobilization strategy. Total expenditures

[3] Including net lending

in FY16 are Rs. 5796.30 billion as compared to Rs. 5387.80 billion in FY15, indicating the increase of 7.60 percent. Figure 1.1 shows historical path of government expenditure in Pakistan.

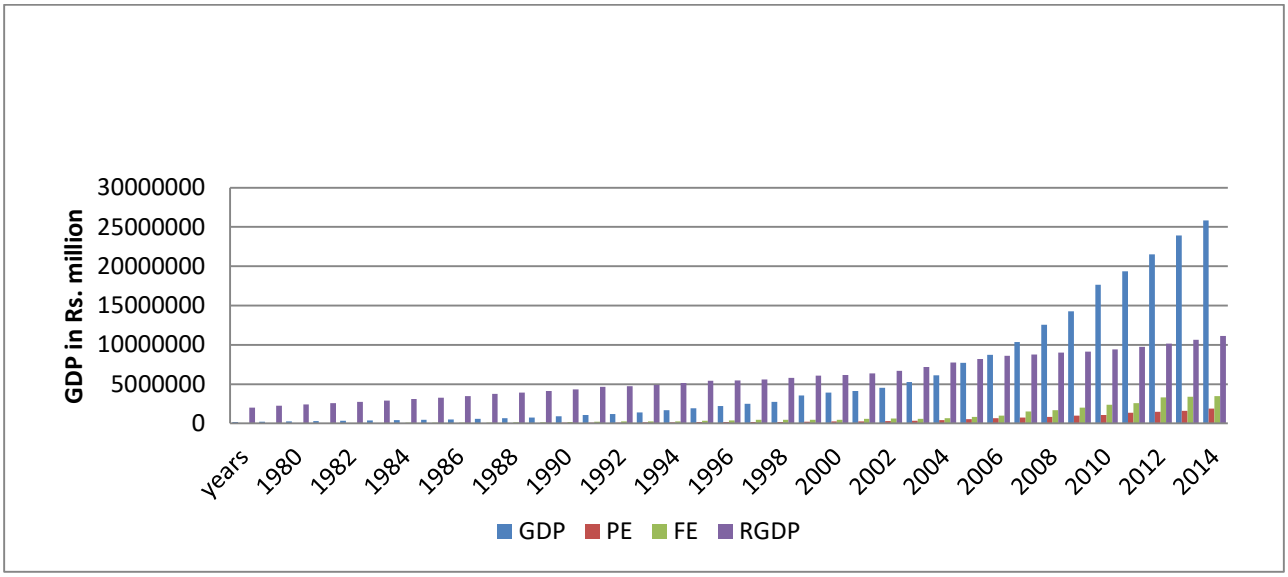

Figure 3.1: Annual Federal and Provincial Government Expenditures: 1979-2015

Source: State Bank of Pakistan

The government expenditures consist of two types, current and development. Total expenditures are 19.90 percent of gross domestic product in FY16. Current expenditures are 16.10 percent of gross domestic product and development expenditures apart from net lending are 4.50 percent of gross domestic product. Total expenditures have shown a downward trajectory from 21.50 percent of gross domestic product in FY13 to 19.90 in FY16. However government has not reduced development expenditures to boost the economic growth. Specifically, government has raised public sector development program (PSDP) sufficiently for meeting the development needs of the country. For the FY18, Rs. 1,001 billion has been allocated for federal PSDP. The same was Rs. 348 billion in FY13 indicating an expansion of nearly 300 percent. The growth in current expenditures has declining trend as it increased at 6.1 percent as compared to the increase of 10.5 percent in FY15. In absolute terms, it is equal to Rs. 4694.30 billion in FY16 as compared to Rs. 4424.70 billion in FY15. Decline in growth of current expenditures is achieved by cutting

expenditures on subsidies and markup payments. In FY16, current expenditures have share of 81.0 percent in total expenditures. Trends in different components of expenditure are presented in following table.

Table 3.2: Trends in Components of Expenditure (As % of Gross Domestic Product)

Year	Total Expenditure (1)	Current Expenditure	Markup Payments (2)	Defence (3)	Development Expenditure*	Non Interest Non-Defence Exp (1-2-3)	Fiscal Deficit
FY06	17.10	12.60	2.90	2.90	4.40	11.20	4.00
FY07	18.10	14.90	4.00	2.70	4.70	11.40	4.10
FY08	21.40	17.40	4.60	2.60	4.20	14.20	7.30
FY09	19.20	15.50	4.80	2.50	3.40	11.80	5.20
FY10	20.20	16.00	4.30	2.50	4.10	13.40	6.20
FY11	18.90	15.90	3.80	2.50	2.80	12.60	6.50
FY12	21.60	17.30	4.40	2.50	3.90	14.60	8.80
FY13	21.50	16.40	4.40	2.40	3.50	14.70	8.20
FY14	20.00	15.90	4.60	2.50	4.50	12.90	5.50
FY15	19.60	16.10	4.80	2.50	4.10	12.30	5.30
FY16	19.90	16.10	4.30	2.60	4.50	13.00	4.60
FY17 B.E.	19.80	15.00	4.10	2.60	4.70	13.10	3.80
*excluding net lending							

Source: Budget Wing, Finance Division and EA Wing's Calculations

Due to growth in development spending, total expenditures have increased in FY2016. Development expenditures including net lending expanded from Rs. 1140 Billion in FY15 to Rs.1314.10 billion in FY16, showing a growth of 15.2 percent. PSDP spending showed an increase of nearly 20 percent during FY16 and are equal to Rs.1185.80 billion as compared to Rs. 987.80 billion in FY15. PSDP of fedral government increased to Rs. 602.10 billion during FY16 as

compared to Rs. 502.20 billion in FY15, depicting a increse of 19.90 percent as compared to last fiscal year.

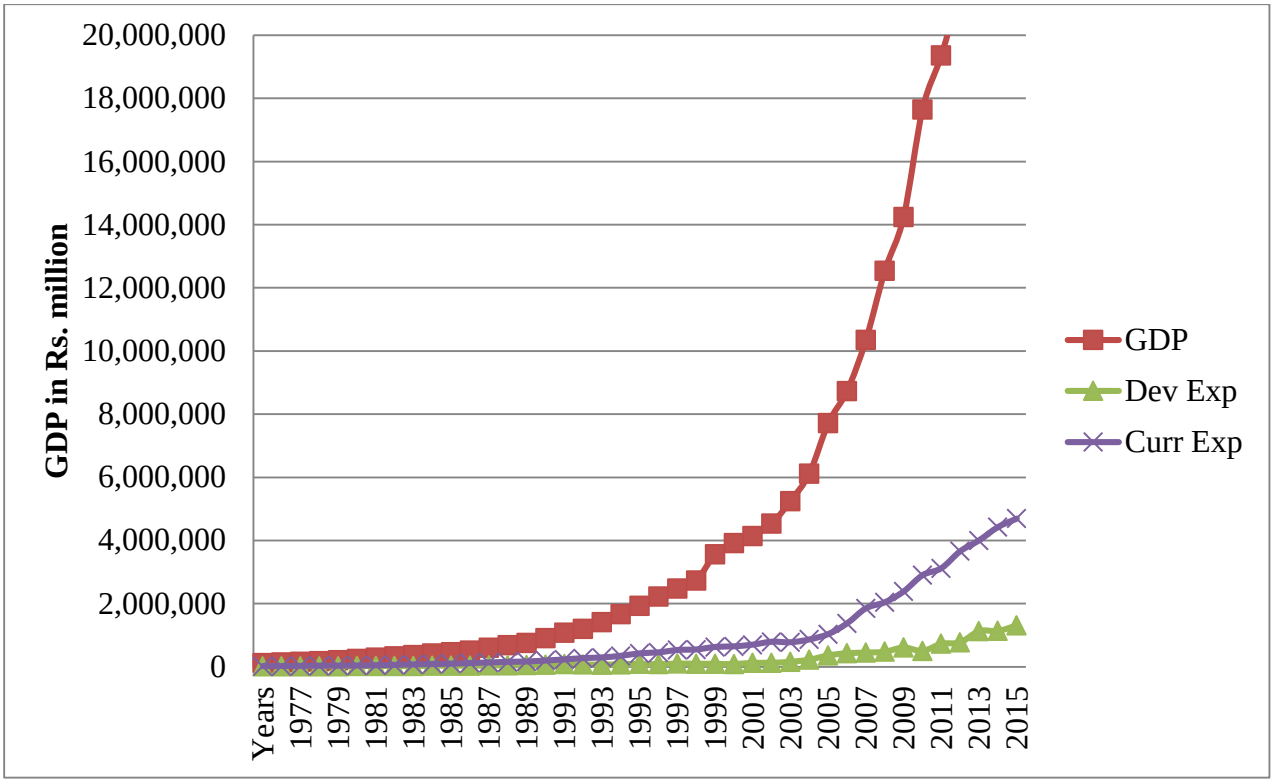

Figure 3.2 : Annual Govt. Dev. and Curr. Expenditures: 1976-2015

There has been a lot of debate over shifting resources and fiscal powers from federal government to provincial governments. After the approval of 18th amendment in the constitution and 7th National Finance Commission Award, to simulate growth at provincial level it has become vital to formulate provincial growth strategies. The growth strategies should form the basis for the allocation of funds among different sectors in annual development programs (ADPs). Through 18th amendment in constitution of Pakistan many powers are transferred to provinces. Now it's provincial matter to set policies that ensure level playing field to promote growth and upgrade the living standards of citizens of provinces and nation as a whole.

Table 3.3: Growth rate of Pakistan and Provincial Economies in different Eras

	Bhutto Era 1973-77	Zia Era 1977-88	PPP+PML(N) 1988-99	Average 1973-99
Pakistan	2.52	6.38	4.51	4.89
Punjab	3.16	5.97	4.50	5.09
Sindh	1.95	7.06	3.92	4.94
KPK	1.18	7.03	4.33	4.99
Balochistan	2.68	5.02	4.63	4.49

Note: Data is obtained from Bengali and Sadaqat (2001), growth rates are calculated by the author of this study. All above values are in percentage form.

Table 3.3 is showing remarkable differences in growth rate of provincial economies. If we look in the long run we come to know that all four provincial economies are growing at rate of 5 percent on average from 1973-1999. Further looking in different regimes, we see that in 80's when country was growing at the rate of more than 6 percent, at that time Sindh and Khyber Pakhtunkhwa showed tremendous growth of more than 7 percent.

Table 3.4: Growth Rate of Pakistan and Provincial Economies in and after 1999

	2000-08	2008-2013	2013-2015	Average 1999-2015
Punjab	5.35	3.42	3.85	4.51
Sindh	5.55	2.37	4.62	4.36
KPK	4.92	3.20	2.36	4.01
Balochistan	5.25	2.29	2.44	3.89
Pakistan	5.32	3.00	3.78	4.34

Source: Pakistan Punjab Social Sector Public Expenditure Review 2013

Pakistan economy attained faster growth rate during the period 2000-08. Sindh achieved the highest growth rate of 5.5 percent among all provinces. Punjab and Balochistan also achieved the growth rate of more than 5 percent. While growth rate for Khyber Pakhtunkhwa remained

below 5 percent. During the period of 2008-13, country faced the slow growth pattern of average 3 percent. Punjab and Sindh could show only 3.42 and 2.37 percent growth rate. While the Khyber Pakhtunkhwa and Balochistan economies achieved the growth rate of 3.20 and 2.29 respectively. On average Pakistan's growth rate from 1999-00 to 2014-15 remained 4.34%. On provincial level in Punjab and Sindh, average growth rate was 4.51 and 4.36 percent. While Khyber Pakhtunkhwa and Baluchistan's average growth rates were 4.01 and 3.89 respectively during the period of 1999-00 to 2014-15.

3.2 Size of Provincial Economies

Size of respective provincial economies is given in following table3.5. Punjab being the largest Provincial economy has nearly 52 percent share in national economy. Sindh economy's share is nearly 28 percent. Share of Khyber Pakhtunkhwa and Balochistan has fallen from 1999-00 to 2014-15. War on terror is one of the reasons of decline in share of these provincial economies. Balochistan is the smallest province with respect to its share in the national economy.

Table 3.5: Size of Provincial Economies and National Economy

	1999-00 (Rs. milions)	**Percentage Share**	**2010-12 P (Rs. millions)**	**Percentage Share**
Punjab	1837299	51.58	3180839	52.77
Sindh	1009674	28.34	1684550	27.94
KPK	403181	11.34	663059	10.99
Balochistan	311864	8.75	500123	8.30
Pakistan	3562018	100	6028571	100

Source: Pakistan Punjab Social Sector Public Expenditure Review 2013. Data is in constant factor cost.

The 7th National Finance Commission (NFC) was formed in 2005 and presented its award in 2010. From July 2010, this award became effective. According to this award major adjustments in vertical (from centre to provinces) as well as horizontal (among provinces) distributions are made. Resource distribution criteria have changed in favor of provinces. The share of provinces in the divisible pool of taxes has increased from 47.5% to 56% in the first year FY11 and 57.5% afterwards. Divisible pool of taxes includes income tax, capital value tax, wealth tax, taxes on sale and purchase, export duties on cotton, custom duties, federal excise duties (FEDs) excluding FED on gas and any other tax which may be levied by the Federal Government. Right of provinces has been accepted on collection of sales tax on services.

7th NFC award uses various indicators for horizontal distribution of resources. Before it, population was the only major factor for resource distribution. Resource sharing on the basis of multiple criteria is a big achievement of the 7th NFC award. This multiple criteria take account of population (82%), poverty or backwardness (10.3%), revenue collection and generation (5.0%), and area or inverse population density (2.7%). Funds of divisible pool are shared between the federal government and provincial governments according to following criteria:

Table 3.6: Resource distribution Criteria between Federal and Provincial Governments

	Provincial Governments	**Federal Government**
FY2011	56% of divisible pool	44% of divisible pool
FY2012 & Onwards	57.5% of divisible pool	42.5% of divisible pool

According the multiple criteria mentioned above, horizontal distribution of resources among provinces is as follow:

Table 3.7: Resource distribution Criteria among Provinces

	Provinces Share (7th NFC Award)	**Provinces share (Prior to 7th NFC Award)**
Punjab	51.74 % of total provincial share from net proceeds of divisible pool	57.36%
Khyber Pakhtunkhwa	14.62% of total provincial share from net proceeds of divisible pool	13.82%
Sindh	24.55% of total provincial share from net proceeds of divisible pool	23.71%
Balochistan	9.09% of total provincial share from net proceeds of divisible pool	5.11%

A comparison of pre-post 7th NFC award resources distribution is presented in below table. This table clearly shows tilt of resources towards provinces after 7th NFC award. Resources towards provinces have been doubled from Rs.1052.0 billion in FY10 to Rs.1608 billion in 2014-15.

Table 3.8: Transfers to Provinces (Pre-Post 7th NFC award Comparison) (Rs. in Billion)

	Year	**Divisible Pool**	**Straight Transfer**	**Grants**	**Total**	**Divisible Pool as % of total FBR tax Collection**
Pre 7th NFC Period	2004-05	205	41	35	281	35
	2005-06	245	57	64	366	34
	2006-07	321	70	29	420	38
	2007-08	391	66	33	490	39
	2008-09	477	82	41	600	41
	2009-10	574	81	82	737	43
Post 7th NFC Period	2010-11	835	163	54	1052	54
	2011-12	1063	146	54	1263	57
	2012-13	1118	104	61	1283	58

	2013-14	1287	124	54	1465	57
	2014-15	1477	97	34	1608	57

3.3 Conclusion

We can see that public finance is a key instrument in Pakistan's fiscal policy to boost the economic growth of the country. It has also an important contribution to reduce the poverty and income inequality in the country. To achieve these objectives, current government has substantially increased the PSDP to channelize the resources towards the development of the country. After the 7th NFC award, big share of resources has shifted towards provinces. Moreover, after the18th constitutional amendment in the constitution of Pakistan, 17 federal ministries have been devolved to the provinces. These seventeen ministries include all ministries related to social sector like education, health etc. Now, its provinces' responsibility to use this bulk of resources to uplift these social sectors and contribute to sustainable development of the country. So, provinces now have to play a major role in overall growth of the economy.

CHAPTER IV

Methodology and Data

This chapter covers theoretical background of model, data and variables description. Estimation procedure is also elaborated here. First we elaborate the theoretical framework followed in our study in section 4.1. Then variable description and data sources used are explained. In the end, estimation strategy used will be elaborated.

4.1 Theoretical Framework

Ram (1986) developed two-sector production function framework which is followed here. Let the economy have two sectors, the government sector (G) and the nongovernment sector (C). labor (L) and capital (K) are used as inputs for Output in each sector. Output of other sectors is affected by the externality effect of output of government sector. Hence production functions of these two sectors are represented as

(1) $C = C(L_c, K_c, G)$,

(2) $G = G(L_g, K_{g)},$

here subscripts represent inputs of concened sector; Let the total inputs are set as,

(3a) $L_c + L_g = L$,

(3b) $K_c + K_g = K$,

So, the sum of outputs in two sectors is total output (Y), hence

(3c) $C + G = Y$,

Let there is difference in relative factor productivity in the two sectors,

(4) $G_L/C_L = G_K/C_K = (1+\delta)$,

Here uppercase subscripts represent partial derivatives of the functions with respect to subscripted input; for example, G_L represents $\partial G/\partial L$ or its discrete analog $\Delta G/\Delta L$. We can see that the sign of **δ** tells which sector has more marginal factor productivity and if sign of **δ** is positive this indicates higher input productivity in the government sector. By using the production functions as well as equations (3) and (4), below mentioned aggregate growth equation can be derived approximately:

$$\dot{Y} = \alpha(I/Y) + \beta\dot{L} + [(\delta/(1+\delta)) - \theta]\,\dot{G}(G/Y) + \theta\dot{G}, \tag{5}$$

or, substituting **δ**' for **δ** /(1 + **δ**),

$$\dot{Y} = \alpha(I/Y) + \beta\dot{L} + (\delta' - \theta)\dot{G}(G/Y) + \theta\dot{G}\ , \tag{5'}$$

Here a dot on the variable describes its growth rate; hence, 'Ẏ' denotes dY/Y or its discrete equivalent **Δ**Y/Y. The parameters β, α, and θ are parameters to be estimated in growth models. Here, 'β' represents elasticity of nongovernment output 'C' with respect to 'L'; 'α' represents the marginal product of 'K' in the 'C' sector; and 'θ' equals $C_G(G/C)$, and is the elasticity of nongovernment output with respect to 'G'. The variable 'I' is investment and is assumed to equal dK (or **Δ**K). If 'θ' is assumed to be a constant parameter across the sample observations, equation (5) fives an econometric specification that can provide estimates of **δ** and θ. This depicts the intersectoral factor productivity difference and marginal externality effect of economy respectively. C_G and θ show externality affect. C_G is "marginal product" and gives increase in non-government output when the government size 'G' increases by one unit for constant 'Lc' and 'K_c'.

The parameter 'θ' represents elasticity and measures percentage increase in 'C' when 'G' increases by 1 percent for given 'Lc' and 'K_c'.

If **δ**' is equal to θ (**δ**'= θ), then a special case emerges and (5) becomes

(6) $$\dot{Y} = \alpha(I/Y) + \beta\dot{L} + \theta\dot{G}\ ,$$

Here θ shows the externality effect of government size only. θ also gives an estimate of **δ'** (and of δ), and hence of the total effect, if the constraint **δ'**= θ is uphold.

If we consider that C_G, rather than θ is the constant parameter, then we can write (5) as

(7) $$\dot{Y} = \alpha(I/Y) + \beta\dot{L} + (\delta' + C_G)\dot{G}(G/Y)$$

Here, advantage of (7) is that one can directly obtain impact of overall size of government from the coefficient $\dot{G}(G/Y)$.

Some studies by Rubinson and Landau (1983) use a regressor like G/Y which is used widely for estimating the impact of government on growth of economy. So according to these estimates the growth model becomes;

(8) $$\dot{Y} = \alpha_K(I/Y) + \beta_L\dot{L} + \gamma(G/Y)$$

Here, "$\dot{Y}$" is growth rate of output (GDP),"I/Y" represents share of investment as percentage of output (GDP), "$\dot{L}$" represent growth rate of labor and "G/Y" represent share of government expenditures as share of output (GDP).

4.2 Empirical Specification of the Model

By following Ram's (1986) framework, the empirical specification of our model takes the following form:

$$Y_t = \beta_0 + \beta_1(I_t) + \beta_2 Open_t + \beta_3 lab_t + \sum_{i\in\omega}\beta_i \Delta\, Exp_t^i + \varepsilon_t \qquad (4.1)$$

Here Y_t is log of GDP at constant factor cost, I_p is log of private investment, $Open_t$ is log of sum of exports and imports, lab_t is log of total labor force and term Exp_t^i represents log of

provincial and federal government expenditures. Moreover, βs represent elasticities of respective variables and $\varepsilon_t$is error term. To capture the effects of trade policy, we have used openness as control variable.

4.3 Data Sources

Data for the variables concerned GDP, Federal and Provincial Government expenditures, exports plus imports, and labor force is taken from State Bank of Pakistan and World Bank. We have used data for the period of 1979-2015 and the data is taken on annual basis. Real variables are used by adjusting Nominal variables with GDP deflator. All variables are used in logarithm form as used in the growth model to measure elasticities.

4.4 Variables Descriptions

4.4.1 GDP

Gross domestic product (GDP) tells the growth of an economy over a year. There are number of variables which affect the economic growth of a country. Following the theoretical model of Ram (1986), impact on economic growth (GDP) is measured using several key variables. Data of real GDP at constant factor (base 2005-06)is taken from world development indicators (WDI) and it is used as dependent variable to measure the growth of economy of Pakistan.

4.4.2 Government Expenditures

Our key variable is government expenditures. We have segregated total government expenditures into federal vs provincial expenditures and hence this variable is used as an independent variable to see its impact on GDP growth of Pakistan. Variable is converted in real form by dividing it GDP deflator. In Specification 1, total federal government expenditures and

total provincial expenditures are used to see its impact on GDP growth of Pakistan. In Specification 2, interest payments are excluded from both expenditures. Defence spending is excluded from Federal government spending in Model 2 to compare the real impact of provincial and federal government spending on GDP growth of Pakistan.

4.4.3 Labor Force

As depicted by the theoretical model, labor force is used as independent variable. As the data of labor force is not available for some years, hence we used population as a proxy for labor force as used by Alshahrani and Alsadiq (2014).

4.4.4 Openness

Openness is taken by adding exports and imports. This is taken as control variable to capture the impact of trade on gross domestic product. Openness is calculated as sum of exports and imports.

4.4.5 Private Investment

Another variable which effects economic growth is private investment. So, following our theoretical model, private investment is used to see its impact on economic growthas used by Alshahrani and Alsadiq (2014).

4.5 Estimation strategy

We have measured short run and long run impact of government expenditure (federal and provincial) on GDP growth of Pakistan. Cointegration technique, Auto Regressive Distributed Lag (ARDL) developed by Pesaran et al. (2001) is employed for estimation. In ARDL, Short run and long run components are determined concurrently by using only single equation.

Estimates of ARDL are efficient and unbiased. Probable diseases like endogeneity and serial correlation may be avoided by doing this (Pesaran et al. 2001). While, techniques developed by Engel & Granger (1987) and Johansen (1990) may not be suitable for small samples, according to Narayan and Narayan (2007), ARDL is most reliable for small samples. Same is also confirmed by Pesaran and Shin (1999), wherein it is shown that Johansen cointegration approach is best suitable when samples are large while for smaller ones, ARDL is most appropriate.

Biggest advantage of using ARDL lies in that all series do not necessarily need to be integrated of same order. Due to non-existence of this feature in standard cointegration techniques makes them unreliable due to two reasons. First, mostly series are not always integrated of same order. Secondly, order of integration of variables may not be reliable identified by standard unit root tests. However, ARDL approach to cointegration requires that the regressand is I(1) and explanatory variables are not integrated of order higher than one.

ARDL constitutes two steps: First significance of the lagged levels of the variables in the unrestricted error correction model is determined by employing F-statisis, which is used to test long-run relationship between variables and then coefficients of the long-run relationship are estimated. Given that, ARDL approach is employed in this study for estimation.

4.5.1 ARDL Model Specification

Two variables G_t and Y_t, are used to derive general form of error correction where Y is dependent variable (GDP growth here) and G (government expenditure here). Now, consider a relationship with lags m for G_t and n for Y_t. Considering the following two variables Y_t and G_t and both have n-lags:

$$Y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i Y_{t-i} + \Sigma_{i=0}^{m} \beta_j G_{t-i} + u_t \qquad (4.2)$$

Here short run impact of G_t on Y_t, is represented by β_j

By having following condition, long run coefficients can be estimated

$$Y_t = Y_{t-1} = Y_{t-2} = \cdots = Y_{t-n} = Y_t^* \quad \text{(a)}$$

$$G = G_{t-1} = G_{t-2} = \cdots = G_{t-n} = G_t^* \quad \text{(b)}$$

Substituting (a) and (b) into equation (4.2), then we get

$$Y_t^* = \alpha_0 + \alpha_1 Y_t^* + \alpha_2 Y_t^* + \cdots + \alpha_n Y_t^* + \beta_0 G_t^* + \beta_1 G_t^* + \beta_2 G_t^* + \cdots + \beta_n G_t^* + u_t$$

By rearranging the equation, it becomes

$$Y_t^* = \text{A} + \text{B}.G_t^* + u_t \quad (4.3)$$

here

$$A = \frac{\alpha_0}{(1 - \alpha_1 - \alpha_2 - \cdots - \alpha_n)}$$

,

$$B = \frac{(\beta_0 + \beta_1 + \beta_2 + \cdots + \beta_n)}{(1 - \alpha_1 - \alpha_2 - \cdots - \alpha_n)}$$

Here composite parameter B is known as the multiplier (long-run).

Error Correction Model is usually derived directly from equation (4.2) which is as under.

By substituting in equation (4.2) the following expressions;

$$Y_{t-n} = Y_{t-(n-1)} - \Delta Y_{t-(n-1)} \quad \text{(4.4 a)}$$

$$G_{t-n} = G_{t-(n-1)} - \Delta G_{t-(n-1)} \quad \text{(4.4 b)}$$

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \cdots + \alpha_{n-1} Y_{t-(n-2)} + (\alpha_{n-1} + \alpha_n) Y_{t-(n-1)} - \alpha_n \Delta Y_{t-(n-1)} - \alpha_n \Delta Y_{t-(n-1)} + \beta_0 + \beta_1 Y_{t-1} + \cdots + \beta_{m-1} Y_{t-(m-2)} + (\beta_{m-1} + \beta_m) Y_{t-(m-1)} - \beta_m \Delta Y_{t-(m-1)}$$

Now, substitute;

$$Y_{t-(n-1)} = Y_{t-(n-2)} - \Delta Y_{t-(n-2)} \quad (4.5\ a)$$

$$G_{t-(m-1)} = G_{t-(m-2)} - \Delta G_{t-(m-2)} \quad (4.5\ b)$$

Thus this results in as follows

$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \cdots + \alpha_{n-3} Y_{t-(n-3)} + ((\alpha_{n-2} + \alpha_{n-1} + \alpha_n) Y_{t-(n-2)} - (\alpha_{n-1} + \alpha_n)\Delta Y_{t-(n-2)} - \alpha_n \Delta Y_{t-(n-1)} + \beta_0 G_t + \beta_1 G_{t-1} + \cdots + \beta_{m-3} G_{t-(m-3)} + ((\beta_{m-2} + \beta_{m-1} + \beta_n) G_{t-(m-2)} - (\beta_{m-1} + \alpha_m)\Delta G_{t-(m-2)} - \alpha_n \Delta G_{t-(n-1)}$

Following results are obtained after successive substitution o\of equations (4.4 a, b), (4.5 a, b), and so on;

$$\Delta Y_t = \alpha_0 + \sum_{j=1}^{n-1} \alpha_j Y_{t-j} + \sum_{j=1}^{m-1} b_j Y_{t-j} + \gamma Y_{t-1} + \theta G_{t-1} + \varepsilon_t \quad (4.6)$$

The composite parameters in equation (4.6) are defined as;

$$\alpha_j = -\sum_{i=j+1}^{n} \alpha_j$$

$$b_j = -\sum_{i=j+1}^{m} \beta_i$$

$$\gamma = -\sum_{i=1}^{n} \alpha_i - 1$$

$$\theta = -\sum_{i=0}^{m} \beta_i$$

Hence, Unrestricted Error Correction Model (ECM) regarding growth-government spending relationship along with other variables are respectively given below by following equation (4.6):

$$\Delta GDP_t = \alpha_1 + \sum_{i=1}^{p} \theta_{1i} \Delta GDP_{t-i} + \sum_{i=1}^{q} \theta_{2i} \Delta PI_{t-i} + \sum_{i=1}^{q} \theta_{3i} \Delta OPN_{t-i} + \sum_{i=1}^{q} \theta_{4i} \Delta FE_{t-i} + \sum_{i=1}^{q} \theta_{5i} \Delta PE_{t-i} + \sum_{i=1}^{q} \theta_{6i} \Delta LB_{t-i} + \gamma_1 GDP_{t-1} + \gamma_2 PI_{t-1} + \gamma_3 OPN_{t-1} + \gamma_4 FE_{t-1} + \gamma_5 PE_{t-1} + \gamma_6 LB_{t-1} + \varepsilon_t \quad (4.7)$$

Here, ε_t is white noise error and Δ is changes from t-1 to t or first difference operator.

4.5.2 Bound Testing

To see whether long run relationship exists; using F-statistic, null hypothesis is tested as compared to alternative hypothesis. The null hypothesis state that coefficients of lagged variables have value equal to zero all together which depicts that variables fail to have long run relationship. On the other hand alterative hypothesis state that at least one of coefficient of these variables is non zero.

$H_o: \gamma_K = 0$ for all k

$H_a: \gamma_K \neq 0$ at-least for one k

The F-statistics have a non-standard distribution. This test depends on number of factors like number of regressors and whether under study variables in the ARDL model are integrated of I(1) or I(0) or a combination of both. Pesran et al, (2001) gave critical values which are used to compare the calculated value of F-statistic. Null hypothesis of this test says that no long run relationship exists among variables. And if we get value of F-statistic greater than the upper bound critical value after calculation, then the null hypothesis is rejected and hence we can accept the

alternative hypothesis. This hypothesis argues that long run relationship exist among variables. Conversely, if the calculated value of F-statistic is below the lower bound critical value then we accept null hypothesis, so in this case there exist no long-run relationship. If the calculated value of F-statistics lies between the lower and upper bound critical values then we are indecisive about the relationship. Long run parameters are estimated if long run relationship is established

Hence long run parameter can be estimated by following equation (4.8), if long run relationship is established.

$$GDP_t = \alpha_{12} + \sum_{i=1}^{p} \theta_{12i} GDP_{t-i} + \sum_{i=0}^{q} \theta_{22i} PI_{t-i} + \sum_{i=0}^{q} \theta_{32i} OPN_{t-i} + \sum_{i=0}^{q} \theta_{42i} FE_{t-i} + \sum_{i=1}^{q} \theta_{52i} PE_{t-i} + \sum_{i=1}^{q} \theta_{62i} \Delta LB_{t-i} \quad (4.8)$$

The short term dynamics of ARDL specification can be found by estimating following equation (4.9).

$$\Delta GDP_t = \alpha_{13} + \sum_{i=1}^{p} \theta_{13i} \Delta GDP_{t-i} + \sum_{i=1}^{q} \theta_{23i} \Delta PI_{t-i} + \sum_{i=1}^{q} \theta_{33i} \Delta OPN_{t-i} + \sum_{i=1}^{q} \theta_{43i} \Delta FE_{t-i} + \sum_{i=1}^{q} \theta_{53i} \Delta PE_{t-i} + \sum_{i=1}^{q} \theta_{63i} \Delta LB_{t-i} + \boldsymbol{\Psi_1} ECM_{1t-1} \quad (4.9)$$

Where ECM term is defined as

$$ECM_t = \quad GDP_t - \alpha_{12} - \sum_{i=1}^{p} \theta_{12i} GDP_{t-i} - \sum_{i=0}^{q} \theta_{22i} PI_{t-i} - \sum_{i=0}^{q} \theta_{32i} OPN_{t-i} - \sum_{i=0}^{q} \theta_{42i} FE_{t-i} - \sum_{i=1}^{q} \theta_{52i} PE_{t-i} - \sum_{i=1}^{q} \theta_{62i} \Delta LB_{t-i}$$

In the equation (4.9), the parameters having summation sign show the short-run parameters and parameter with ECM term ($\boldsymbol{\Psi}$) represents the speed of adjustment to long-run equilibrium. To attain convergence, coefficient of ECT term should have negative value and statistically significant.

CHAPTER V

Empirical Results

Short term and long term relationship among economic growth and government spending (Federal and Provincial), real private investment, openness (exports plus imports) and labor force using ARDL approach are presented in this section.

In first specification, we have used total federal government spending and total provincial spending as dependent variable along with other variables to capture their impact on economic growth. In second specification we have excluded interest payments and defence spending from federal and provincial spending to capture actual impact of government spending on growth and to analyze whether impact of government spending remains the same. The analysis begins with the summary statistics and unit root test.

Table 5.1: Summary Statistics of Data

	Mean	Med	Max	Min	Std. Dev.
Lab	4.841553	4.843399	5.246340	4.368688	0.258174
Open	9.783087	9.840803	10.43038	8.806043	0.468819
PI	4.083277	4.074621	5.906796	1.959662	1.251620
FE	8.960979	9.003025	9.624914	8.224481	0.376657
FEED	8.565863	8.572836	9.448035	7.829760	0.442358
FEEDI	8.567171	8.567558	9.442713	7.815242	0.460366
FEEI	8.577534	8.534198	9.272263	8.106966	0.316245
GDP	15.48111	15.51516	16.22589	14.52498	0.483790
PE	8.224870	8.268565	8.948056	7.225258	0.461334
PEEI	8.193110	8.200160	8.941224	7.214398	0.460357

Descriptive statistics of variables under study is reported in Table 5.1. Two measures of central tendency, Mean and median are used. As reported in the Table 5.1, mean and median are almost same for all variables. This shows that all variables have symmetrical distribution. Spread of variables is measured by standard deviation. Private Investment is highly volatile variable as depicted in its maximum and minimum range. On the other hand, labor force and federal spending and GDP are less volatile variables as indicated by maximum and minimum range.

5.1 Unit Root Test

Stationary of data is checked by Augmented Dickey Fuller Test and results of unit root test are presented at below mentioned Table 5.2. The results indicate that GDP growth and Government Spending (Federal and Provincial), private investment, openness (exports plus imports) and labor force are non-stationary at level; though they are stationary at first difference. The augmented dickey fuller test statistic is grater then test critical values, hence the null hypothesis that "series is not stationary" is rejected. Thus all variables are integrating of order one I(1).

Table5.2: Augmented Dickey Fuller Test Results

Variables	Test for Unit Root	Included in Test Equation	P-Statistics		Results
			ADF Test Statistics	Critical value (5% level)	
GDP	Level	Intercept	-1.61	-2.94	I(1)
		Trend and intercept	-2.29	-3.54	
	Ist Difference	Intercept	-3.77**	-2.94	
FE	Level	Intercept	-1.23	-2.94	I(1)
		Trend and intercept	-2.18	-3.54	
	Ist Difference	Intercept	-6.40**	-2.94	
PE	Level	Intercept	-1.69	-2.94	I(1)
		Trend and intercept	-2.03	-3.54	
	Ist Difference	Intercept	-4.73**	-2.94	

PI	Level	Intercept	-0.14	-2.95	I(1)
		Trend and intercept	-2.22	-3.54	
	Ist Difference	Intercept	-6.31**	-2.94	
Open	Level	Intercept	-2.21	-2.94	I(1)
		Trend and intercept	-2.12	-3.54	
	Ist Difference	Intercept	-6.28**	-2.94	
Lab	Level	Intercept	-2.148	-2.94	I(1)
		Trend and intercept	-2.07	-3.54	
	Ist Difference	Intercept	-5.42**	-2.94	
FEEDI	Level	Intercept	-0.59	-2.94	I(1)
		Trend and intercept	-2.48	-3.54	
	Ist Difference	Intercept	-6.12**	-2.94	
PEEI	Level	Intercept	-1.47	-2.94	I(1)
		Trend and intercept	-1.94	-3.54	
	Ist Difference	Intercept	-4.68**	-2.94	

Note: The Critical Values are 5% significance level. The ***, ** and * indicates significance at 1% ,5% and 10% level respectively.

At 5% level of significance, the results of ADF test show at 5% level of significance all variables are integrated of order one according to result of ADF test. Moreover, no under study variable has integration of order two. Hence we can proceed to the next step of analysis safely as basic pre-requisite to conduct bound test is met.

5.2 Co-integration Testing

To estimate the model, log-log specification is adopted. Co-integration technique called as Auto Regressive Distributive Lag (ARDL) Model introduced by Pesaran, et al (2001) has been used. In first specification, we have used total federal government spending and total provincial spending as dependent variable along with other variables to capture their impact on GDP growth. In second specification we have excluded interest payments and defence spending from federal and provincial spending to capture actual and real impact of government spending (federal and provincial) on economic growth.

5.2.1 Bound Test for Co-integration

In first step, existence of long run relationship among the variables is checked by estimating ARDL equation (4.7), θs represent the short run dynamic relationship whereas γs represent the long run relationship.First of all to test co-integration, Bound Test using F-test with critical values is used. As the F-test is sensitive to numbers of lags adopted, Vector Autoregressive Model (VAR) is estimated for selecting optimum numbers of lags. By adopting and Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC), one lag is selected. The results of the F-Statistics of bounds test for equation (4.7) for both specifications are presented in Table 5.3.

Table 5.3: Result of Bound Test

F-Statistics for Co-integration Relationship				
Equation	**F-Statistics (Calculated)**	**Critical F-Statistics at 5% level**		**Result**
		I(0)	I(1)	
Specification 1	6.24	2.62	3.79	Co-integration Exists
Specification 2	5.64	2.62	3.79	Co-integration Exists

As we can see that the calculated value is greater than the upper bound critical value in both specifications. Hence long run relationship is established between GDP growth and government expenditures along with other variables.

After confirming the existence of long-run relationship between government expenditures and GDP growth along with other variables based on the equation (4.7), we can get the long run and short coefficients of government expenditures and economic growth along with the other variables which are as below.

5.2.2 Long Run Relationship between Economic Growth (GDP) and Government Spending along with other Variables (Specification 1)

$$GDP_t = 8.51 + 0.93LAB^* + 0.04OPEN + 0.08PI^* - 0.08FE^{**} + 0.28PE^*$$

5.2.3 Short Run Relationship between Economic Growth (GDP) and Government Spending along with other Variables (Specification 1)

$$\Delta GDP_t = 0.16\Delta LAB + 0.02\Delta OPEN + 0.05\Delta PI^* - 0.05\Delta FE^{**} + 0.17\Delta PE^* - 0.61ECM^*_{t-1}$$

5.2.4 Long Run Relationship between Economic Growth (GDP) and Government Spending along with other Variables (Specification 2)

$$GDP_t = 8.35 + 1.01LAB^* + 0.06OPEN + 0.09PI^* - 0.08FE^* + 0.24PE^*$$

5.2.5 Short Run Relationship between Economic Growth (GDP) and Government Spending along with other Variables (Specification 2)

$$\Delta GDP_t = 0.24\Delta LAB + 0.03\Delta OPEN + 0.05\Delta PI^* - 0.05\Delta FEEDI^* + 0.14\Delta PEEI^* - 0.60ECM^*_{t-1}$$

Note: *Indicates the significance at 1%, ** Indicates the significance at 5%

5.3 Interpretation of Results

The first important result of study is that economic growth (GDP) and government spending have long run relationship. The co-efficient of federal spending is negative and statistically significant both in long-run as well as in short run. On the other hand, co-efficient of provincial spending is positive and statistically significant both in short-run as well as in long-run.

Results indicate that relationship between federal spending and growth is negative, while relationship of provincial spending and growth is positive.

The result of the study supports the fact that fiscal decentralization has positive association with economic growth. Economic rationale behind this finding is that fiscal decentralization improves the efficiency of allocation of resources. It means that decision about public expenditure spending by the level of government closer to people whom it is serving, is more likely to be actual demand of the people. Hence, it increases the allocative efficiency of the resource. This process also improve the relative financial accountability as provincial governments are directly answerable to their people. Fiscal decentralization also increase the service delivery of public spending as local officials are better able to respond to changing local requirement of services and infrastructure.

All these factors may be responsible for positive relationship between provincial government spending and growth rate of Pakistan. Federal government spending on the other hand may be lacking allocative efficiency of resources due to which it is not as effective as provincial spending to spur the economic growth. In the same way, a major chunk of federal spending is in respect of current expenditures which is usually not growth supportive. Federal spending may not have direct positive impact on the growth; however, it may have positive spillover effect for private investment which has positive impact on growth according to findings of this study. The result regarding federal spending is line with the findings of Gani and Din (2006) which also finds negative relationship between public investment (total) and economic growth of Pakistan. The result of this study is also in line with the findings of Faridi (2011) for Pakistan which also argues that fiscal decentralization raises efficiency of public sector and also augments the long run growth and development.

The co-efficient of private investment and labor force has positive signs which show that they effect positively to growth which is in line with standard economic theory. Ghani and Din (2006) also find that private investment positively affects economic growth. Conversely, our results indicate that openness which includes exports and imports volume has insignificant impact on growth. One of the reasons of this result may be that volume of our trade is too small to impact the growth rate.

The co-efficient of ECM term is negative and significant which indicates adjustment takes place towards equilibrium.

5.4 Diagnostics Tests

Various diagnostics tests for subject Model are presented below. This model passes all diagnostics tests.

Table 5.4:Result of Diagnostics Tests

Test Statistics	**F-Stat**	**Probability**
Serial Correlation LM	0.061	0.8062
Normality (Jarque Berra)	1.04	0.59
Heteroscedasticity Test	2.04	0.0841

5.5 CUSUM and CUSUM of Squares Test

Stability of model is checked by graphs of CUSUM and CUSUM Squares Tests which are presented below.

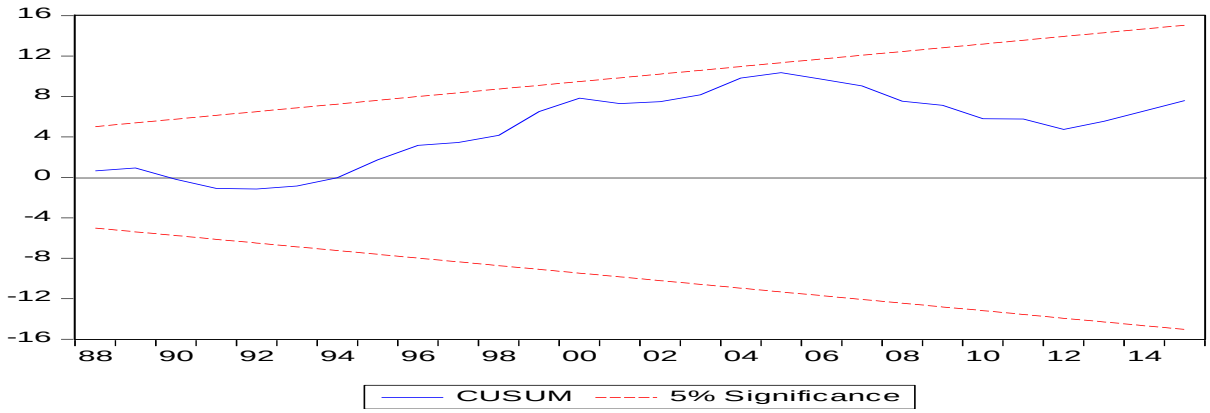

Fig: 5.1CUSUM Graph for Testing Structural Stability of Model

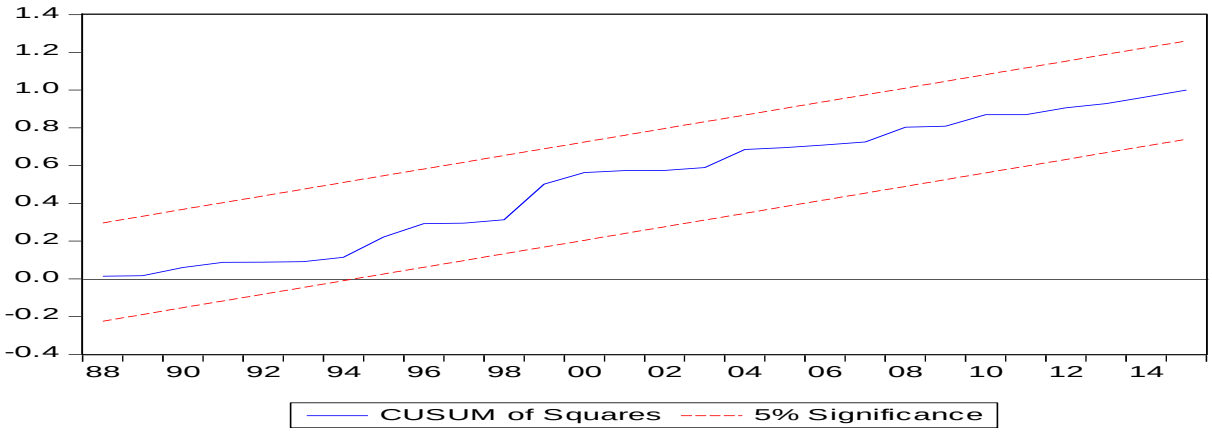

Fig: 5.2 CUSUM Graph for Testing Structural Stability of Model

Graph of cumulative sum of the recursive residuals (CUSUM) and cumulative sum of the recursive residuals squared (CUSUMSQ) for Model show that the model is stable as the CUSUM and CUSUMSQ is within 5% of critical values.

CHAPTER VI

Conclusion

The focus of this study has been to study the impact of government spending on economic growth of Pakistan. In earlier studies related to subject matter, researchers have explored different dimensions of this issue. However, this study distinguishes itself from other studies by segregating government spending into federal and provincial spending, and then analyzes its impact on growth whether dynamics of federal and provincial spending are same or not.

Impact of government spending (Federal and Provincial) along with other variables i,e private investment, openness and labor force on economic growth is empirically tested over the period 1979-2015, by using ARDL approach to co-integration. The result of the study depicts that government spending and economic growth of Pakistan has significant relationship. Provincial spending positively effects economic growth as compared to federal spending. According to results of this study, federal spending does not have direct positive impact on economic growth; nevertheless, federal spending may have a spillover effect which spurs private sector investments in an economy. This study also finds that private investment and labor force have significant positive impact on economic growth. Conversely, openness (imports plus exports) has insignificant impact on economic growth. This might be due to small share of trade volume in our economy.

Our findings suggest that spending at provincial level is more beneficial for growth as compared to federal spending. This finding supports the idea of fiscal decentralization and subsequently more spending by provincial/local level as compared to federal spending in the country. Moreover, result of this study supports shifting of more resources towards provinces as depicted in National Finance Commission Award (7th). In 7^{th} NFC Award, resource distribution

criterion has been changed in favor of provinces. Share of provinces in divisible pool has been enhanced from 47.5% to 57.5% and federal share has been decreased to 42.5% of divisible pool. Using a criteria which uses multiple indicators i.e. population (82%), poverty or backwardness (10.3%), revenue collection and generation (5.0%), and area or inverse population density (2.7%), share of provinces in resource distribution has been increased. After implementation of 7th NFC award resources towards provinces from divisible pool has been increased from Rs. 574 billion in FY10 toRs.1477 billion inFY15 which shows an increase of three times.

Moreover, after 18th amendment in constitution of Pakistan, seventeen federal ministries have been devolved to provinces. These ministries include social sector ministries i.e education health and social welfare. More autonomy has been given to provinces after this amendment. 7th NFC award has increased the financial muscle of provinces to fund the projects related to these ministries/sectors. Both NFC award and 18th amendment has also allowed the provinces to generate its own revenue through imposing new taxes. Therefore, now it has become responsibility of provinces to spend and invest in economy especially in the social sector to boost the economic growth of the country.

Results of this study imply that resource distribution of 7th NFC award and shifting of ministries to provinces through 18th constitutional amendment of Pakistan is a step towards right direction as spending by provincial governments has positive impact on growth. Provinces are more aware about the local needs of population; thus it increases the allocate efficiency of resources. This also enhances the accountability of government as provincial/local government is directly answerable to public. Fiscal decentralization also increase the service delivery of public spending as local officials are better able to respond to changing local requirement of services and infrastructure. All this process positively supports the economic growth of the country.

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Annexure

Annex-I

Table: Government Expenditures (As percentage of GDP)

Country	Government Expenditure (As % of GDP)
Pakistan	20
India	27
Bangladesh	16
China	24
USA	42
Finland	55
France	56
UK	49

Source: Index of Economic Freedom 2014 by the Heritage Foundation and the Wall Street Journal

Annex-II

Table: Transfers to Provinces (Pre-Post 7th NFC award Comparison) (Rs. in Billion)

	Year	Divisible Pool	Straight Transfer	Special Grants	Total	Divisible Pool as % of total FBR tax Collection
Pre 7th NFC Period	2004-05	205	41	35	281	35
	2005-06	245	57	64	366	34
	2006-07	321	70	29	420	38
	2007-08	391	66	33	490	39
	2008-09	477	82	41	600	41
	2009-10	574	81	82	737	43
Post 7th NFC Period	2010-11	835	163	54	1052	54
	2011-12	1063	146	54	1263	57
	2012-13	1118	104	61	1283	58
	2013-14	1287	124	54	1465	57
	2014-15	1477	97	34	1608	57

Source: Economic Survey of Pakistan 2010-11, 2012-13, 2013-14 and Budget Brief 2014-15, 2015-16.