Interest Payments, Fiscal Deficit and Economic Growth
***: A Case Study Of Pakistan*[24]**

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Abstract

The huge fiscal deficit negatively affects economic growth in the long run consistent to results of Mohanty (2013). The findings coefficient of FD is -0.44 indicate that there is a negative and significant relationship between fiscal deficit and economic growth in the long run. Coefficient of DEXP is 0.71 and has a positive and significant impact, so that it will enhance the productivity of both human capital and physical capital, which increases economic growth. Fiscal deficit for capital expenditure is not a problem up to some threshold level. Auto Regressive Distributive Lag (ARDL) model, error correction model (ECM), impulse response function and variance decomposition are used for time-series data analysis. Interest payments have a negative and significant coefficient, which analysis the negative correlation between growth and interest payments. The lagged value of the error correction term is negative and significant. It is showing convergence from short-run disequilibrium towards the long-run equilibrium so, a short-run relationship also exists among variables of interest payments, fiscal deficit, development expenditure and economic growth.

Key Words: Fiscal deficit, Interest payments, Economic growth, Development expenditure

JEL classification: C87, E21, F65, H61, H62, P35.

1. INTRODUCTION

Consequent to global financial crises, a sharp recession occurred in the world economy in general and in United States and the Europe in particular. Measures recommended, to coup this crisis are decreasing current account deficit, the wide range in trade adjustment and shift demand from foreign to domestic sources. A number of fiscal stimulus packages were practiced in many countries including Pakistan. However, a Keynesian type model with excess demand and rigid prices determined the output at required level. These models consider the

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possibility of crowding out which can occur due to changes in exchange rate and movements of interest rate. This crowding out reduces the efficacy of fiscal policy and its multipliers and economic growth. Hence there is need to focus on interest payments, fiscal deficit, development expenditure and economic growth.

The significance of this issue shoots from the statement that the effectiveness of fiscal policy is diligently linked to saving investment gap needed foreign savings which mirrors in the in the balance of payments and current account deficit. The relationship of economic growth and fiscal deficit is of the paramount importance. Macroeconomic stability and sustained economic growth up to target seems to be a fantasy in the underdeveloped economies. Burning economic issues of fiscal deficit came under discussions in recent times because it persisted at a high level which is a severe danger to economic stability in Pakistan. It is imperative to observe and analyses macro-economic conditions such as government expenditure, revenues, fiscal deficit and external balance.

Pakistan was marked as the developed state of South Asia until the decade of the1980s, with an average growth rate of 6 percent. The major reason for this impressive performance was the availability of external capital. Pakistan witnessed the lowest GDP growth rate among the countries of world and this was attributed to the sharp decline in capital inflows, high inflation, low saving and ultimately decline in investment.

Table1: Real GDP Growth Rates (%)

Region/Country	**2009**	**2010**	**2011**	**2015**
World GDPG	- 0.6	5.2	4.0	3.2
United States	-3.1	2.4	1.8	2.2
Canada	-2.8	3.2	2.6	1.8
Malaysia	-1.5	7.2	5.1	5.6
India	5.0	11.2	7.7	4.0
Pakistan	0.4	2.6	3.7	4.4

Source: IFS and Economic survey of Pakistan various issues

During the decade of 1990s, the Gross Domestic Products growth rate continued about 3.96% on average and the average inflation rate remained high i.e. 9.7%. The budget deficit remained 6.9% of GDP on average respectively in this decade; in addition, the current account

deficit remained an annual average of around 4.5% of GDP. During the 1990s, the Pakistan economy also faced some external shocks including economic sanctions, the September 11 event and tension on the Afghanistan border area. The upgrading in gross domestic products showed decreasing trend in the period of the 2000s which carried the problems of Vicious circle of poverty, rising inflation, high unemployment and raising fiscal deficit.

Fiscal deficit is defined as the situation in which government revenues are less than expenditures. The inability to raise tax revenues in the presence of a rapidly growing trend in the expenditures gained after 2007/08, when the country showed real GDP growth at its historic low of 0.4% of GDP. The emergence of the war against terror and the resulting increase in security spending aggravated the problem. High subsidies to public enterprises and the losses due to energy short falls result in public expenditure increased by almost three percentage points of GDP over the last six years. But the tax -GDP rate of about 10% of GDP, the budget deficit reached 6.2% of GDP in 2009-10. Main reason of persistent budget deficits is ineffectual and unproductive revenue collection.

Huge fiscal deficits work as the main cause of low national savings and create hindrances in path of investment and growth performance in the country. The steps taken to manage the fiscal deficits to bring them to a reasonable level by means of expenditures management plan, strict measures and improvement step in public sectors have come up with good results. Despite that the budget deficit stands amongst the most notable causes of economic progress and development,

Table2: Macroeconomic Performance

Variables/Years	1970s	1980s	1990s	2000-15	
Gross Domestic Product	4.8	7.4	3.96	4.1	Growths Rates
Saving	11.2	14.8	13.8	17.5	Percent of/GDP
Fiscal Deficit	5.6	7.2	6.9	4.9	“
Current Account Deficit	5.2	3.9	4.5	3.5	“
Inflation	12.2	7.3	9.7	7.5	“

Sources: IFS and Economic survey of Pakistan various issues

The issue of fiscal deficit got noticed in Pakistan in the late nineties when the fiscal deficit to GDP ratio rose to above 6.9 percent while average annual growth rate is about 4 percent in Pakistan. In the early nineties, it was above 7 percent, and it started rising again. The annual average fiscal deficit is 6.4 percent of GDP in last thirty-five years. The question arises, whether the high budget deficit hinders economic growth in Pakistan and how it has affected the country's economic growth over the last four decades?

The government has to finance its expenditures and investments. The chronic and high level of fiscal deficit creates problems when it is financed by different modes of financing. Deficit financing has three major sources: external borrowings; printing money; and through internal borrowings (both bank and non-bank borrowings). External borrowings worsen Balance of Payments and creates heavy burden of interest payments which makes deficit financing unbearable. Printing money directly leads to rising inflation. Domestic borrowings both bank and non-bank borrowings causes crowding-out of private investment and raises domestic debt. Extra use of any specific type of financing of budget deficit has hostile macro-economic impacts. Printing money causes inflationary pressures, domestic credit financing increases interest rate and crowds out private investment while external debt financing of budget deficit can worsen the balance of payment problem and appreciation of exchange rate ultimately results in debt crisis.

Owing to facing financial crunch from the beginning, Pakistan has to depend on internal and foreign debt. Ultimately, it has to expend substantial share of its GDP on the interest expenditures of debt. If we look at the debt servicing as a percentage of GDP in the economy, again very disappointing that pace of debt servicing is more than our GDP growth rate. With the exception of the period 2006-06 and 2010-11the total debt servicing is oscillating around 5 percent. On the other hand, interest payments go on 3.8% of its GDP throughout the 1980s while it continued on 6.8 % of GDP, during 1990s and this ratio decrease to 5.1% of GDP in the period of 2000-15.

Table3: Fiscal Deficit Interest Payments Development Expenditure (As Percent of GDP)

	1970s	**1980s**	**1990s**	**2000-15**
Development Exp.	-	7.3	4.7	3.4
Interest Payments	-	3.8	6.8	5.1
Fiscal Deficit	**5.6**	**7.2**	**6.9**	**4.9**

Source: IFS and Economic survey of Pakistan various issues

In Pakistan the decline in development expenses has harmfully impacted the economic growth from three dimensions. Insufficient expenditures on human capital in sectors of health and education have been overlooked which is necessary for sustainable development. Secondly, curtail in government investment, particularly in public sectors projects, water storage dams producing cheap electricity, coal, wind, solar energy sectors, roads and infrastructure. This decrease in development spending creates unfavorable environment for foreign and domestic investor, which ultimately decrease total investment. (Zaidi, 1999).

While fiscal deficit is one the important variables moving economic growth, however, very small number of research works have been found on this topic in Pakistan (Shabbier al., 1992; Khilji et al., 1997).Only a limited research literature is available regarding the impact of major macroeconomic variables on economic growth in Pakistan (Haque and Montiel, 1991; Ahmad and Qayyum 2008; Javid et al. 2010). Fatima et al. (2011) used applied two stage least squares (2SLS) and simultaneous equation model to data set of 1980-2009 and concluded that budget deficit directly or indirectly affects economic growth. Negative relationship between economic growth and public debt was estimated by Qureshi et al. (2010) using the data set of 1981-2008, with the help of ordinary least squares (OLS) in Pakistan. Mukhtar and Zakaria (2008) used Granger causality tests and error correction model (ECM) on data set of 1960-2005 and found a long-run positive and significant relationship between nominal interest rate and fiscal deficit.

The study regarding the interest payments, fiscal Deficits and Economic Growth" in economy of Pakistan is very important because the economy is facing the problem of lack of financial resources, less public and private savings and heavy debt burden on it. To the best of

our knowledge, there has been no study that analyzed the short-run and long-run multidimensional impact regarding the efficacy of fiscal policy on macroeconomic variables in Pakistan. The present study will not only explore and analysis the puzzle regarding fiscal deficit and impact of fiscal policy on economic growth in Pakistan.

The rest of the study is organized as follow: Literature review is contained in the next part. Basis of analytical research and econometric methodology are explained in the third part. Empirical results of phenomena of fiscal deficit, interpretation of results regarding the relationship among, interest payments, government developmental expenditure and economic growth in economy of Pakistan. Finally, conclusion and policy recommendations are given in the end followed by references.

2. Literature review

Feldstein (1983) found that higher fiscal deficits were a cause of higher interest rate and higher dollar exchange rate and deterioration of the trade balance. This conclusion proved a guide for researchers to estimate the link between fiscal and trade deficits. Initially empirical studies were conducted in the United States and in 1990, reduced form structural models, VARS, multiple equation, co-integration and error correction models are the econometric techniques used to estimate the results from budget to trade deficits.

Miller and Russek (1989) provided the proof that fiscal deficits caused trade deficit. This relationship appears relatively strong–that is, a $1 variation in the fiscal deficit ultimately leads to approximately a $1 change in the trade deficit

Abell (1990) used VAR model approach in United States and found that budget deficits caused trade deficit indirectly via change in interest rate and exchange rate through the transmission mechanism of fiscal policy.

Corsetti and Muller (2006) found that the link between twin deficits depends upon degree of openness and nature of fiscal expansions. They employed structural VAR model to data for Australia, Canada, United Kingdom, and United States. According to results the evidence of twin deficits was stronger in United Kingdom and Canada as they were more open as compared to United

Kim and Roubini (2008) employed VAR model to empirically estimate the impact of government budget deficit shocks on the current account and the real exchange rate, particularly in the period of flexible exchange rate regime. They found that contrary to the forecasts of

determined academic models, the "twin divergence" an additional common story of the ancient data was revised i.e., the current account improved when fiscal accounts worsened and vice versa.

Perotti (2007) used SVAR and found the value of output multiplier between 0.72 and 0.98 for quarterly data and annual data series in U.S.A. On the other hand, results for U.K, Canada and Australia showed smaller multipliers. For Australia the estimated output multiplier was 0.68 for annual data and consumption multiplier was very small i.e. 0.5 and it was also insignificant. Economists have the view that increase in the government spending will be a source of little decrease in the rates of inflation and growth, and majority of the empirical results are agreed to this conclusion. Rational economists do not agree on the general influences of reduction of government spending on goods and services: Neoclassical models present that private consumption and the real wage will go down, while some Neo-Keynesians forecast the different.

Mountford and Uhlig (2009) used new technique of sign restrictions on VAR to assess the effectiveness of fiscal policy. They announced that fiscal changes effects fiscal variables later but not at present. They have examined three changes, deficit spending: deficit financed tax cut and growth in balanced budget spending and discovered that deficit tax cuts best among three financing techniques.

Leeper, *et al.*, (2008) used impulse response function and offered a formal interpretation of the narrative approach to identifying fiscal policy and found the results similar to Dynamic stochastic general equilibrium (DSGE) model.

Abbas *et al.*, (2011) analyzed the relationship between fiscal balance and current account balance using a data set of 135 countries during 1975–2004 with the help of random effects GLS regression, panel vector auto-regression (VAR) and other econometric techniques. As they have suggested, on average, a growth in the fiscal balance of 1 percentage point of GDP is related to a current account upgrading of around 0.3 percentage point of GDP. The impact was comparatively weak during the episodes of large fiscal policy and current account changes. It suggested that fiscal policy may have a far limited role in adjusting large external imbalances and evidenced to be a week link between current account and fiscal imbalances as a percentage of GDP.

The IMF regression analysis tried to estimate fiscal policy effects on real GDP growth, monetary policy and other sources of demand. According to IMF results for advanced economies 1 percent increase in fiscal stimulus leads to 0.1 percent increase in real GDP growth and up to 0.5 percent after three years. The IMF's findings revealed that revenue based changes in fiscal policy are more effective

than expenditure based changes to boost up real GDP in advanced economies.

Mountford and Hulling (2009) in U.S.A. used VAR analysis to find different finance increases and diverse finance tax cut multipliers to be 0.47 for balanced budgets and 0.91 for various spending and 3.8 for tax cut, which is bigger in comparison to earlier studies.

Gupta *et al.,* (2005) studied the data of 39 countries and instigate that 1% decrease in deficit-to-GDP ratio resulted in rise real growth of per capita 0.25 to 0.5 percent in the short run.

Hakro (2009) found a negative relation between taxation and per capita growth for 21 Asian countries. Lower tax rate and financing through resources mobilization induced more growth. A statistically significant relationship between government expenditure and per capita growth rate was also observed.

Ali, *et al.,* (2010) studied impact of the effectiveness of fiscal policy on macro-economic variables in Pakistan by using (ARDL) approach. They found that fiscal deficit has a negative impact on economic growth in Pakistan. Variance decomposition analysis explained a stronger impact of fiscal policy on economic growth through the channel of exchange rate. Consumption, investment and inflation did not play a significant role to stimulate their economy. However, the impact is stronger in long run as compared to short run.

Shaheen and Turner (2010) followed the Blanchard and Perroti and analyzed the effectiveness of fiscal policy using SVAR with five variables (GDP, Interest rate, and Net Taxes, Inflation and Government expenditure). She proved with empirical evidence that change in GDP and inflation is due to significant role of Government expenditure and taxes in Pakistan. She also concluded that fiscal policy can enhance economic activity via increase in expenditure at the risk of higher inflation and decrease output in medium term. Fiscal consolidation can be attained by imposing more tax burden in short run but at the risk of slow down economic growth in long run.

Akosah (2013) used quarterly data from 2000-2012 for Ghana to study the relationship between high fiscal deficits and slow economic growth. The results explained that economic growth and fiscal deficit had inverse long-run relationship, especially, when fiscal deficit was used to finance current expenditure. In the short run he found that fiscal deficit above the threshold level of 4% of GDP was harmful to economic growth.

Rahman (2012) analyzed the relationship of economic growth and fiscal deficit by using the quarterly data of 2000 to 2011 and found that productive expenditure and economic growth have significant and

long run relationship in case of Malaysia, while the similar results were not found in the case of non-productive expenditure, and relationship between fiscal deficit and economic growth.

Mohanty (2013) studied data set from 1970 – 2011 using Johnson co-integration test and Vector Error Correction Model (VECM) and found negative and significant relationship between economic growth and budget deficit in the long run. Gross domestic product decreased by 0.22 present with an increase of one percent in fiscal deficit. The results confirmed the new-classical theory that Gross Domestic Product (G.D.P) decreases with the increase in fiscal deficit. He suggested investment in education health, roads and power to improve the productivity and decrease the subsidies.

Qureshi *et al.,* (2010) using the ordinary least square method on the data set of 1981-2008, predicted inverse relationship between public debt and economic growth in Pakistan.

Mukhtar *et al.,* (2007) using co-integration technique, simultaneous equation model and Granger causality test, on the data set of 1975-2005 in the case of Pakistan proved that fiscal deficit had significant and positive impact on current account deficit. The study predicted that current account improves due to increase in private savings.

Bilquees (2003) in her research study "Analysis of budget deficit, debt accumulation and debt instability" in case of Pakistan, by using co-integration technique, predicted negative and significant relationship between budget deficit and debt.

According to Mirdala (2013) the geneses and inferences of the existence of twin deficits in the big countries appear to be a concentration, realistic as well as theoretical assessment for decades. The validity of direct association between current and fiscal account deficits converted in many developed and low-income countries apparently not found in the period of business cycle and expansions in basic economic indicators.

Chaudhary and Shabbir (2005) used data set of (1965-99) with the help of ordinary least square (OLS) technique analyzed major impacts of budget deficit on Pakistan foreign sector related and explained a positive relationship between output growth and domestic credit.

Qayyum, *et al.,* (2008) used simultaneous equation model for the data set (1960-2005) and investigated crowding in effect of budget deficit in Pakistan. They verified significant link among bank borrowing, domestic non-bank borrowings and fiscal deficit.

Chaudhry and Munir (2010) has confirmed that in the short run rate of interest and remittance as percentage of GDP were positively motivating savings. In the long run, exports earnings had encouraging influence on national savings of Pakistan.

Waqas and Awan (2011) using annual data for the period of 1973-2009 in case of Pakistan checked the Ricardian equivalence hypothesis. Results of Johansen Cointegration technique showed a long-run relationship among the variables of structural form consumption function and invalidated the Ricardian equivalence hypothesis.

Afzal (2012) gave proofs in favor of Ricardian equivalence hypothesis (REH), for Pakistan over the period 1960-2009. He determined the impact of shocks of one economic variable upon other economic variables. The impact is considerable through impulse response functions that provided some support in favor of the REH.

According to Sumaira and Arshad (2012) very limited research has been conducted for testing the validity and consistency of the Ricardian equivalence hypothesis in low income countries. In this direction an effort has been made to empirically test the prudence of Ricardian equivalence hypothesis, by using cointegration analysis. Empirical results nullified the RE hypothesis in Pakistan.

Chinn, (2017). Informed by empirical estimates of the determinants of current account imbalances encompassing the period after the global recession, I find that factors driving the global saving glut have had limited explanatory power for the time series variation in imbalances. Fiscal factors determine imbalances, and have accounted for a noticeable share of the recent variation in imbalances, including in the US and Germany. It is concluded that hypothesis of twin deficits is valid for the country group analyzed. The theory of triple deficit is partially valid for the group of developing countries (Arzu Tay Bayramoğlu, 2018).

3. METHODOLOGY

Neoclassical, Keynesian and Ricardian are three schools of thought concerning the economic belongings of fiscal deficit. Among the majority logical perspectives, the neoclassical view reflects fiscal deficits unfavorable to investment and growth. The Keynesian founds a key role and gives little consideration to long run effects. On the other hand, Ricardian consider that fiscal deficits do not really bear any significance except smoothing expenditures.

The public deficit can be rewritten:

Fiscal deficit = Public investment – Public savings (1)

Fiscal deficit= (Private savings – Private investment) + Foreign savings (2)

The Keynesian theory emphasizes aggregate demand increase in short run with increase in consumption due to decrease in taxes. Consumption boost is partially offset by crowding out effects and investment decreases due to higher interest rate and exchange rate appreciates by decreasing net exports.

In the long run increase in interest rate bumpers capital accumulation and economic growth. Along with these long term effects on growth fiscal policy has little economic effect in short run. The full Ricardian equivalence is deficient in developing economies because of un-realistic assumptions of the theorem.

3.1 FISCAL DEFICIT AND GROWTH NEXUSES

Similarly, to analyses the role of fiscal deficit and economic growth for the economy of Pakistan the following econometric model will be estimated. We follow the concepts Nickel & Tudyka (2013).

$$GDPG = \delta_0 + \delta_1 DEXP + \delta_2 FD + \delta_3 IP + \varepsilon_t \quad (3)$$

Where Gross domestic product growth rate (GDPG), development expenditure, (DEXP), interest payments, (IP), fiscal deficit (FD) to-GDP ratios and ϵ_t is the normally distributed error term.

3.2 UNIT ROOT TESTS

Most of the time-series are not stationary and as such Ordinary Least Square (OLS) produces spurious results (Engle and Granger, 1987). Therefore, we check the Stationary of time series through various unit root tests, before running the regression.

3.3 CO-INTEGRATION TEST

Many techniques are available for cointegration analysis, i.e. Engle and Granger (1987), Johansen (1991), Johansen (1992), Johansen (1995) and Johansen and Juselius (1990). These techniques require that all variables must be stationary at the same level of integration i.e. I (0) or I (1). So these techniques cannot be applied if variables have mixed order of integration. ARDL technique can be used if mixed order of integration is found in variables of the model i.e. I (0) and I (1) (Pesaran and Pesaran, 1997). The difficulties caused by non-stationary of data can also be evaded by applying an ARDL technique (Laurenceson and Chai,

2003). Through a simple linear transformation, the Error Correction Model (ECM) can be derived from ARDL model. ECM captures the short-run dynamics without losing long-run information (Banerjee et al., 1998).

The general form of ARDL model developed by Pesaran et al. (2001) is given below:

$$\Delta z_t = \alpha + \lambda z_{t-1} + \sum_{i=0}^{q} \varphi_i \Delta x_{t-i} + \sum_{i=1}^{p} \phi_i \Delta y_{t-1} + \varepsilon_t \quad , \qquad t=1,\ 2,\ldots,\ n \tag{4}$$

Where Δ is a first difference operator, z is the vector of both x and y. x is the vector of independent variable, y is the vector of dependent variables, t is a variable for the time period, i is to capture the optimum lag length, α is the intercepts and φ and φ are the vectors of coefficients.

Owing to non-stationary of some of the variables, incorrect lag selection for small sample size and endogeneity problem etc. we emphases on the ARDL.

The F-Statistic is calculated on a system of equations after selection of optimum lag length for each variable separately in the model with the null hypothesis of no cointegration. The F-Statistic is compared with lower and upper bound critical values generated by Pesaran et al. (2001) to test the cointegration among the variables of the model.

The long-run estimates are calculated by the following equation:

$$\gamma_i = \frac{\hat{\varphi}_i(1,\hat{q})}{\hat{\phi}_i(1,\hat{p})} = \frac{\sum_{i=0}^{\hat{q}} \hat{\varphi}_i}{1 - \sum_{i=1}^{p} \hat{\phi}_i}, \forall i = 1,2,....,k \tag{5}$$

Where k is selected lag length for p and q.

3.4 VECTOR AUTOREGRESSIVE SYSTEM

A small number of economists have investigated fiscal policy in a VAR methodology (Heppke-Falk et al. 2004). However, researchers such as Kremers et al. (1992) found some drawbacks in the traditional time series cointegration techniques e.g. problem of endogenuity and inappropriate lag selection for small sample size etc.

Blanchard and Perotti (1999), Perotti (2005, 2007), and Castro (2003) used VAR methodology to investigate the effects of fiscal policy on macroeconomic aggregates.

Our basic VAR models consist of [GDPG, DEXP, FD, IP] variables.

3.5 IMPULSE RESPONSE FUNCTION

The cointegration equations above are parts of (VEC) model (Hamilton & Susmel, 1994) which pathways short term prediction of the variables, according to the Granger–Eagle representations theorem. In short term shock of fiscal balance is assessed by its impulse responses. We use generalized impulse response approach which ensures that ordering of the variables of VEC model's is not necessary to be considered. (Pesaran and Shin, 1998) These are not sensitive to the sequencing of the variables in the VAR and display more fruitful results. In this paper we report results with the help of generalized impulse response function. Each figure shows the carries of a particular variable to one time shock in each of the variables found included in the model.

3.6 VARIANCE DECOMPOSITION

Impulse response to any variable can be determined and decomposition of variance of its forecast error is also possible. Thus one can measure the comparative importance of the budget balance at each of period by determining its comparative contribution to the forecast errors variance of other variables.

We produce impulse response functions on the foundation of estimated VAR models based on its reduced form. When the VAR is estimated these rejoinders supply an appropriate way, to condense the macroeconomic dynamics, generated by fiscal variations. Cumulative impulse responses are reported by simply accumulation of the impulse responses up to this horizon. Standard errors of the impulse response functions are calculated on the basis of 1000 replications by boot strapping.

It is value emphasizing that this research paper methodological innovation will provide advice for policy makers. From a methodological opinion, it does not embrace Erceg et al. (2005) or Corsetti et al. (2008)'s DSGE approach or does not choose panel data econometrics technique to investigate the hypothesis because all the countries did not implement within the same timeframe the same set of policies. It is based on lines of the publications on a VAR methodology by Kim et al. (2008), who overlooks the technique of cointegration. Instead, this study also used ARDL approach and adopts nonstructural approach not bound by any identification scheme.

3.7 MODEL SPECIFICATION

At first, the study checks the Stationary of data by applying ADF, PP and Ng-Perron unit root test to check the order of integration of variables. Subsequently ARDL cointegration technique is applied

based on selected lag length for each variable in the model. The study uses the squared R.BAR to find the optimum lag length for equation squared R BAR is known as best criteria for selecting the possible lag length. ARDL model is as follows:

Similarly, to analyses the role of fiscal deficit and economic growth for the economy of Pakistan the following econometric model will be estimated. We follow the concepts of Nickel & Tudyka (2013).

$$GDPG = \delta_0 + \delta_1 DEXP + \delta_2 FD + \delta_3 IP + \varepsilon_t \quad (6)$$

Where Gross domestic product growth rate (GDPG), development expenditure, (DEXP), interest payments, (IP), fiscal deficit (FD) to-GDP ratios and ϵ_t is the normally distributed error term. In equation,(6) first difference of per-capita gross domestic product is the dependent variable. The null hypothesis is (H0: $\delta_1=\delta_2= \delta_3= 0$). The alternate hypothesis is (H_1: $\delta_1\neq\delta_2\neq \delta_3\neq 0$) which shows the existence of a long-run relationship in the model, δ_0 is a constant and ε_t is the error term. The study uses the critical values of F-statistic generated by Narayan (2005) for small sample size. If the calculated value is greater than the upper bound of critical value, then we can reject the null hypothesis of no cointegration. If the calculated value is less than the lower critical bound, then we accept the null hypothesis and if the calculated value falls in between the critical values, then the decision are inconclusive. If cointegration occurs in the model, then calculation of coefficients is suitable in long-run and for short-run relationship error correction term can be used.

4. Empirical Results

The study uses the Augmented Dickey Fuller (ADF), Phillips-Perron and Ng-Perron tests to diagnose the problem of unit root in variables of the model. Results show that all variables are stationary at first difference with all tests used in the table. The overall results show the mixed order of integration I (0) and me (1). The study uses ARDL cointegration technique to find the long-run relationship in the model. The study finds the optimum lag length for ARDL model by using squared R-BAR to complete the information in the model.

Table 4: The calculated F-statistics ARDL model: Dependent variable is D (GDPG)

VARIABLES	F-Statistic (Calculated)	At 0.01		At 0.05	
		I(0)	I(1)	I(0)	I(1)
D(GDPG)	11.8853	3.5934	4.8908	2.9357	4.0778

The F-statistic is 11.8853 and is greater than the upper bound at 1% level of significance. The null hypothesis of no-cointegration is rejected and the alternate hypothesis of cointegration is accepted. The long-run relationships exist in the model (6).

Table 5: Estimated Long-Run Coefficients ARDL (1, 1, 0, 1):R-BAR Squared Criterion

Dependent variable is GDPG

Regressors	Coefficient	Standard Error	T-Ratio	[Prob.]
DEXP	0.71485	.26857	2.6617	[.013]
FD	-0.43568	.20790	-2.0956	[.045]
IP	-0.23185	.31969	-.72523	[.474]
C	5.0440	2.1547	2.3409	[.027]

Table 5 shows the long-run coefficients of the estimated ARDL model for the variables in the analysis. The coefficient of FD is -0.44 which is negative and statistically significant. The results indicate that one percent decrease of fiscal deficit increase growth rate 0.44 percent. In the long run increasing fiscal deficit lessens national savings and hinders the speed of economic growth. The conclusion of the study exposes that fiscal deficit is not a problem up to some threshold level. The coefficient of DEXP is 0.71 which is positive and significant. The results indicate that one percent increase of development expenditure increase growth rate 0.71 percent. It shows a positive and significant impact on the economic growth. The study can conclude that DEXP has significant impact on economic growth. Interest payments have an insignificant and negative coefficient -0.23. Intercept (C) is significant at 5% level of significance.

Table 6: Error Correction Results ARDL (1, 1, 0, 1):R-BAR Squared Criterion

Dependent variable is d(GDPG)

Regressors	**Coefficient**	**Standard Error**	**T-Ratio**	**[Prob.]**
dDEXP	1.2529	.42464	2.9506	[.006]
dFD	-.50807	.24538	-2.0706	[.047]
dIP	-.97867	.45538	-2.1491	[.040]
ecm(-1)	-1.1662	.15393	-7.5758	[.000]

Table 6 shows that all coefficients of differenced variables are significant at one or five percent level. The lagged value of the error correction term is negative and significant. It is showing convergence from short-run disequilibrium towards the long-run equilibrium by approximately 117 % in a year. So, a short-run relationship exists among variables of this model.

Table7: Results of Diagnostic Tests

	LM version	**P-value**
A-Serial Correlation (χ^2)	.035595	.850
B-Functional Form (χ^2)	1.10041	.294
C-Normality (χ^2)	.47883	.787
D-Heteroscedasticity (χ^2)	1.0842	.298

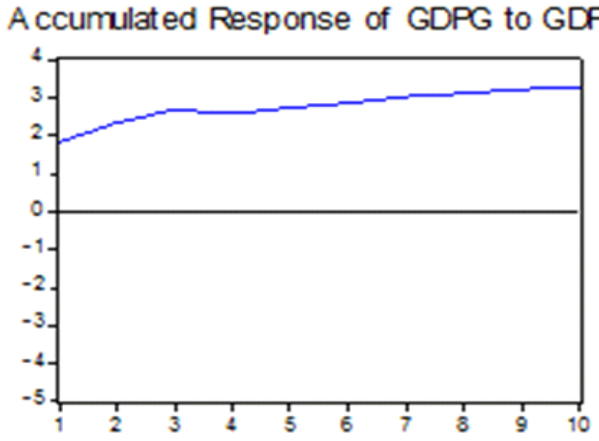
The study uses Breusch-Godfrey serial correlation test for detection of serial correlation in the ARDL model. Breusch-Pagan heteroscedasticity test is used to detect the problem of heteroscedasticity. Ramsey RESET test is used to ensure the specification of model. Jarque-Bera test is used to check the normality of residual of the model. Results of table (7) show that p-values of serial correlation test, functional form test, normality test and heteroscedasticity test are greater than 0.10, so there is no problem of serial correlation, normality, functional form and heteroscedasticity in the model. CUSUM and CUSUMsq do not exceed the critical

boundaries at 5% level of significance. So, the growth nexus model is correctly specified and long-run parameters are valid.

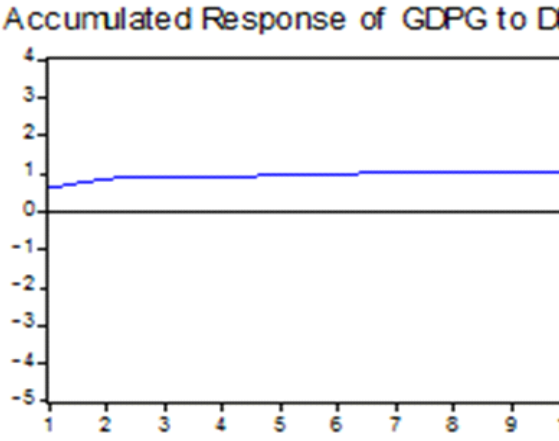
4.1 IMPULSE RESPONSE FUNCTION

Fiscal deficit and interest payments has negative impact on economic growth rate. The impulse response function shows that increase in total development expenditures has positive impact on economic growth rate. (Figure F1 to F16)

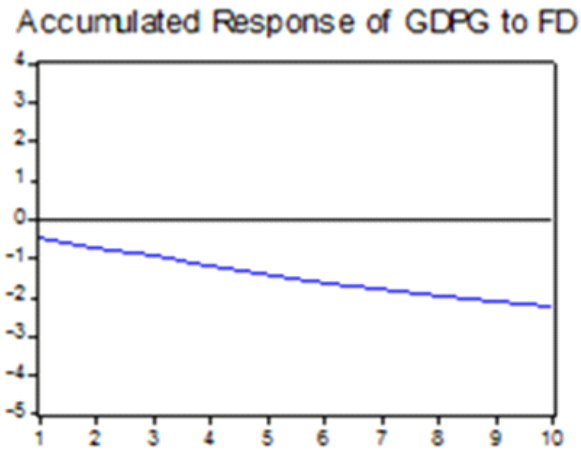
Figure1-16: Fiscal Deficit and Economic Growth Nexus: Accumulated Response to Generalized One S.D. Innovations



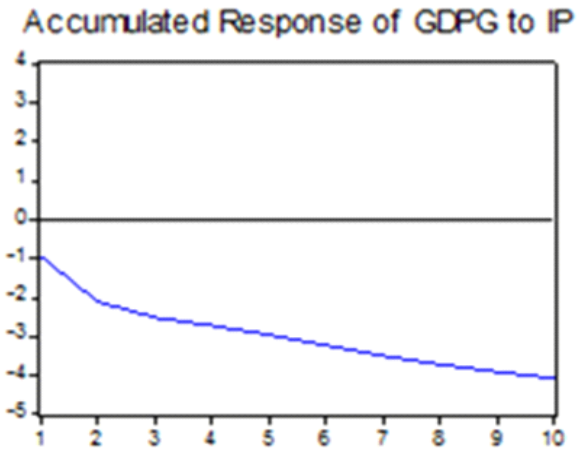
F 1



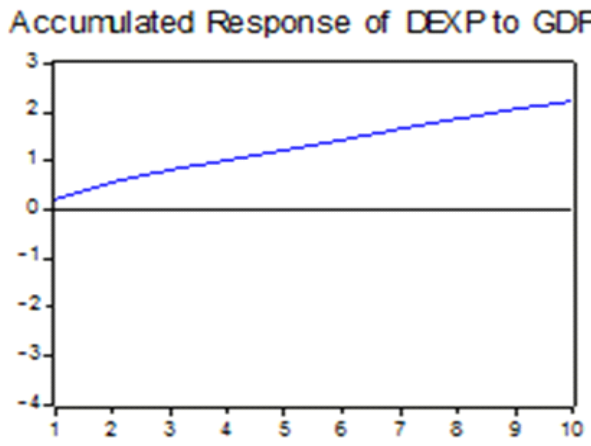
F 2



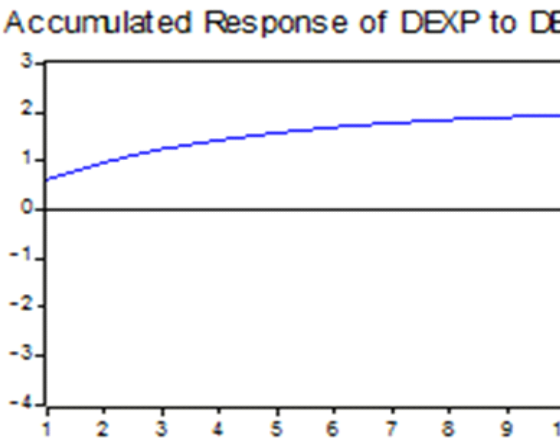
F 3



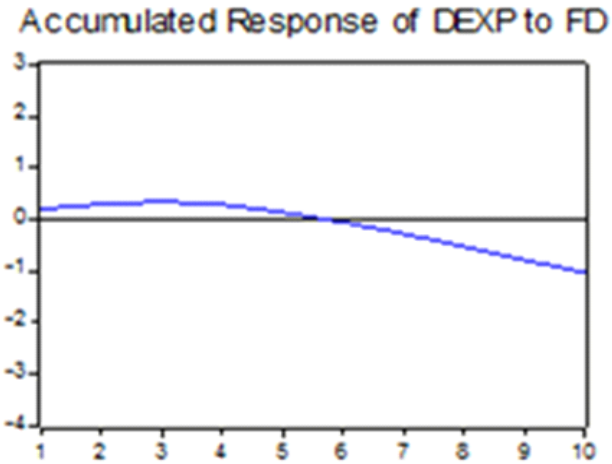
F 4



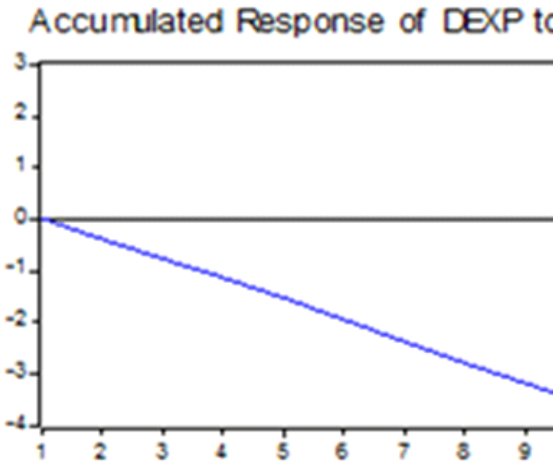
F 5



F 6

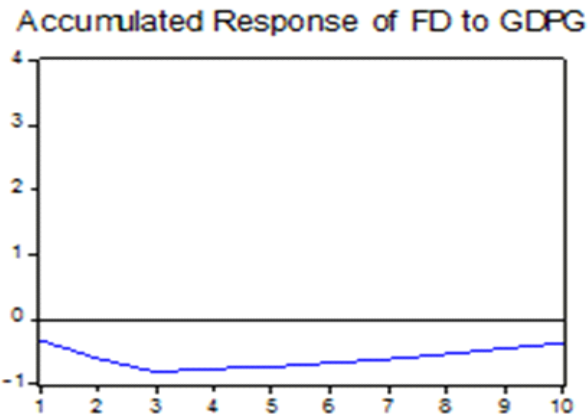


F 7

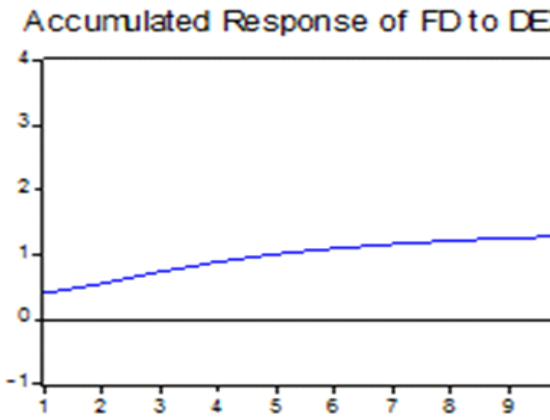


F 8

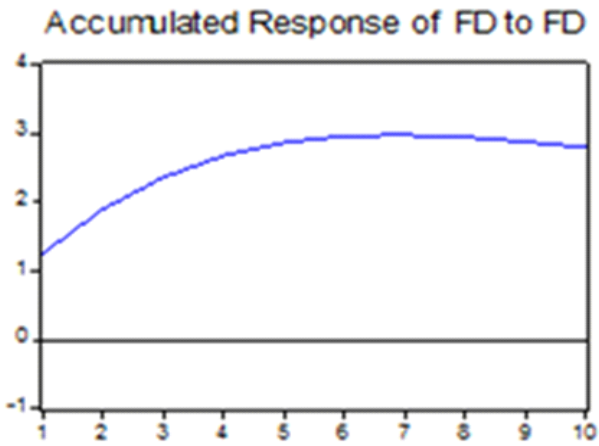
Accumulated Response to Generalized One S.D. Innovations ±2S.E.



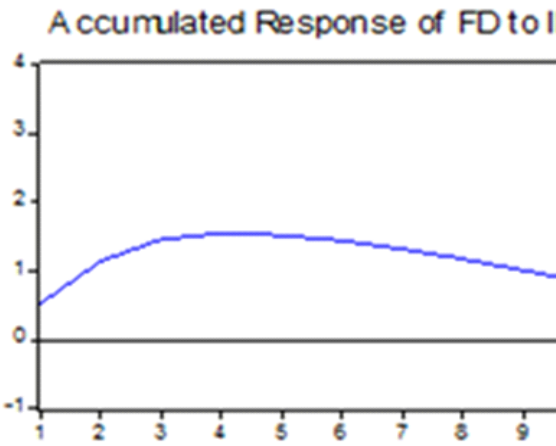
F 9



F 10

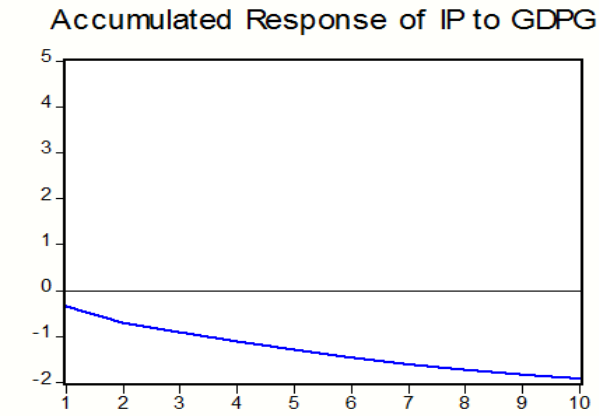


F 11

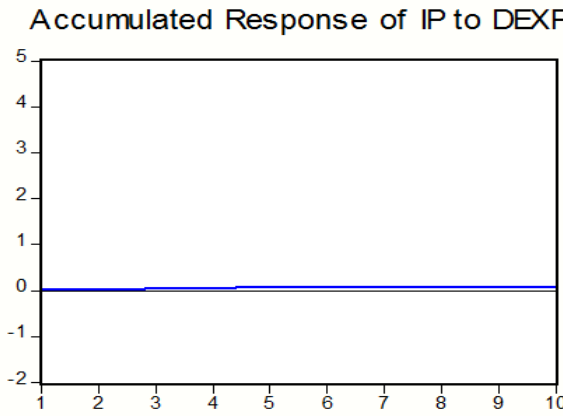


F 12

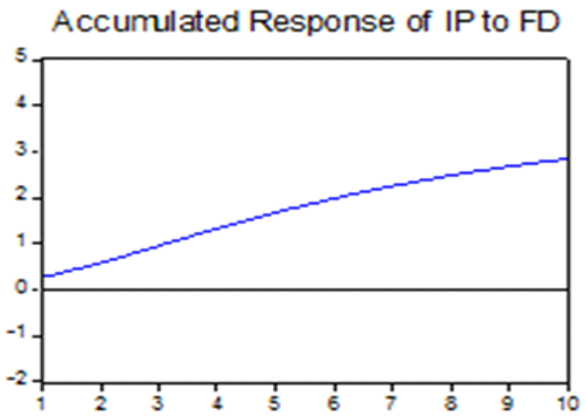
Accumulated Response to Generalized One S.D. Innovations ±2S.E.



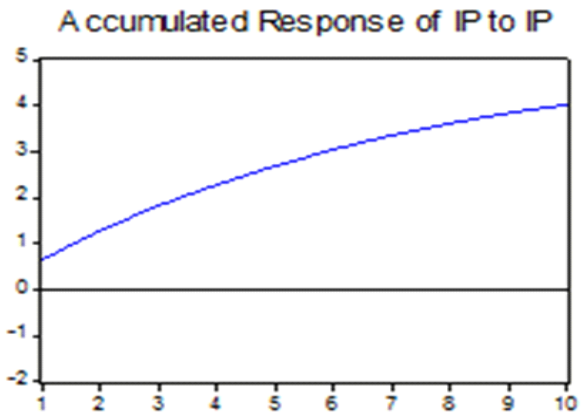
F 13



F 14



F 15



F 16

4.2 VARIANCE DECOMPOSITION

This section presents an analysis of the link between interest payments, budget deficit, development expenditures and economic growth in case study of Pakistan. Through variance decomposition technique, the variation in output level is determined through variation in independent variables. It is quite evident that fiscal deficit influences economic growth both directly and indirectly, The huge fiscal deficit and interest payments negatively affects economic growth rate. The

results demonstrate that development expenditures clearly explain increase in economic growth rate as compared to other variables. Our findings are consistent to outcomes of Christiane Nickel (2013), see Table 8, 9 and 10**..**In Pakistan, huge fiscal deficit leads to fall in economic growth rate. The study hints a reduction in the subsidies and funds attained should be capitalized in developmental and gainful ventures of health, education and infrastructure sectors etc.

Table 8: Variance Decomposition of GDPG

Period	**S.E.**	**GDPG**	**DEXP**	**FD**	**IP**
1	1.827193	100.0000	0.000000	0.000000	0.000000
2	2.198702	74.36361	0.133249	0.819007	24.68414
3	2.242501	73.87518	0.276000	0.841758	25.00706
4	2.291417	70.97398	0.329127	3.608476	25.08841
5	2.308977	70.41427	0.343192	4.249649	24.99289
6	2.331192	69.35785	0.337045	4.913275	25.39183
7	2.347325	68.84921	0.345541	5.190989	25.61426
8	2.360148	68.26669	0.344878	5.546460	25.84197
9	2.369377	67.89057	0.349877	5.805121	25.95443
10	2.376892	67.56405	0.352136	6.034492	26.04932

Table9:Variance Decomposition of DEXP:					
Period	**S.E.**	**GDPG**	**DEXP**	**FD**	**IP**

1	0.628263	11.45658	88.54342	0.000000	0.000000
2	0.848744	23.40798	56.68157	1.259263	18.65119
3	0.983217	24.57417	46.37292	1.144807	27.90810
4	1.072263	23.91209	40.37674	1.518234	34.19293
5	1.155969	23.68538	35.21404	2.847698	38.25289
6	1.241949	23.64079	30.62436	4.657022	41.07783
7	1.323926	23.57866	26.96357	6.566609	42.89116
8	1.397219	23.38426	24.20910	8.468023	43.93862
9	1.460317	23.14956	22.17080	10.22106	44.45858
10	1.513432	22.92451	20.66055	11.74371	44.67122

Table10: Variance Decomposition of FD:					
Period	**S.E.**	**GDPG**	**DEXP**	**FD**	**IP**
1	1.245903	6.830619	18.93974	74.22964	0.000000
2	1.460226	8.734693	16.96068	67.82284	6.481782
3	1.539466	9.677258	18.31952	65.72098	6.282246
4	1.578814	9.297163	18.24722	66.46850	5.987116
5	1.595688	9.131938	18.43939	66.17753	6.251146
6	1.604547	9.189086	18.41919	65.78797	6.603749
7	1.611499	9.230243	18.36333	65.22479	7.181641
8	1.619286	9.382265	18.21497	64.62965	7.773119
9	1.628522	9.527597	18.01803	64.03678	8.417590
10	1.638101	9.687132	17.80855	63.50541	8.998913

5. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has made an attempt to explore the association between fiscal variables and economic growth in Pakistan. The coefficient of FD is -0.44 which is negative and statistically significant. In the long run increasing fiscal deficit lessens national savings and hinders the speed of economic growth. The conclusion of the study exposes that fiscal deficit is not a problem up to some threshold level. Our results suggest that there exists nonlinear association between fiscal deficit and growth and reduction in fiscal deficit beyond a certain level may be growth-enhancing. However, given the current levels and structure of revenues, taxation, expenditures, and fiscal deficit, our results do not show that fiscal consolidation would enhance growth.

The coefficient of DEXP is 0.71 which is positive and significant. It shows a positive and significant impact on the economic growth. The study can conclude that DEXP has significant impact on economic growth. Intercept (C) is significant at 5% level of significance. Development expenditures have externality effects and also have higher multiplier effect but they should not come at the cost of crowding out of private investment. The share of capital expenditure has been declining despite persistent budget deficit, which may be one of the reasons why capital spending is insignificantly associated with growth. It shows that capital expenditures incurred in the past have not been very productive. At the current level, capital spending is not contributing to growth in a significant way. There is a need to boost capital spending in those areas that are highly productive and efficient.

What has been hurting Pakistan is high share of interest payment, in the government's financial commitments? Even though it is extremely difficult to curtail interest payments, government can reduce future interest payment obligations through prudent borrowing.

Interest payments have a significant coefficient in short run. One of the important conclusions drawn from the analysis is the negative correlation between growth and interest payments. Negative correlation is also found between primary deficit and growth, which strengthens the result that we need to reduce our primary deficit to boost growth. Primary deficit combined with higher interest payment will be harmful to the economy and therefore it is extremely important to curtail both the interest payments and the primary deficit.

This study has made clear some collective mix-ups and rejected the conservative opinions against effective role of fiscal policy. These concerns have the paramount significance for Pakistan and for developing economies as well. The economists of the South developed Keynesian/Structuralism approach, which does not follow a one-type approach, fit for all. A substantial fiscal deficit that converts the long-run steady state effects of fiscal policy on growth does not lead to inflation, because there are explanations to trust that the aggregate demand may itself impact the supply-side of the economy, particularly when developmental expenditures consist of infrastructure, energy and roads. Pakistan needs to rectify its fiscal policy bias in light of results of the study. The current view is not entirely correct, which demoralizes the effectiveness of discretionary fiscal policy in motivating economic activity in developing countries.

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APPENDIX-A

Definition of the variables

FD = Fiscal deficit
(Difference between revenues and expenditures excluding development expenditures)
DEXP = Development expenditures (part of budget for development projects)
IP = Interest payments of public debt
GDPG (Economic Growth) = Growth rate in Real Gross Domestic Product

Data Source
WDI, SBP, Economic Survey (various issues)