

Economic Growth, Public Debt, and Budget Deficit Dynamics in Pakistan: Evidence from an ARDL Approach

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Abstract

The current study has unfolded the relationship of economic growth, internal debt, external debt and budget deficit of Pakistan. ARDL methodology was applied to annual time series from 1980 to 2018; Bound test gauged the long run relationship among economic growth, internal debt, external debt and budget deficit of Pakistan. Results reveal the presence of long run association of economic growth, internal debt and external debt of Pakistan at 5% level of significance. Consequently, economic growth and budget deficit have significant long run association at 8% level of significance. Significant positive influence found in long run external debt, whereas negative impacts in short run on budget deficit. However, internal debt exhibits negative significant influence on budget deficit.

Keywords: Economic Growth, Internal Debt, External Debt, Budget Deficit, ARDL.

1. Introduction

Budget is a useful tool to set policies for developmental project in a country. Budget is an assessment about any country's spending and earning. But national budget is a planning about confirmation of actual expenditures. The budget may result in a deficit, a surplus, or a balanced position. Budget deficit is a situation when earnings are less than expenditure (Fatima et al., 2012). Usually, government earnings are due to taxation. Budget deficit is the excess of government spending over revenues. The reason for the increase in budget deficits is the increase in public expenditure for social programs and government intervention to economic activities (Al-Qudan, 2018). The government generates more revenues from imposing taxes on households' expenditures such as imported luxuries and services that create more deficit instead of a reduction (Tung, 2018). Qehaja and Driton (2018) concluded that the reason of budget deficit is that the government based on public debt, especially domestic debt that government take to finance the deficit and in return the country pays a large amount of interest rate that harms economic growth of a country.

In developing countries, a large deficit in budget is a common feature such as Pakistan. The economic outcomes of deficits are devaluation, inflation, faster growing

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GDP and Fiscal adjustment that are important for living standard and economic agenda. Deficits are due to government's high expenditure that causes a rise in public spending more than public revenues. To reduce the deficit, the government generates more revenues from imposing taxes on household expenditures such as imported luxuries and services, using loans and grants, and printing of money (Tung 2018).

Ricardian's believed there is no link among economic growth and budget deficit. Barro (1989) argued that when the government starts to borrow from individuals or firm, old generation realized that their future generations will be made worse off, so old generation pays extra taxes that are due in future. Each generation consumes exactly the same amount before government borrowing, so that taxes and debt financing are equivalent.

Classical economists believed that there is always a balanced budget; they are not in favor of surplus or deficits, due to their views of closed economy. Neoclassical models about debt stress the fact that when the government starts a project, they finance it by taxes or borrowing. If government financed a project by taxes, then resources come from private consumption and if government financed a project by borrowing from individuals or firms, then it affects private investment. Neo-classical believed that increase in budget deficit decreases personal consumption of (goods and services) and investment and the rate of interest increases, taxes and borrowing increase; this is the crowding-out effect. Classical economist believed that due to increase in government or private current consumption both investment and saving decreases, and in return, rate of interest increases, this is called crowding-out. According to neo-classical, only in the short run the budget deficit has a crowding-in effect, because the burden of taxes is shifted to the future generation. The views of Keynesians about budget deficit and economic growth are positive, they believed in a positive relationship among budget deficits and economic growth. According to Keynes budget deficit is a result of government spending, due to a rise in government's spending, private investment increases and in return demand for goods and services increases then investors produce more to fulfill demand and domestic production increases and this is a crowding-in effect. Keynes believed that investment and saving do not depend on the rate of interest, because investment depends on expected future profit. When government spending generates more investment, this is called crowding-in effect.

Due to government intervention towards social, political and economic activities, Pakistan faces budget deficit and economic problems such as high inflation rate, increase in population growth, unemployment, misuses of public expenditures and debt, expansion of fiscal policy and increase in cost of projects held by government sector. Previous studies about budget deficit used different models and techniques to determine budget deficit's impact on macroeconomic variables for different countries. The present study extends the previous studies to:

Investigate the relationship of budget deficit, economic growth, external debt and internal debt of Pakistan.

2. Literature Review

Budget deficit, economic growth and debts whether external or internal are very crucial for Pakistan. A country with continuous deficit budgetary conditions could not survive a long and healthy economic life. Nwanna and Nkiruka (2019) study how to finance deficit of Nigerian economy from 1981 to 2016. Domestic debt, external debt, GDP and debt services are key variables. OLS Method is used for this study. The results show a positive long run link among variables. (Tung, 2018) investigated fiscal deficit effect on economic growth for Vietnam from 2003 to 2016. Main variables are GDP, export, fiscal deficit, FDI, and investment.

Al-Qudan and Jaradat (2018) investigated the influence of external debt and economic growth on Jordan budget deficit from 1993 to 2017. They used ARDL model in the study. The results showed external debt and deficit budget are associated positively while economic growth and budget deficit are negatively associated. According to Qehaja and Drriton (2018) in long run public debt increases due to budget deficit. They used Ordinary Least Square method for Kosovo from 2010 to 2018. The regression results showed positive relationship among public debt (domestic and international) and budget deficit.

Epaphra M, (2017) analyzed the link between macroeconomic fundamentals and deficit budget for Tanzania from 1966-2015. Study variables were exchange rate, GDP, inflation, interest rate and money supply. VAR-ECM approach was used in this study. The results showed that GDP has a negative but significant relationship with budget deficit. (Saima & Uddin 2017) studied the public debt relationship with budget deficit for Bangladesh from 1995 to 2015. Johansen co-integration technique was used to see the long run relationship between variables. The co-integration results proved the long run relation between public debt and budget deficit.

(Ahmed Fahminda & Rahman Benazir 2017) examined the relationship between economic growth and budget deficit from 1999 to 2015 for Bangladesh. Research variables were GDP, domestic debt, deficit overall, GNI, domestic saving, exchange rate, investment and domestic financing. Multiple regression was used for this study. Results revealed that GDP, Investment, saving, exchange rate, domestic financing, domestic debt, GNI and investment have a positive and significant relationship with budget deficit. (Zoto & MSC, 2016) studied budget deficit impact on economic growth for Albania from 1993 to 2014. They used GDP, FDI and budget deficit. ARCH model was used in this study. The results showed long run relation between FDI, budget deficit and economic growth.

Binh and Hong, (2016) examined economic growth relation with budget deficit for Vietnam by using 2003 to 2012 data. Study variables were budget deficit, productive expenditure, non-productive expenditure and economic growth. The ARDL were used in the study. Two models were used in the study one is in log form and other in non-log form. The results of non-log model showed insignificant and negative long run relation between budget deficit and economic growth. The log form model showed insignificant but positive relationship between economic growth and budget deficit

Neelma et al., (2016) investigated budget deficit and government debt relation in Pakistan from 1978 to 2013 by using Simultaneous equations. In the first equation, private consumption is the response variable and wealth, government debt, disposable income and tax revenues are explanatory variables. In the second equation, private saving is the main variable and budget deficit, tax revenue and disposable income are explanatory variables. The regression results shown that in model 1 private consumption and tax revenues are negative and wealth, government debt and disposable income is positive with private consumption. And in model 2 private saving and government debt are negatively related and budget deficit, tax revenues and disposable income are positively connected with private saving.

Aslam (2016) in the context of Sri Lanka studied the relationship between economic growth and budget deficit from 1959 to 2013. Study variables are GDP, export earnings, budget deficit, exchange rate and inflation. In this study ADF test was used for order of integration, Johansen co-integration technique was applied for examining the long run association. The Johansen co-integration results found long run relationship between GDP, export earnings, budget deficit, exchange rate and inflation. The short run model revealed negative relation among economic growth and budget deficit. The results also showed that the coefficients of budget deficit and exports earnings are significant and positive with GDP.

Khan et al., (2016) examined relationship between external debt, GDP, exports and imports and budget deficit from 1999 to 2014. Bound test, LM test, Wald test, Granger causality and stability tests are used in the study. The results shown no long run relationship between variables. Fehiman (2015) for North Cyprus analyzed budget deficit and economic growth relation from 1983 to 2010. Main study variables are budget deficit, non-productive spending, GNP and productive spending. ADF unit root test, Granger Causality test, Bound co-integration and ARDL approach are used in this study. The Bound test results showed long run relation between budget deficit, non-productive spending, GNP and productive spending. The results of Granger causality showed that there is insignificant bivariate causality between budget deficit and GDP and significant and positive bivariate causality between productive and non-productive spending. The overall study results shown significant positive association between budget deficit and economic growth.

Humera, (2015) studied economic growth relation with budget deficit for Pakistan from 1976 to 2007. Study variables are GDP, fiscal deficit and labor and investment. Co-integration, Granger Causality tests, VECM and VAR model are used in study. The Granger causality results shown no causality between GDP and fiscal deficit because of unsuitability of budget deficit. The result of co-integration shown that budget deficit, investment and labor are not co-integrated with GDP.

Shahateet et al., (2014) studied external debt impact on budget deficit for Jordan from 1992 to 2012. Causality and co-integration tests are used for analysis. The results of co-integration shown no long run relationship between budget deficit and external debt and Granger causality indicated no causality between budget deficit and external debt. Ayesha and Khalid (2013), studied macroeconomic factors that

affect Pakistan's budget deficit from 1980 to 2011. Main variables are budget deficit, bank credit, FDI, CPI, exchange rate and GDP. ADF, Johansen co-integration and diagnostic tests were applied in the study. Co-integration test results shown significant and positive long run relationship between GDP, exchange rate, FDI, bank credit and budget deficit but negative relationship of inflation with budget deficit. Folorunso and Falade (2013) examined the relationship between public debt and fiscal deficit in Nigeria from 1970 to 2011. ADF, Granger Causality, pairwise correlations and Johansen co-integration tests were used in this study. The results of Granger causality showed bi-directional link between fiscal deficit and public debt. Johansen co-integration showed significant relationship between variables and Granger Causality test shows bi-directional relationship among public debt, domestic debt and total debt with fiscal deficit and uni-directional causality between external debt and fiscal deficit. ECT shows positive and significant relationship between public debt and fiscal deficit for both short run plus long run.

Najid, (2013), explored the budget deficit role in economic growth of Pakistan during the period of 1971-2007. GDP, FDI and budget deficit are the variables in the study. OLS Method and Granger Causality are used for analysis of the data. The results of Granger Causality show that there is uni-directional relation between GDP and FDI, bi-directional causality between budget deficit and GDP and no causality between FDI and budget deficit. The result of regression shows significant and positive relationship between economic growth and Foreign Direct Investment. However, there is an insignificant and positive relationship between budget deficit and economic growth of Pakistan.

A similar study has been conducted for the period of 1978-2009 in Pakistan by (Fatima et al., 2012). In this study ADF is used for testing stationarity and OLS is applied for exploratory analysis. The results of study show that inflation and budget deficit is negatively related with economic growth. The reason of negative relation is government limited resources and less savings for revenues. To control deficits, printing money is no solution because printing money causes the inflation rate to increase in the economy. Government should make tax reforms which generate more revenues to control budget deficits and suitable policies should be adopted to collect taxes from rich to generate more revenues.

Rahman (2012) in the case of Malaysia from 2000-2011 investigated budget deficit link with economic growth. ARDL approach was used for long run relationship among budget deficit, productive expenditure, GDP and non-productive expenditures. The result of co-integration proves the long run relationship among GDP, productive expenditures, budget deficit and non-productive expenditures. The coefficient of both expenditures productive plus non-productive expenditures are statistically significant and positive with GDP but budget deficit is insignificant and positive with GDP. ECM shows that coefficient is insignificant but positive and economy can move towards equilibrium with the speed of convergence and this convergence helps to change productive expenditure and growth level of GDP and there is no role of budget deficit to equal growth level in the economy. (Muhammad et al., 2012), studied Debt-burden

impacts and remedies for the future for Pakistan from 1989 to 2010. Two models were used in their study. Main study variables of model 1 are GDP, external debt, inflation, exports, population and government deficit, saving, external debt, and liabilities and domestic debt. In model 2 main variables are Manufacturing sector, external debt and liabilities, debt servicing, export, population, unemployment, saving, literacy rate, money supply and trade openness. Ordinary Least Squares Method was used in this study. Model 1 results show that external debt of Pakistan is significant and positive with economic growth and model 2 shows that external debt and GDP are significant and weak but domestic debt of Pakistan is negative with unemployment.

3. Methodology

The purpose of the study is the investigation of the relationship among economic growth, internal debt, external debt and budget deficit of Pakistan from 1980 to 2018. This study originates issues that influence economic growth, external debt, internal debt and budget deficit. The econometric techniques and statistical tools are applied for the investigation for relationship among variables. The chapter consists of the details of data collection, variables, methods and procedures that are used in the study.

3.1. Data

The annual time series data of the current study is collected from 1980 to 2018. Economic Growth and External Debt data are collected from the World Development Indicators (WDI), while data of Budget Deficits and internal debt data are collected from State Bank of Pakistan (SBP).

Table 3.1: *Variable Description*

S. No.	Variables	Code	Unit	Source
1	Log Budget Deficit	LNBD	Rs Millions	SBP
2	Economic Growth	GRn	Percentage	WDI
3	Log External Debt	LNED	Rs Millions	WDI
4	Log Internal Debt	LNID	Rs Millions	SBP

3.2. Study Variables Definitions

Dependent Variable

Budget Deficit: Budget deficit is difference of government expenditures and revenues

Independent Variables

Economic Growth: Over-time increase in production level and economic growth that is measured as percentage nominal GDP growth rate of Pakistan.

External Debt: External debt stock total that the government borrows from external sources including Consortium, Non-Consortium, Islamic Countries and IMF Trust Fund.

Internal Debt: Debt from domestic sources including floating debt, permanent debt, unfunded debt and instruments of foreign currency.

3.3. ARDL Methodology

For the investigation of the budget deficit effect on macroeconomic variables, previous studies empirically used different econometric techniques and models. Such as the ADF test for unit root, Phillips-Perron test, the Granger Causality, Co-integration test, VECM, Multiple Linear Regression, Vector Autoregressive Model and Autoregressive Distributed Lag Model Approach are used and find different results for different countries. ARDL approach can be used only if variables are stationary with the mixture of level and first difference I (1).

ARDL approach can be used only if variables are stationary with the mixture of level and first difference I(1). The ARDL procedure of the (Pesaran & Pesaran 1997), (Shin & Pesaran 1995,1998) and (Pesaran et al., 2001) can be used only if time series variables are mixture of first difference and level and it cannot be used if the time series variables are in second difference. The co-integration procedure of (Johansen, 1991), (Engle & Granger 1987) and (Granger, 1981) can be applied only if time series variables' first difference is stationary, second difference or level. Before testing the model, we briefly discussed ARDL bound co-integration testing method developed by (Pesaran et al., 2001) for estimating the time series data. This ARDL bound approach of (Pesaran et al., 2001) are used only if these properties are fulfilled:

1. ARDL model does not need same integration level of variables. All variables unit root test should be at the first difference and level, and variable should not be at second difference. If variables are I (2) then we cannot use ARDL bound co-integration model developed by (Pesaran et al., 2001).
2. In time series data for small sample size ARDL model is more efficient for estimation and interpretation.
3. The bound test prepared by Pesaran et. al. (2001) suggest that the value of F-statistic decide the long run relationship exist or not. The F-statistic value is compared with the upper bound and the lower bound value at 5% level. If F-statistic value is greater than upper bound value then we reject the null hypothesis $H_0: \delta_0=\delta_1=\delta_2=\delta_3=0$ that there is no relationship and accept the alternative hypothesis $H_1: \delta_0\neq\delta_1\neq\delta_2\neq\delta_3\neq0$ that there is a long run relationship. If the *F-statistic* is less from lower bound value then its mean there is no relationship in long run. If the *F-statistic* lies between 5% upper and the lower bound value, then the results of the Bound test are inconclusive.
4. To empirically investigate the dynamic interaction with respect to long run and short run relationship among the variables (*Economic Growth, External Debt, Internal Debt and Budget Deficit*), we apply ECM technique in ARDL Model.
5. In the case that the Bound test proves that there is a long-run relationship among variables, then we estimate the long run coefficients of variables.
6. Short run ECM model should be applied in ARDL model
7. There should be no serial correlation and for this test LM test is used to see autocorrelation.

8. Model should be stable, to check stability of the model the CUSUM and the CUSUMQ test is used developed by (Browne et al., 1975).

This study used Autoregressive Distributed Lag model to investigate the relationship between economic growth, internal debt, external debt and budget deficit in Pakistan from 1980 to 2018. The methodology of this study based on previous methodology, such as (Al-Qudan 2018), (Binh, 2016), (Eminer 2015), Khan Irfan, 2016) and (Rahman, 2012) that employ ARDL model in their studies.

3.4. Model Specification

The model that is used for the study includes Economic Growth, External Debt, Internal Debt and Budget Deficit.

The model is formulated as follows:

$$LNBD = f(GR_n, LNED, LNID) \text{ ----- } 1$$

The study used the ARDL model as:

$$\Delta LNBD_t = \alpha_0 + \sum_{i=1}^p \beta_1 \Delta LNBD_{t-i} + \sum_{i=0}^{q1} \beta_2 \Delta GR_{t-i} + \sum_{i=0}^{q2} \beta_3 \Delta LNED_{t-i} + \sum_{i=0}^{q3} \beta_4 \Delta LNID_{t-i} + \gamma_1 GR_{t-1} + \gamma_2 LNBD_{t-1} + \gamma_3 LNED_{t-1} + \gamma_4 LNID_{t-1} + \epsilon_t$$

Where Δ represent difference operator to account for stationarity. LNBD is natural log of budget deficit, GR_n is economic growth, LNED is natural log of external debt, and LNID is natural log of internal debt, α_0 is intercept, β_1 , β_2 , β_3 and β_4 are Short-run coefficients for each variable. γ_1 , γ_2 , γ_3 and γ_4 are Long-run coefficients for each variable, t time period and ϵ is error term. Where p , q_1 , q_2 , q_3 are Lags of the variables chosen based on criteria like AIC or SIC.

4. Results

Descriptive

Table (4.1) explains the important features of all the variables used in this research. P-value of Jarque-Bera test reveals that all the variables are normally distributed. Jarque-Bera of economic growth (GDP) 0.319493, external debt (LNED) 2.227392 and internal debt (LNID) 1.394943 with p-values greater than 5%, which shows that the data is normally distributed and could be used to predict Pakistan budget deficit. Internal debt (LNID) has maximum value 16.67975 against external debt (LNED) 16.22072 and economic growth (GDP) 10.21570. External debt (LNED) has the lowest standard deviation (1.371117) as compared with internal debt (LNID) 1.624721 and economic growth (GDP) 2.072609. Median values of external debt (LNED) and internal debt (LNID) are greater than mean values. Kurtosis of economic growth (GDP), external debt (LNED) and internal debt (LNID) is less than 3.

Table: 4.1: Descriptive Statistics

	LNBD	GR _n	LNED	LNID
Mean	10.57520	4.913290	14.02860	13.97319
Median	11.23945	4.846581	14.34030	14.14668
Maximum	13.6537	10.21570	16.22072	16.67975

Minimum	6.501740	1.014396	11.49597	10.98741
Std. Dev	2.179840	2.072609	1.371117	1.624721
Skewness	-0.514320	0.183227	-0.253898	-0.112169
Kurtosis	1.916213	2.750255	1.945085	2.101057
Jarque-Bera	3.628126	0.319493	2.227392	1.394943
Probability	0.162991	0.852360	0.328343	0.497843
Sum	412.4329	191.6183	547.1153	544.9544
Sum Sq. Dev.	180.5648	163.2369	71.43859	100.3093
Observations	39	39	39	39

Source: Author's Estimation in E-Views 9

4.1. Unit Root Tests

ARDL model can be used if the time series variables are integrated with level and first difference. ADF unit root test and Phillips-Perron test are used to check the stationarity of Budget deficits (LNBD), economic growth (GRn), external debt (LNED) and internal debt (LNID) of Pakistan. From table (4.2.1) and table (4.2.2) the budget deficit is stationary at the first difference I(1), economic growth is stationary at the level I(0), external debt and internal debt are stationary at the first difference I(1). Time series variables are mixture of I (1) and I (0) now we can apply ARDL model for the investigation of relationship among external debt, internal debt, economic growth and budget deficit of Pakistan.

Table: 4.2.1: ADF's Units Root Test

Variable	At Levels		At 1 st Difference			Integ. Order
	Drift	Trend and drift	Drift	Trend and drift		
LNBD	0.4349	0.6955	0.0000	0.0001		I(1)
GRn	0.0043	0.0242	0.0000	0.0000		I(0)
LNED	0.6960	0.1663	0.0056	0.0191		I(1)
LNID	0.2741	0.1699	0.0002	0.0005		I(1)

Estimation in E-Views 9

Table: 4.2.2: Philips Peron Test

Variables	At Level		At 1 st Difference			Integ. Order
	Drift	Trend and drift	Drift	Trend and drift		
LNBD	0.4349	0.6963	0.0000	0.0000		I(1)
GRn	0.0048	0.0251	0.0000	0.0000		I(0)
LNED	0.5368	0.6236	0.0049	0.0159		I(1)
LNID	0.7597	0.6048	0.0001	0.0002		I(1)

Estimation in E-Views 9

4.2. Lag Length Criterion

Bayesian (*SIC*) information criterion is appropriate for small sample size to select the number of lags in the model. Lag selection criterion which includes *LR*, *FPE*, *SIC* and *HQ* indicated that inclusion of single lag in the model is best as compared with the other model. AIC criterion is the only criterion among entrants that suggests 3 lags are appropriate to best fit the model. However, keeping in mind the number of observations and variables to be included we choose only one lag of autoregressive and distributed lags in the model.

Table: 4.3: Lag Length Criterion

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-173.6759	NA	0.227508	9.870883	10.04683	9.932293
1	-5.369267	289.8614*	4.85e-05*	1.409404	2.289136*	1.716454*
2	9.301798	22.00660	5.41e-05	1.483233	3.066752	2.035924
3	27.67871	23.48160	5.20e-05	1.351183*	3.638488	2.149514

Source: Author's Estimation in E-Views 9

4.3. ARDL Bound Test

After selecting ARDL (3, 1, 1, and 1) model the next step is to check the long run relationship between variables. ARDL Bound test is used to check the long run relationship between variables. For the investigation of the long run relationship among study variables, we compare F-Statistic value with the upper bound and the lower bound value at 5%. From Table 4.4 the F-Statistic value is 5.666556 which is more than upper bound 3.23 and lower bound critical 4.35 at 5%, so we reject the null hypothesis that there is no long run relation and accept the alternative hypothesis that there is a long run relationship between variables. The results of the Bound test proved the existence of relationship between variables. The results of this test are similar to

Al-Qudan, (2018) for Jordan who found positive long run relationship. The results of this study differ from the findings of Irfan, (2016) for Pakistan who found no long run relationship.

Table: 4.4: ARDL Bound Test

Null Hypothesis: There is no Long-Run relationship between variables		
Test Statistic	Value	K
F-Statistic	5.666556	3
Critical Bound Value		
Significances	I(0) Bounds	I(1) Bounds
10.0%	2.721	3.772
5.0%	3.232	4.351
2.50%	3.691	4.892
1.0%	4.292	5.611

Estimation in E-Views 9

4.4. Long Run Coefficients

The bound test proved that the time series have co-integrated, then the long run coefficients relationship is estimated by using maximum 3 lags. The AIC selected ARDL (0, 0, 0, 0) model for estimation of the long run coefficients. Long run coefficients results are as follows.

Table: 4.5: Coefficients (Long Run)

Variables	Coefficients	Std. Error	t-Statistic	Prob.
GRn	0.614690	0.341909	1.797820	0.0838
LNED	10.726796	3.149934	3.405403	0.0022
LNID	-9.692335	2.548223	-3.503566	0.0008
Constant	5.009545	11.046284	-0.453505	0.6539

Estimation in E-Views 9

Table 4.5 shows that in long run the coefficient of economic growth (GRn) is (0.614690) and probability value is (0.0838) that is positive and significant with budget deficit at 8% level and shows that one percent increase in economic growth will increase budget deficit (0.61) percent and this is due to increase in government spending that increases budget deficit, when the government spends on developmental projects, it increases country's GDP and then there is no harm for economic growth. This finding is similar with, (Aslam, 2016), (Epaphra, 2017) and (Mushtaq, 2013) who found positive relationship between budget deficit and economic growth. Results are dissimilar with the findings of (Binh, 2016), (Najid, 2013) and (Rehman, 2012) who found no relation between budget deficit and economic growth. On the other hand Al-Qudan (2018), Saima, (2017), Nayab, (2015), Rahman, (2012), and Fatima, (2012) found negative relationship with economic growth and budget deficit.

The long run coefficient of external debt LNED (10.726796) and its probability value is (0.0022) which is significant and positive with budget deficit of Pakistan and shows that the one percent increase in the external debt will decrease the budget deficit (10.726796), the results are same with the findings of (Nwanna, 2019), (Al-Qudan, 2018), (Saima, 2017), (Folorunso, 2013) and (Bagheri, 2012) who found positive link budget deficit and external debt. This result differs from the findings of (Khan Irfan 2016) and (Shahateet, 2014) who found negative relationship among budget deficit and external debt. The long run coefficient of internal debt is (-9.692335) and probability value is (0.0008) which is significant but negative with budget deficit of Pakistan and shows that the one percent increase in internal debt will lead to decrease the budget deficit (-9.692335). The result of this test is against the findings of (Nwanna, 2019), (Saima, 2017), and (Folorunso, 2013) who found a positive long run relationship between internal debt and budget deficit.

4.5. ARDL Co-integration and Error Correction Results

The ECM estimation based on the estimation of long run coefficients. The automatically lag length is selected by SIC. According to SIC we found ARDL (3, 1, 1, and 1) model as a best equation. The co-integration equation coefficient which is called ECM (-1) or speed of adjustment in the direction of equilibrium. Coefficient of co-integration must significant. From *table (4.7)* the co-integration equation coefficient is significant and negative. The probability value is (0.0068) which are less than 5%. The low percentage of probability value indicates the existence of a long run causality running from economic growth (GRn), external debt (LNED) and internal debt (LNID) to budget deficit (LNBD). The co-integration equation coefficient (-0.491349) indicate that the whole system will move towards equilibrium with the speed of adjustment of 49 percent.

From *table (4.6)* in short run, budget deficit (*lag 1*) has insignificant and positive impact on budget deficit and budget deficit (*lag 2*) is negative but significant impact on budget deficit. This is due to government inability to play its political, social and economic role. Economic growth has an insignificant and positive impact on budget deficit this is because in Pakistan economic growth not grows at sufficient rate to fulfill country's budget deficit. The external debt has significant and positive with budget deficit. Internal debt is significant but negative with budget deficit, this is because government misuse its internal debt for unproductive ways.

Table: 4.6: ARDL Co-Integration and Short Run Results

Variable	Coefficient	Stand. Error	t-Statistics	Probs.
D (LNBD(-1))	0.088059	0.170498	0.516484	0.6099
D (LNBD(-2))	-0.409858	0.169993	-2.411027	0.0233
D (GRn)	0.043146	0.114363	0.377272	0.7090
D (LNED)	11.339991	3.148998	3.601142	0.0013

D (LNID)	-16.200378	3.750555	-4.319462	0.0002
CointEq (-1)	-0.491349	0.167138	-2.939778	0.0068
Cointeq= LNBD - (0.6147*GRn + 10.7268*LNED - 9.6923*LNID + 5.0095)				

Source: Author's Estimation in E-Views 9

4.6. Diagnostic Test

The diagnostic test in tables (4.7.1, 4.7.2, and 4.7.3) are used. For autocorrelation the LM test is used, for Heteroscedasticity the Breusch-Pagan-Godfrey test, for normality Jarque-Bera are used in this study. P-Values for these tests are more than 5% that shows no autocorrelation, no Heteroscedasticity and normality between residuals.

Table 4.7.1: Breusch-Godfrey Test

F-Stat	R sq	Prb. F (2, 24)	Prob. of Chi-Sq (2)
0.1862512	0.5502143	0.83134	0.75953

Source: Author's Estimation in E-Views 9

Table 4.7.2: Heteroscedasticity Test

F-Stat	R squared	Scl.d. Expl. SS	Prb. F(9, 26)	Prb. Chi-Sq(9)	Prb. Chi-Sq (9)
5.531485	23.64900	34.59619	0.6284	0.5620	0.4542

Estimation in E-Viws 9

Table 4.7.3: Normality Test

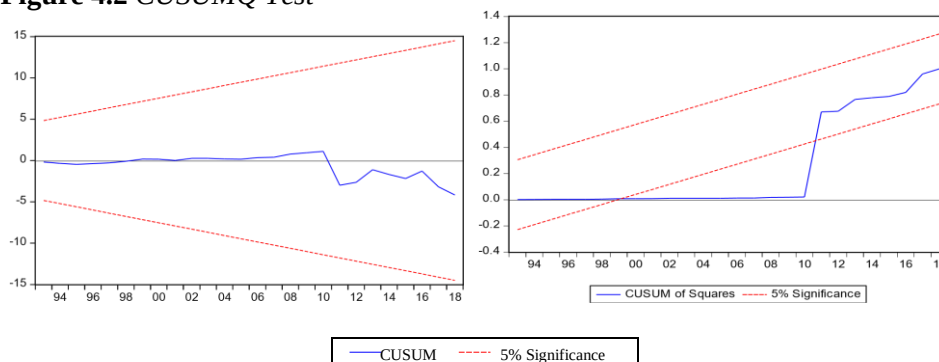
Jarque-Bera	Probability
2.244904	0.913663

Source: Author's Estimation in E-Views 9

4.7. CUSUM Test for Stability

For model stability, authors have employed CUSUM and CUSUM of Square (CUSUMSQ) in the study. The fluctuation of red line indicates the model stability. Additionally, to test the model stability the Cumulative Sum of Recursive Residuals CUSUM used. The Figure 4.1 is the graphical representation of results, which demonstrate that blue line is within the dotted red line. It indicates the model fitness as well as stability. Moreover, figure 4.2 is the graphical representation of Cumulative Sum of Square of Recursive Residual CUSUMQ. The CUSUMSQ results has revealed structural breaks and shocks from 1999 to 2011. The cause of structural breaks and shocks in budget deficit are the governmental instability with respect to political, social and economic roles in Pakistan.

Figure 4.2 CUSUMQ Test



5. Conclusion

The study has examined the relationship of economic growth (GR_n), external debt (LNED), internal debt (LNID) and budget deficit (LNBD) of Pakistan from (1980 to 2018). The study uses ADF and PP unit root test for stationarity, ARDL model, Bound test for long run relationship and co-integration (ECM) test to investigate the relationship among study variables. The study finds the following results:

1. ARDL bound test found that there is a long run relationship between external debt (LNED), internal 13 debt (LNID), economic growth (GR_n) and budget deficit (LNBD) of Pakistan.
2. The long run coefficient shows that economic growth (GR_n) is significant and positive with budget 15 deficit of Pakistan. The results are according to Keynesian school of thought that there is positive 16 link among economic growth and budget deficit.
3. Long run coefficient of external debt (LNED) is significant and positive with budget deficit of 18 Pakistan. Therefore, to reduce deficit government should reduce the amount of external debt to overcome the problem of high interest rate on foreign loans and based on more collection of tax revenues and use of loans on investment that generate more investment in order to reduce budget deficit (Al-Qudan, 2018).
4. Long run coefficient of internal debt (LNID) is significant and negative with budget deficit of Pakistan. This is due to misuse of internal debt on non-developmental projects that generate no investment to reduce the deficit in the country.
5. Co-integration equation ECM (-1) shows the existence of long run relationship among external debt (LNED), internal debt (LNID), economic growth (GR_n) and budget deficit (LNBD) of Pakistan.
6. The short run results shows that economic growth (GR_n) coefficient is insignificant but positive with budget deficit, which means that in Pakistan economic growth is not enough to finance budget deficit. External debt

(LNED) has significant and positive with budget deficit due to proper use of external debt on developmental projects and internal debt has significant and negative impact on budget deficit, this is due to misuse of internal debt on non-development sectors in short run.

6. Policy Recommendation

1. The overall finding of the study is that economic growth (GRn), external debt (LNED) is significant and positive with budget deficit, while internal debt (LNID) is significant but negative with budget deficit, so:
2. Government and policy makers should take steps to reduce budget deficit by increasing amount of tax revenues and decrease the amount of expenditures on non-developmental projects that generate no more investment.
3. Government should rely on internal borrowing rather than external borrowing, because on external borrowing government pays more interest rate that increase more deficit in a country.
4. Government should use loans on such investment that generate more income that should be used to reduce public budget deficit.

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