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Impact of Government Borrowing on Financial Development (A case study of Pakistan)

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Abstract
Private sector of any country plays important role in the economic development of the country. It not only provides employment to the people of the country but also goods and services according to the taste of the people. Private investment depends mainly on private borrowing which proves to be the blood for private sector. Private borrowing or credit to private sector is important part of the financial development which measures the financial depth of it. The aim of this paper therefore, is to investigate the impact of government borrowing from central bank and commercial banks on financial development. In this Paper, government borrowing is used as Public domestic debt while credit to private sector (Private borrowing) is used as financial development. Normally, it is frequently observed that when government borrows more from banks, then less amount left for the private borrowing so in this way volume of private investment declines and this is found in this study. There are some other factors which also affected the private borrowing like, taxes, savings and inflation. This study has been done by using time series data of Pakistan from 1972-2015. ARDL Methodology has been used to investigate the relationship of variables. The data resource has been taken from WDI and the reports of state bank of Pakistan as well as different issues of economic survey of Pakistan.
**Keywords**: Government Borrowing, Investment, Domestic Debt, Financial Development
JEL Codes: H74, E22, H63, G02

I. Introduction

During 1970 Financial development was considered as ratio of private credit to GDP (Gross domestic product) and ratio of stock market capitalization to GDP (Rajan and Zingales 1998). Financial development plays vital role in the economic growth of the country (Arcand, Berkes, and Panizza 2012). Ratio of private credit to GDP is used as financial development (Dabla and Srivisal 2013). Financial development is negatively affected by government borrowing (Ardagna et al. 2007, Fielding 2007, Sah and Stiglitz 1993). In past fiscal management of Pakistan was not appealing because of poorly managed tax system and improper performance of all the departments of Pakistan. Continuously rise in budget deficit put the pressure on the banking sector which is unable to provide credit to private sector for investment. Government borrowing greatly affected the financial development of Pakistan.

Figure 01: Revenue-Expenditure Gap (% of GDP)
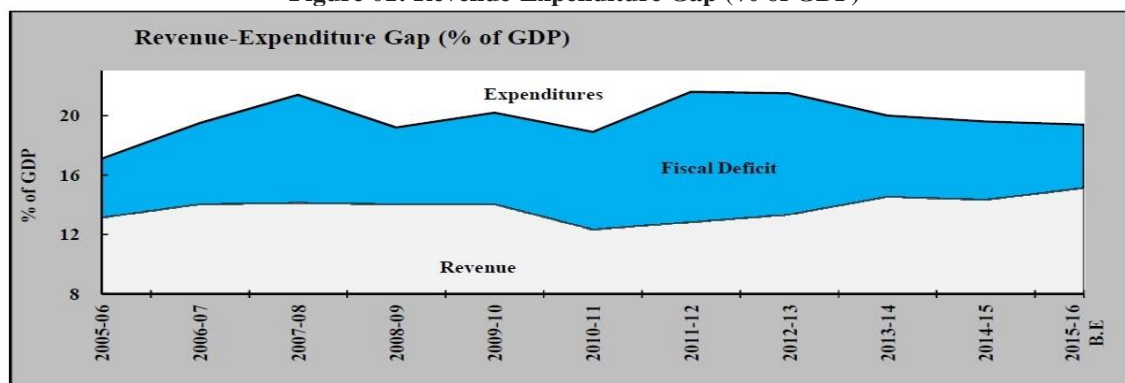
From the above graph, we can see that Fiscal deficit increased with more magnitude from 2011-2013. Government borrowing of Pakistan has been reached to Rs.567.5 billion in 2016 while this was Rs. 539.4 billion in previous year. Financial development consists of many aspects. With the passage of time, financial markets and sectors got massive importance. Development of financial sector is considered important for the economic growth of any country. Main

objectives of any country's monetary policy to control inflation, supply of money and has stable exchange rate system. This is also the objective of monetary policy to bring balance of payment at equilibrium. External sector of Pakistan has progressed extensively due to rise in foreign remittances, stability in exchange rate. State bank of Pakistan took bold steps in monetary policy and decreased the rate of interest at 5.75 percent which is lowest rate in last forty-four years. During last 10 years, credit to private sector has been increased dramatically and it reached to Rs. 311.7 billion in 2016 which was Rs. 171.2 billion in 2015. This increase in credit to private sector played vital role in the development of the manufacturing sector (Economic Survey of Pakistan).

Figure 02: SBP Policy Rate
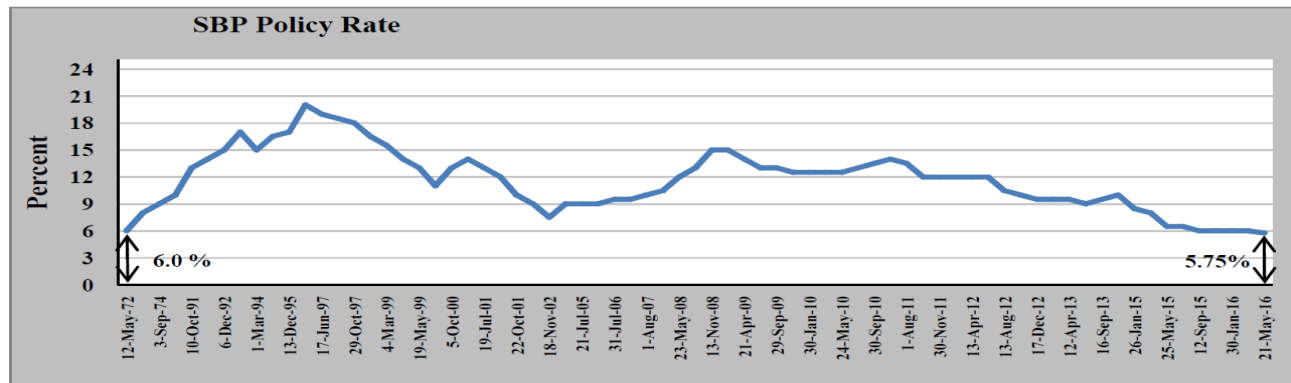
Financial sector of Pakistan also has some limitation regarding access because only 47% population use banking sector while 53% population is away from this system. There are many reasons of this problem like religious feelings and also the difficult procedure of documentation. This paper aims to study the impact of government borrowing on the financial development of Pakistan. This paper is organized as follows that section 01 discusses the introduction and section 02 explains the literature review and third section represents the theoretical frame work, data sources and econometric methodology while the last section is about concluding the study along with few recommendations.

II. Literature Review

Demetriades and Rousseau (2010) investigated the effect of government spending on the financial development for England from 1960-2010. They also spread their analysis for 84 countries and found that in short run period government borrowing crowd out financial development. Similarly, financial development also crowded out government borrowing. Their findings also described that in long run both are helpful for each in crowding in. They further expressed that low income countries do not show positive impact of government spending on financial development. Hussain et al. (2009) investigated the long run relationship of government expenditure and private investment and their findings explain that current expenditures of government like on debt servicing and defense are the cause of crowing out of private investment and the expenditures of government which are development in nature are very impressive for the private investment. These development expenditures are made on education and health. They used the time series data of Pakistan from 1975-2008. The technique which they have used is Johansen co integration. Rehman et al. (2009) determined the factors which can affect the private investment. For this purpose, they used the annual time series data of Pakistan from 1972 to 2005. They used ARDL (Auto Regressive Distributed Lags) Technique to find the long run as well as short run relationship of private investment with government expenditures. Their findings show that governance, quality of institutions, and entrepreneurial skill (Non- Traditional factors) are important factor to increase private investment. They also expressed that traditional factors impact is very marginal or even zero.

Shahe and Subika (2008) investigated that government borrowing impacts greatly to the private credit. They estimated that private credit will be crow out in the long run by the value 80 cents if government will borrow one dollar from banks. They used the panel data of 25 developing countries and the time period is from 1984 to 2004.They used the Methodology of GMM and PMG. Ahmed and Qayyum (2008) investigated that government current expenditures and interest rate are the cause of low private investment in the Pakistan. They also find out that uncertainty and instability at macroeconomic level has severed negative impact on the private investment. They used fixed private investment in

services as a dependent variable while government consumption expenditures, interest rate and GDP in real term along with uncertainty (inflation) variable. They used annual time series data of Pakistan from 1972-2005.

Ardagna et al. (2007) used the panel data of OECD countries and estimated that due to government borrowing interest rate increased which decreased the private credit. They used data of several decades for estimation. They used VAR model for the estimation and concluded that government debt from banks increased the rate of interest in the OECD countries in the long run. This rise in interest rate declined the private investment which is considered the blood for the economic growth of the countries. Fielding (2007), Sah and Stiglitz (1993) investigated that when government faces the revenue constraint and there is not suitable policy for government to have income then it goes toward the borrowing which creates problem for the private investors who want to borrow from banking sector. This is usually happened in the developing countries.

Kumhof and Tanner (2005) has investigated that it is not necessary government borrowing will always crowd out the private credit even though it helps in rise in private credit because of government assets with banks. They were of the view that banking sector is more in the position to take risk of private credit. Narayan (2004) examined the impact of government expenditures on the private investment for the country Fiji. He used the period from 1950 to 2001. He divided this period in two parts. One is from 1950 to 1975 and other is from 1976 to 2001. His final conclusions are that in the first period government expenditures are the cause of crowd in of private investment and second period showed week impact of government expenditures on private investment crowding in. Naqvi (2002) examined that government investment has great impact on private investment and then these investments play vital role to enhance the economic growth. He used co-integration VAR based methodology. He used variables in the model are private fixed capital formation, Gross Domestic Product (GDP) and public fixed capital formation. He used data of Pakistan from 1964 to 2000. He used intercept dummies whose value is one after 1973 and zero otherwise.

Sakr (1993) determined the factors of private investment in the Pakistan. He concluded that private investment is largely dependent on private credit and he also found the positive impact of public investment on the private investment. He used the data of span 1974-1992.His findings expressed that public investment only useful when it is made for infrastructure otherwise it is not impressive. The model which he used for study was flexible accelerator model.

III. Theoretical Model
Financial development of the economy is important for the economic growth of that country. Especially credit to private sector is important in many aspects like increase in employment, increase in supply of goods and improvement in standard of living of the people. Government borrowing to finance the deficit budget is critical for the private investment because small amount of finance left with the financial institutions to provide credit to private investors. Government borrowing has long run negative impact on the private investment because it crowds out the private investment (Hussain et al. 2009). Similarly, when there is increase in government spending by borrowing from banks is the cause of increase in rate of interest which badly affects the private investment (Ardagna et al. 2007). Government current expenditures and interest rate are the cause of low private investment in the Pakistan (Ahmed and Qayyum 2008).

Massive literature review indicates the impact of government borrowing on financial development. Current paper examines the long run as well as short run impact of government borrowing on financial development of Pakistan economy. For this purpose following model is developed.

$$LFD = \beta_0 + \beta_1 LPDD_t + \beta_2 LT_t + \beta_3 LS_t + \beta_4 LINF_t + \varepsilon_t$$

Where,
LFD=Log of Financial development (Domestic credit to private sector (% of GDP))
LPDD=Log of Public Domestic debt (Rs. Billion)
LT=Log of Net taxes on products (constant LCU)
LS=Log of Gross domestic savings (% of GDP)
LINF=Log of Inflation, consumer prices (annual %)

ε_t = Error Term

In this study Domestic credit to private sector (% of GDP) is used as dependent variable and this variable indicates the financial development, Public Domestic debt, Net taxes on products, Gross domestic savings, Inflation, consumer prices are used as independent variables. Here inflation is used as economic stability variable. The time span for this study is from 1972-2015. Data for all variables except public domestic debt is taken from World Development Indicators (WDI-2016) online database by World Bank. Data of public domestic debt is obtained from economic survey of Pakistan (2016).

Empirical analysis of time series data faces unit root problem, to cope this problem we use Augmented Dickey-Fuller test (ADF), which has been developed by Dickey and Fuller (1981). General for of this test is as follows.

$$\Delta W_t = \delta_0 + \delta_{1t} + \delta_{1t} + \delta_2 W_{t-1} + \sum_{k=1}^{\rho} \phi_k \, \Delta W_t - k + u_t \qquad (2)$$

$$\Delta W_t = \delta_0 + \delta_2 W_{t-1} + \sum_{k=1}^{\rho} \phi_k \, \Delta W_{t-k} + u_t \qquad (3)$$

$$\Delta W_t = \delta_2 W_{t-1} + \sum_{k=1}^{\rho} \phi_k \, \Delta W_{t-k} + u_t \qquad (4)$$

Pesaran et al.(1997, 2001),developed Bounds testing approach to check long run relationship which is prior step before applying ARDL(Auto-Regressive Distributed Lag) technique. To fulfill above purpose, following equations has been estimated which shows the short run and long run co integration among the variables.

$$\Delta LFD_t = \alpha + \sum_{i-1}^{n} \alpha_{1i} \Delta L(FD_t)_{t-i} + \sum_{i-0}^{n} \alpha_{2i} \Delta L(PDD)_{t-i} + \sum_{i-0}^{n} \alpha_{3i} L \Delta(T)_{t-i} +$$

$$\sum_{i-0}^{n} \alpha_{4i} \Delta L(S)_{t-i} + \sum_{i-0}^{n} \alpha_{5i} \Delta L(INF)_{t-i} + \delta_1 L(FD)_{t-1} + \delta_2 L(PDD)_{t-1} \qquad (2)$$

$$+ \delta_3 L(T)_{t-1} + \delta_4 L(S)_{t-1} + \delta_5 L(INF)_{t-1} + \mu_t$$

Here, FD (Domestic credit to private sector (% of GDP) is proxy of Financial Development and Δrepresent differenced variables. Where short run coefficients are denoted by αs and long run multipliers are denoted by the δs. Optimal lag length of ARDL model is denoted by 'm'. Below given is expression of ARDL null and alternative hypothesis

$$H_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$$

$$H_1 = \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$$

Bound Test will be used to test above hypotheses and we shall compute F-statistics by using equation (1). Further, we shall compare calculated value of F- statistics with tabulated critical values of (Pesaran et al., 2001) table. If F- statistics calculated value is greater than upper bound then we shall reject null hypotheses which indicate that there is no co-integration and we shall accept alternative hypotheses which indicate the co-integration. Null hypothesis will not be rejected if F- stat. value which is calculated is less in comparison of lower bound value. If the F- stat. value is in between the lower bound and upper bound then it indicates inconclusive results.

IV. Results and Discussion
In this study used the annual time series data of Pakistan for the period 1972 - 2015. Time series stationarity was tested at first step to know about the integration order. Dickey and Fuller (1979, 1981) suggested ADF (Augmented Dickey Fuller test) has been used for unit root. ADF test results have been presented in the table: 01

Table: 1.A Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	1(0)	1(1)
	Intercept	Intercept
L(FD)	-1.112494	-5.236169*
L(PDD)	-0.637321	-4.793666**

L(INF)	-3.297743**		-7.127943*
Ln(S)	-2.004105		-7.094072*
L(T)	-1.932311		-8.531699*

*, **, *** has been used to mention the level of significance at 01%, 05% and 10% respectively.

Results in table (01) indicate that all the variables are stationary at first difference while these variables were non stationary at level. When these variables were non-stationary at level and null hypotheses has not been rejected on the bases of t-statistics. According to these results all variables are integrated at level and first difference. None of the variables is integrated of order I (2). So, ARDL methodology is ideal for such data set. With the help of different lag selection criteria we have reached this point that three lag is an optimal lag for the used variables in this study. Results are given in table 02.

To get results of long-run relationship existence among the variables, F- test is applied. Null hypothesis of this test indicate no long-run relationship among the variables while alternative hypothesis means long-run relationship exists among the variables. Following table 03 have the value of F-statistic which is computed from equation 1. The value of F-statistic is 4.85 which is more than the upper bound value at 5% and 10% level of significance. When calculated value exceeds upper bound, we can reject null hypothesis of no long run relationship and accept alternative hypothesis that reveals existence of co-integration among variables. This finding gives proves that dependent and independent variables have statistically co-integration. This finding provide basis for applying ARDL approach.

Table-2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-90.87796	NA	7.39e-05	4.676974	4.885946	4.753070
1	133.7310	383.4786	4.41e-09	-5.060047	-3.806213*	-4.603470
2	152.6367	27.66691	6.29e-09	-4.762765	-2.464070	-3.925707
3	199.8154	57.53500*	2.48e-09*	-5.844652*	-2.501097	-4.627114*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

TABLE 03 ARDL Bounds Testing Approach

F-Stati-	10% significance		5% significance	
	LB I(0)	UB I(1)	LB I(0)	UB I(1)
4.89	2.45	3.52	2.86	4.01

After confirming long run relationship among variables, we move towards long run estimation of ARDL model which is on the basis of equation 1 and results of long run estimation are shown in the table 4.According to table 03 LB and UB are abbreviation of Lower bound and Upper bound respectively.

$$\Delta LFD_t = \alpha + \sum_{i-1}^{n} \alpha_{1i} \Delta L(FD_t)_{t-1} + \sum_{i-0}^{n} \alpha_{2i} \Delta L(PDD)_{t-i} + \sum_{i-0}^{n} \alpha_{3i} L\Delta(T)_{t-i} +$$

$$\sum_{i-0}^{n} \alpha_{4i} \Delta L(S)_{t-i} + \sum_{i-0}^{n} \alpha_{5i} \Delta L(INF)_{t-i} + \delta_1 L(FD)_{t-1} + \delta_2 L(PDD)_{t-1}$$

$$+ \delta_3 L(T)_{t-1} + \delta_4 L(S)_{t-1} + \delta_5 L(INF)_{t-1} + \mu_t$$

Table Error! No text of specified style in document. *Estimated Long Run Coefficients using the ARDL Approach*

ARDL(1, 1, 3, 0, 3) Dependent variable is LFD

41 observations used for estimation from 1972 to 2015

Regressor	Coefficient	Standard Error	T-Ratio	Probability
Constant	-8.225104	3.840863	-2.141473*	[0.0411]
LPDD	-0.142168	0.031432	-4.523037*	[0.0001]
LINF	-0.227846	0.088733	-2.567778	[0.0159]
LS	-0.277764	0.157899	-1.759122**	[0.0895]
LT	0.518109	0.161783	3.202501*	[0.0034]

*And ** denotes 5% and 10% level of significance, respectively.

Long run relationship between financial developments, public domestic, inflation, saving and taxes is shown in the above table. Results indicate that all variables are significant and impact the financial development in the long run. Public domestic debt which is government borrowing has negative and significant impact on financial development. Result shows that 1% increase in public domestic debt reduce the financial development by the value 0.14%. Inflation and savings are negatively impact the financial development by the value 0.22% and 0.27%, when 1% increase in these variables respectively. This study shows that taxes on products effected the financial development positively which shows that 1% increase in taxes will improve the financial development by 0.51%. Error correction model has been estimated for the short dynamic parameters on the basis of the following equation.

$$\Delta LFD_t) = \alpha_0 + \sum_{i-1}^{m} \alpha_{1i}\Delta L(PDD_t)_{t-1} + \sum_{i-0}^{m} \alpha_{2i}\Delta L(INF_t)_{t-i} + \sum_{i-0}^{m} \alpha_{3i}\Delta L(S_t)_{t-i} + \sum_{i-0}^{m} \alpha_{4i}\Delta L(T_t)_{t-i}$$

$$+\varphi(ECM)_{t-i} + \nu_t$$

Where 'ϕ' is basically coefficient of ECM which is speed or pace of adjustment from short run equilibrium point toward long- run equilibrium point. Short run adjustment has been taken place toward long-run equilibrium relationship among variables by Error Correction Model (ECM). Coefficient of ECM indicates that the model will adjust towards the long-run equilibrium from short-run disturbance by the speed of 30% per year. R-Square value is used to analyze accuracy or fitness of the model. It provides explanatory power of the model that revel how much variation in dependent variable is explained by set of independent variables. Explanatory power of the model is 92% variation in financial development of Pakistan is due the independent variables. When we adjust the model with degree of freedom output of the explanatory power is called adjusted R-square. It is net effect of explanatory power after minimizing the impact of superfluous variables or observations that is 89%. F-statistic reveals overall model fitness, calculated value of 28 and its probability value are in favor of highly significant model.

Table 1 *Error Correction Representation for the Selected ARDL Model*

ARDL(1, 1, 3, 0, 3) Dependent variable is LFD
Time Period 1972-2015

Regressor	Coefficient	Stand. Error	T-Values	Probability
dC	-2.544165	1.263467	-2.013638	[0.0537]
dL(PDD)	-0.062222	0.166617	-0.373443	[0.7116]
dL(INF)	-0.011431	0.026834	-0.425969	[0.6734]
dL(S)	-0.085917	0.046159	-1.861335	[0.0732]
dL(T)	-0.041138	0.061513	-0.668764	[0.5091]
ecm(-1)	-0.309317	0.088122	-3.510094	[0.0015]
R-Squared =0.923163 Adj R-squared = 0.890233				
F-stat. F(4, 39) = 28.03399, Prob(F-stat)= [.000]				
Mean of Dependent Variable = 3.153458				
S.D. of Dependent Variable = 0.161657				
DW value = 1.619998				

Accuracy, robustness and efficiency of result mainly based on diagnostic tests, to achieve this purpose I have applied Ramsey's RESET for function form, The Lagrange multiplier (LM) test serial correlation and Skewness Breusch-Pagan Godfirey tests for Heteroscedasticity and kurtosis of residuals for normality of residuals. These tests verified that there is no Serial Correlation, Heteroscedasticity and Functional Form problem. Diagnostic tests results have been shown in the Table 07.

Table 7: *Details of the Diagnostic Tests*

Problem	Test	X^2-statistic	F-statistic
Serial Correlation	Lagrange Multiplier	X^2= 5.741681 [0.1249]	F= 1.357051 [0.2787]
Normality	Skewness and Kurtosis of Residuals	X^2=2.2203[0.329]	-----
Functional Form	Ramsey's RESET	0.353579 [0.7264]	F= 0.125018 [0.7264]
Hetroskedasticity	White	X^2= 9.107749 [0.6937]	F= 0.666350 [0.7678] Prob. F(13,30)

To check the stability of parameters, stability tests have been applied which are (CUSUM) and (CUSUM square). Following graphs proved the stability of the model in which it has been presented that the fitted lines stays within 5% critical bounds. So, the null hypothesis of the parameters is rejected and alternative hypothesis is accepted which indicates that model is stable. Graphs show that speed of adjustment from short-run towards long-run is stable at 5% level of significance and fluctuations outside the critical bounds is not found.
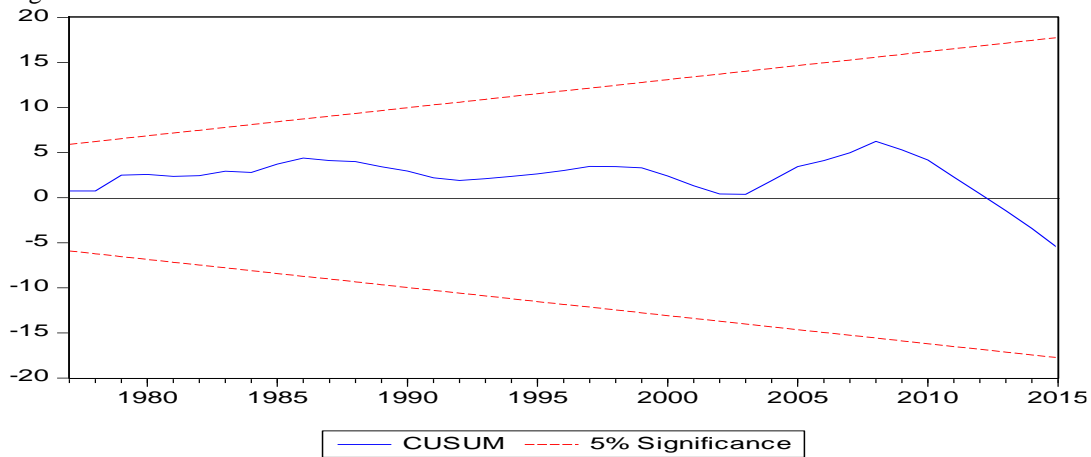

Figure 2 *Plot of Cumulative Sum of Recursive Residuals*

Red dotted lines represent five percent level of significance in CUSUM Test.

V. Conclusions

Results indicate that all variables have cointegration. Long run results shows that public domestic debt has significant negative impact on the financial development. Savings and inflation also impacts negatively. Taxes have positive impact on the financial development. From these results, we can recommend that public domestic debt should be reducing so that credit to private sector should increase. This brought development in the financial sector. Savings have a negative impact so they should be reduced in the long run because in long run for growth, consumption should be increased, then more credit will be demanded by private sector. Inflation has negative impact so it should be stable in long run. Taxes play positive role because when government will have more revenue from taxes then it does not need to get debt from financial sectors which will increase the availability of credit for the private sector. Short results are also significant and speed of adjustment is reasonable. Although diagnostic tests do not reveal good picture so there is need to reinvestigate them.

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