THE IMPACT OF GOVERNMENT DOMESTIC VERSUS EXTERNAL DEBT ON MONEY DEMAND: EMPIRICAL EVIDENCE FROM PAKISTAN

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ABSTRACT

This study attempts to analyze the relationship between government debt and money demand in the context of Pakistan by taking the annual data over the period of 1976 to 2012. In this regard, effects of government domestic alongside external debt are examined separately under the framework of Autoregressive Distributed Lag Approach of cointegration. The findings of Bound test analysis and negative sing of ECM (-1) term, both indicate that positive significant relationship exists between domestic debt and demand of real money balances in the long run as well as in short run. It suggests that government internal debt is the source of net wealth and bondholders feel them wealthier by considering the interest income as an increase in their private wealth. On the other hand, the empirical result revealed that no cointegration relationship exists between external debt and money demand, which implies that external debt does not view as a source of net wealth and government of Pakistan remains ineffective to transfer the proceeds from public external debt to the domestic individuals who are willing to invest or consume. So, in our findings, only domestic debt is appeared as a missing variable in the money demand function.

Key words: Domestic debts, external debt, demand for money, ARDL bound test, Pakistan

1. Introduction

To achieve main macroeconomic objectives, like economic growth, price stability and equilibrium in balance of payment, governments of developed as well as developing countries mostly rely on fiscal policy. In most of the cases, particularly in developing countries, fiscal stimulus has been escorted with the huge budget deficits.

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Governments of these countries are financing the deficit from internal and external resources, so, that the budget deficit is often labeled as new debt or government debt, which adversely affects the economy by raising the burden on future generation. Hence, persistent large budget deficits have been drawing attention of the economists to examine the effects of government debt on macroeconomic variables. Particularly, the debate related to debt and private sector behavior about real money balances has received considerable attentions in recent years. Empirically researchers have focused the individual's behavior by considering only the two key variables, consumption and interest rate while, the debt as the determinant of real money balance is neglected.[1] However, macroeconomic theorists have long been attentive that government debt and money demand nexus has important implication for the effectiveness of fiscal policy (Tanner and Devereux, 1993).

The efficiency of the fiscal policy is based upon the standard Keynesian proposition that government bonds are perceived as net wealth, any increase in public debt(through bounds) raises net wealth, income, consumption and desired investment of private sector (Butkiewicz,1979 and Schlicht, 2004). The impact of Government debt on the net private wealth can be generated in two ways. First, debt finance tax cut partially finances by the issuance of government bounds. If the individual does not fully discount future tax liabilities resultant from the debt, then the interest revenue from government bonds represents the net increase in private wealth (Solow and Blinder, 1974). However, this explanation ignores the foreign ownership of public debt, i.e. how external debt will generate net wealth for the domestic investors. "Conversely, government raises the perceived net wealth by channeling the bonds precede to consumers and investors" (Modigliani, 1961). Thus, external debt can be the source of private wealth, if the incomes from external debt are capably directed to the individual who are willing to invest or who are willing to consume. Yet, for properly working of this mechanism, following conditions must be fulfilled: (1) there is a strong credit market with no "liquidity trap", and banks are willing to lend more money rather than reserve it (2) individuals receive and spent the money on consumption or investment goods, rather than to save it (Cochrane, 2009).

[1] For more details see Barro (1974, 1986) and Evans (1985).

Empirically the effect of government debt on the net wealth is examined by the relationship between debt and money demand. Since money demand is a function of wealth so, any positive causal linkages between government debt and money demand would prove that debt is a source of private wealth. There is an inadequate literature regarding this relationship. In addition, the available empirical studies related to public debt and money demand nexus have typically focused on developed economies and research on developing economies especially for Pakistan is not present. Even the empirical literature related to money demand in Pakistan has also ignored the government debt as the determinant of money demand function. For example Ahmed and Khan (1990), Khan and Ali (1997) and Qayyum (1998, 2001) analyzed the money demand function by using income, exchange rate, interest rate and inflation as explanatory variables. The present study attempts to fill this gap in literature and examines the effects of government domestic verse external debt on money demand by covering the sample period from 1976 to 2012.

The rest of the study is organized as follows: the literature is reviewed in Section 2, Model specification and empirical evidences are included in Section 3 and 4, and conclusion is drawn in Section 5.

2. Literature Review

Theoretically, justification of government debt and money demand nexus in the context of IS-LM model is explained by the three schools of thought (Keynesian, Neoclassical, and Ricardian).

According to Keynesian, if there are unutilized resources then an increase in budget deficit raises the aggregate demand by the multiplier process. The increase in the aggregate demand leads to high national income and in return money demand for transaction purposes rises. In other word, financing the budget deficits through the issuance of bounds rather than through taxes raises the net wealth. Which implies that holding of government bounds by bound holders feel them wealthier due to interest payment on bound. As the net wealth of private sector rises, consumption and national income stimulates. Consequently, demand for money for transaction purposes raises. So, demand for money is a function of net wealth and rises as individuals hold more government bonds (Gulley, 1994).

The expansionary fiscal policy by financing government deficits raises the private wealth and shifts the IS curve to right in the standard IS-LM diagram. On the other hand, LM curve shifts to left because the increase in the budget deficits causes money demand to increase as long as money supply remains constant. These shifting of two curves create vagueness about the effects of expansionary fiscal policy on real income (Blinder and Solow, 1974). This issue can be solved by taking the algebraic difference between the elasticity of expenditure with respect to government debt (ED) and the elasticity of money demand with respect to debt (M). A positive value from the difference between both ED and M supports the Keynesian Propositions, while a negative value represents the perverse effect of a fiscal expansionary policy on real income.

Neoclassical also go along with the Keynesian that deficit financing positively affects the money demand in the short run. But they argued that in the long run resources are fully utilized. And at that level of full employment, output is independent of the budget deficit since the increase in the individual's net wealth represents a reduction in other private expenditure. Therefore, the budget deficit does not affect the money demand in the long run (Yellen, 1989).

While, the Ricardian Equivalence Hypothesis (REH), which is advanced by Barro (1974, 1986), states that debt finance tax cut has no impact on money demand both in short and long runs, since today tax cut accompanies by the future tax liabilities. According to this theory, issuance of government bonds to finance the deficit is regarded as an asset to bondholders. But the bondholders are considered rational and they completely anticipate such situation that these assets represent liabilities to them which are taxed by government in the future in order to redeem the bonds. However, these assets and liabilities are proportionally equal to each other; therefore, the net wealth of individuals and their consumption pattern do not change. On the other hand, national savings also remains stable. Because, reduction in government savings due to tax cut is in same proportion to increase in private savings. Ultimately, interest rate remains constant and money demand function does not shift. Thus, an increase in budget deficit has no influence on the equilibrium points of IS-LM curves.

With the passage of time many economists empirically examined the impact of government debt on money demand by using different

econometric techniques and obtained different results. Few studies are reviewed here.

First of all, Blinder and Solow (1974) used the government debt as a determinant of money demand function and Bukiewicz (1979) specified the positive relationship between both the variables. Further Deravi *et al.*, (1990) provide the same evidence by using extreme bound analysis, that government debt positively affects the money demand through the net wealth. They argue that increase federal debt appears as an increase in net wealth of the private sector and consequently the money demand raises. Similarly, Tanner and Devereux (1993) in their study, empirically examine the effects of government debt on real money balance by considering demand and supply side explanations about these effects.[1] Empirical results indicate that in US debt is not monetized during sample period (1950 to 1990). And specify that deficit raises the real money balances due to demand factors. On the other side Evans (1985) and Gulley (1994) point out that money demand is independent of the government debt. Therefore, their findings support the Barro's arguments that debt finance tax cut does not affect the consumption saving and interest rate. However Barsky *et al.,* (1986) hesitate to accept the Barro's argument by concluding that a debt finance tax cut has a positive wealth effect on consumption by raising current income. So, their finding is consistent with Keynesian proposition. Vamvoukas (1998) also supports the Keynesian by analyzing that deficit financing in the Greeck economy stimulates the transactions and hence money demand. Similarly, Khrawish *et al*., (2012), Li (2013), Li and Neill **(**2013) find a significant positive government debt and money demand correlation in Jordan and Us economy respectively. Saad and Kalakech (2009) indicate the insignificant debt- money relationship in Lebanon. Whereas, Towaijri and Khalid (2006) empirically examine negative significant relationship between these variables and highlight that government bonds are not the fraction of household's net wealth since, they are kept only by commercial banks of Saudi Arab.

[1] When Federal Reserve monetizes the government deficit and private sector does not immediately adjust money supply shocks. Then increase in money supply leads to increase in real money holdings in short run.

Thus, there is need to analyze the different wealth generating indicators by using new data set and advance econometrics techniques. In this regard, this Study empirically investigates the effects of government domestic versus external debt on demand for money individually.

3. Model Specification

3.1. Model Specification

According to Keynes money demand is normally for three motives: transaction, precautionary and the speculative. Where money demand for both transactional and precautionary motives is proportionally related with income and for speculation motives is negatively related with the interest rates. He also defined that money is valued in terms of what it can buy, so, individual want to hold some amount of money in real terms that positively relates to income and negatively relates to interest rates and inflation (Mishkin, 1997). The role of government debt in money demand function can be justified on several grounds, especially; in term of net wealth effect is discussed by some authors such as Blinder and Solow (1974), Butkiewicz (1979) and Deravi *et al.*, (1990). Hence to analyze the effect of the government debt on money demand, the specification of money demand functions that includes government domestic and external debt as independent variables can be written as:

$$M = \alpha_0 + \alpha_1 Y + \alpha_2 i + \alpha_3 P + \alpha_4 DB + \mu \quad (1)$$

$$M = \beta_0 + \beta_1 Y + \beta_2 i + \beta_3 P + \beta_4 EB + \mu_1 \quad (2)$$

Where M is real money demand, Y is real GNP, i is interest rates, P is price level, DB is real domestic debt outstanding and EB is real external debt outstanding.

The models are estimated using the annual data for Pakistan over the period from 1976 to 2012. All the data is collected from the World Development Indicator (WDI) database, Hand Book of Statistics on Pakistan Economy and Pakistan Economic Survey. All variables are taken in to local currency unit except the external public debt. The later is

converted in to local currency by using the market exchange rate. All data series except inflation and interest rate are deflated by GDP deflator and transformed in to logarithmic form.

3.2 Estimation Technique

The present study deals with time series data to examine the impact of government domestic vs. external debt on money demand. In this regard, stationery properties of all variables are checked first by the unit root tests and further, Autoregressive Distributed Lag (ARDL) technique is conducted to analyze cointegration among them.

3.3 Unit Root Test

According to the time series econometrics literature, before the estimation, it is necessary to investigate the order of integration of each series to confirm that whether series are stationary or non-stationary.[1] If time series data is non stationary, then the results from regression analysis may be spurious (Granger and Newbold, 1974).[2] To overcome such problem Unit root test has been used over the past several years. Thus, Present study employed two conventional unit root tests; Augmented Dickey–Fuller Test (ADF) and Phillip-Perron Test (PP) to determine the order of integration. And to ensure the precision of unit root results in all series. Integrating order of each series is checked by using the two specifications, with intercept and intercept with time trend. The statistics at level as well as at first difference are summarized in Table 1. The results from both conventional unit root tests are consistent for all the variables which indicate that variables are integrated at different orders, i.e. I(0) and I(1).

3.3 The ARDL Bound Testing Approach of Cointegration

It is evident from table 1 all the variables are not integrated at same level one: I(1). Hence, we can proceed to estimate the cointegration analysis by using Autoregressive Distributed Lag (ARDL) approach rather than conventional methods (Engle-Granger, Johansen-Juselius (J-J)).[3] The

[1] Stationarity of series means, mean, variance and covariances of such series are independent of time.

[2] In ordinary least square regression, R^2 is very high and tests for statistical inference are invalid See Asteriou (2006, pp.339).

[3] These conventional methods of cointegration require all the variables are integrated at same order i.e., I(1).

main reason of using the ARDL method is that it can be applied irrespective of the stationarity properties of regressors, whether the underlying regressors are integrated at level I(0), or I(1) and mutually cointegrated (Pesaran *et al*., (2001). Another reason to prefer the ARDL approach is that it simultaneously estimates long run equilibrium and short run dynamics among the given set of variables. In addition it performs well for small sample relative to other cointegration methods (Pesaran and Shin, 1999).

The ARDL bound testing approach consists of the unrestricted error correction model (UECM) to examine both long run and short run relationship. The form of UECM models adapted into present study is as follows:

$$\Delta M = \alpha 1 + \alpha 2(M)t-1 + \alpha 3(Y)t-1 + \alpha 4(i)t-1 + \alpha 5(P)t-1 + \alpha 6(DB)t-1 + \sum_{j=1}^{m} \alpha 7 \Delta(M)t-j \sum_{j=1}^{m} \alpha 8\, \Delta(Y)t-j + \sum_{j=0}^{m} \alpha 9\, \Delta(i)t-j \sum_{j=0}^{m} \alpha 10\, \Delta(P)t-j + \sum_{j=0}^{m} \alpha 11\, \Delta(DB)t-j + \mu 1 \quad (3)$$

$$\Delta M = \beta 1 + \beta 2(M)t-1 + \beta 3(Y)t-1 + \beta 4(i)t-1 + \beta 5(P)t-1 + \beta 6(DE)t-1 + \sum_{j=1}^{m} \beta 7 \Delta(M)t-j \sum_{j=1}^{m} \beta 8\, \Delta(Y)t-j + \sum_{j=0}^{m} \beta 9\, \Delta(i)t-j \sum_{j=0}^{m} \beta 10\, \Delta(P)t-j + \sum_{j=0}^{m} \beta 11\, \Delta(DE)t-j + \mu 2 \quad (4)$$

The first part of the equation (3) and (4) with the parameters $\alpha 2, \alpha 3, \alpha 4, \alpha 5, \alpha 6, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 refer the long run relationship while the rest of the $\alpha 7, \alpha 8, \alpha 9, \alpha 10, \alpha 11, \beta_7, \beta_8, \beta_9, \beta_{10}$ and β_{11} represent the short run dynamics of the models. 'm' depicts the optimal lag length.

According to Pesaran and Pesaran (1997) the ARDL approach of cointegration follows the three steps: namely, step one is the verification of the existence of long run relationship among the variable by conducting the Wald test (F-test). This test is established to test the basic hypothesis: all the coefficients of lagged level variables are equal to zero ((H_{01}: $\alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = 0$), ($H_{02}$: $\beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$)), which implies that no cointegration between the variables, against the alternative hypothesis at least one of the coefficient of lagged level variables is not equal to zero. The estimated value of standard F-test is compared with non-standard distributed asymptotic critical bound values reported by

Pesaran and Pesaran (1997) or Pesaran *et al*., (2001). If the computed value of F-statistics lies outside the upper critical value, then null hypothesis of no cointegration is not accepted, regardless of the integration order of underplaying variables. Similarly, if F-statistic lies below the lower critical bound value, then null hypothesis is not rejected. if the calculated value falls between these two critical bounds, then inference about cointegration becomes inconclusive. After finding the existence of long run relationship, the next step is the analysis of long run coefficients by estimating following ARDL models.

$$M = \alpha 1 + \sum_{j=1}^{m} \alpha 2(M)t-j \sum_{j=1}^{m} \alpha 3\,(Y)t-j + \sum_{j=0}^{m} \alpha 4\,(i)t-j \sum_{j=0}^{m} \alpha 5\,(P)t-j + \sum_{j=0}^{m} \alpha 6\,(DB)t-j + \varepsilon 1 \quad (5)$$

$$M = \alpha 1 + \sum_{j=1}^{m} \alpha 2(M)t-j \sum_{j=1}^{m} \alpha 3\,(Y)t-j + \sum_{j=0}^{m} \alpha 4\,(i)t-j \sum_{j=0}^{m} \alpha 5\,(P)t-j + \sum_{j=0}^{m} \alpha 6\,(DE)t-j + \varepsilon 1 \quad (6)$$

The third step is the estimation of short run coefficients by using the error correction model (Dusa, 2007). The error correction models are expressed as:

$$\Delta M = \alpha 1 + \sum_{j=1}^{m} \alpha 2\Delta(M)t-j + \sum_{j=1}^{m} \alpha 3\,\Delta(Y)t-j + \sum_{j=0}^{m} \alpha 9\,\Delta(i)t-j + \sum_{j=0}^{m} \alpha 10\,\Delta(P)t-j + \sum_{j=0}^{m} \alpha 11\,\Delta(DB)t-j \gamma ECM1t-1 + \varepsilon 1 \quad (7)$$

$$\Delta M = \alpha 1 + \sum_{j=1}^{m} \alpha 2\Delta(M)t-j + \sum_{j=1}^{m} \alpha 3\,\Delta(Y)t-j + \sum_{j=0}^{m} \alpha 9\,\Delta(i)t-j + \sum_{j=0}^{m} \alpha 10\,\Delta(P)t-j + \sum_{j=0}^{m} \alpha 11\,\Delta(DE)t-j \gamma ECM2t-1 + \varepsilon 2 \quad (8)$$

Where the lagged error correction terms ECM1 and ECM2 are derived from long run equation (5) and (6) respectively and γi′s is the coefficient of these error correction terms, which indicates the speed of adjustment towards the long-run equilibrium after short run disturbances. Its statistical significant negative value also ensures that long run equilibrium is achieved. Further stability and diagnostics tests (that consist of Serial Correlation LM tests, Heteroscedasticity test, Normality test and Ramsey Reset test) are conducted to confirm the goodness of fit of the estimated equations in the entire ARDL models. The structural stability test is employed by plotting Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Square Recursive Residuals (CUSUMSQ) tests, proposed by Brown *et al*., (1975).[1] The estimated coefficients are called stable when the plots of CUSUM and CUSUMSQ statistics lie within the five percent significance level.

[1] The CUSUM and CUSUMSQ statistics are plotted against the break points after breaking the sample period.

4. Empirical Results

4.1 Results of Unit Root test

Table 1: Results of Unit Root Test

	ADF test				PP Test			
Variables	Levels		First difference		Levels		First difference	
	Intercept	Intercept & trend	Intercept	intercept & trend	Intercept	intercept & trend	Intercept	intercept & trend
LnM	-2.85*	-2.11	-4.78**	-5.19*	-2.87*	-2.16	--4.77**	-5.13**
LnY	-2.53	-3.09	-5.33**	-5.90**	-2.47	-3.21*	-5.53**	-6.03*
LnDB	-2.74*	-1.62	-4.28**	-4.56**	-2.66*	-1.633	-4.32**	-4.50**
LnED	-1.81	-0.70	-4.63**	-4.94**	-1.77	-0.79	-4.59**	-4.87**
I	-2.10	-2.11	-5.53**	-5.52**	-2.32	-2.31	-5.53**	-5.52**
P	-2.94**	-2.98	-7.46**	-7.36**	-3.00**	-3.04	-7.46**	-7.38**

Note: the appropriate lag length in ADF test is determined, by using Akaike information criterion (AIC) and in PP test, by using Bartlett Kernel method. **and *Represent that both ADF and PP tests are able to accept the alternative hypothesis of stationarity of series at 5% and 10 % significance level.

4.2 Empirical Results of ARDL Cointegration Test

By following the first step of ARDL bound testing approach the optimal lags for the models 3 and 4 are selected on basis of least values of AIC and SIC.[1] The results are given in table 2.

Table 2: Lag length selection

Model 3				
Lag length	AIC	SIC	Breusch- Godfery Autocorrelation test	
1	-2.87	-2.38	3.05	(0.08)*
2	-2.94	-2.23	0.68	(0.51)
3	-3.22	-2.26	4.10	(0.04)**
Model 4				
1	-2.82	-2.33	0.55	(0.46)
2	-2.84	-2.12	0.87	(0.43)
3	-2.95	-2.00	1.82	(0.005)**

Notes: **and *denote 5% and 10% level of significance and auto correlation.

[1] Number of lags in any model selects on the basis of the lowest critical values of AIC and SIC. If model's duration of lag selects at the minimum critical values and holds an autocorrelation, then duration of lag is selected at the second minimum critical value. If the problem of serial correlation still continues, then this process will carry on until this problem is solved.

According to the above results in table 2, the optimum lag length 2 is selected for both models (3) and (4). After determining the lag order, UECM models (3) and (4) are estimated to examine the existence of long run relationship among the given variables. In this regard, Wald test is conducted and calculated values of F statistics are compared with the critical bound values. The results of bound test along with diagnostics tests are reported in Table 3.

Table 3: Bound Test for Cointegration

Model 3				
K	F-Statistics	Critical value		
			Lower bound critical value	Upper bound critical value
4	4.90*	1%	3.81	5.12
		5%	2.85	4.04
		10%	2.12	3.57
Diagnostic Tests				
R^2= 0.72		F_1 = 3.14 (0.01)		DW= 2.21
F_{RAMSEY} =0.717 (0.502)		F_{LM} = 0.68 (0.04)		F_{NORMAL} = 0.73 (0.69)
F_{WHITE} = 2.51 (0.24)				
Model 4				
K	F-Statistics	Critical value		
			Lower bound critical value	Upper bound critical value
4	3.494	1%	3.81	5.12
		5%	2.85	4.04
		10%	2.12	3.57
Diagnostic Tests				
R^2= 0.692		F_1 = 2.707 (0.023)		DW= 2.15
F_{RAMSEY} = 0.317 (0.732)		F_{LM} = 0.878 (0.434)		F_{NORMAL} = 0.162 (0.921)
F_{WHITE} = 8.433 (0.051)				

Note: k indicates the number of independent variables. * (**) represent10% (5%) level of significance at given critical values, tabulated by Pesaran *et al.,* (2001).

As observed from the table 3; the calculated value of F-test of model (3) is exceeded the upper bound critical values at 5 and 10 percent level of significance. Thus, the null hypothesis is not accepted which implies that long run relationship exists between the given series in model (3). While on the other side, the calculated value of F-statistic of model (4) is laid between the critical bound values at 5 and 10 percent level of

significance, which implies that no cointegration relationship exists among the real money demand, government external debt, real income, interest rate and prices. Since cointegration exists between the domestic public debt and money demand. In the next steps, long run and short run coefficients are estimated. In order to determine the long run coefficients, Equation (5) is estimated by regressing the real money demand on domestic debt along with control variables and results are presented in the following table.

Table 4: Long Run ARDL (1, 1, 0, 0, 2) (Dependent Variable: M)

Variable	Coefficient	t-Statistic	Prob.
C	0.233	0.611	0.546
M(-1)	0.883	5.662	0.000**
Y	0.864	1.843	0.076*
I	-0.009	-1.775	0.087*
P	0.002	0.712	0.482
DB	0.245	1.852	0.075*
y (-1)	-0.814	-1.521	0.140
DB (-1)	-0.338	-1.748	0.092*
DB (-2)	0.137	1.079	0.290
Long Run Coefficients		Diagnostic tests	

R^2= 0.991	F_1 = 361.42 (0.00)	DW= 1.668
F_{RAMSEY} = 2.372 (0.114)	F_{LM} = 0.880 (0.427)	F_{NORMAL} = 3.159 (0.2060)
F_{WHITE} = 1.23 (0.330)		

Note: * (**) denote significance level at 10% (5%).

It can be seen from the table that all the estimated long run coefficients have expected sing and are statistically significant at 5 and 10 percent levels except prices. The estimated coefficient of interest rate (opportunity cost of holding money) is negatively while real income and domestic debt are positively related with money demand; which are consistent with economic theories. The results reveal that one present increase in real income raises money demand by 0.864 percent, which indicates that an increase in the income level raises the purchasing power, individual's standard of living and hence the money demand. Our findings also suggest that an increase in domestic debt by one percent point enhance the demand of real money balances by 0.46 percent point. It

implies that domestic debt raises the net private wealth without fully discounting future tax liabilities because government bonds are considered as the interest bearing assets. This result negates the Ricardian Views and consistent with the Keynesian proposition, that government debt positively affects the money demand by raising the net wealth. The result of diagnostic tests presented in the lower portion of table 4 shows that model pass the entire test, which acknowledges that impact of government domestic debt on money demand is robust and stable.

After finding the long run coefficients, short run dynamics of variables is analyzed by estimating the ECM (equation 7) and Results with diagnostic tests are presented in table 5.

Table 5: Error Correction Model (1, 0, 0, 0, 1) (Dependent Variable: ΔM)

Variable	Coefficient	t-Statistic	Prob.
C	-0.013	-0.620	0.540
ΔM(-1)	0.346	2.087	0.067*
Δy	0.974	2.537	0.017**
Δi	-0.005	-0.896	0.378
Δp	0.004	1.333	0.193
ΔDB	0.220	1.905	0.067*
ECM (-1)	-0.298	-1.960	0.060*
ΔDB (-1)	-0.227	-1.766	0.088*
Diagnostic tests			

R^2= 0.503	F_1 = 3.915 (0.004)	DW= 2.007
F_{RAMSEY} = 1.016 (0.322)	F_{LM} = 0.038 (0.845)	F_{NORMAL} = 0.521(0.770)
F_{WHITE} = 1.030 (0.462)		

Note: * and ** denote significance level at 10% and 5% respectively.

As seen from the consequence of ECM estimation, coefficients of interest rate and prices have no significant impact on the short run money demand. Whereas the coefficients of domestic debt and real income have a significant positive effect on money demand, that supports both Keynesian and New classical views. The result also reveals that coefficient of lag error correction term is negative and statistically significant, which confirms the long run relationship among the variables and suggests that

deviation from the long run equilibrium level of real money demand is corrected by around 30 percent adjustment in one year. Further, robustness of short run estimations is checked by diagnostic and stability tests. Our findings indicate that short run model clears all the diagnostics tests successfully. Stability of both long run and short run estimated coefficients are checked by CUSUM and CUSUMSQ tests. As it is observed from the figures the sketch of both tests lie within the critical bound of 5% significance level, which verifies the stability of both long run and short run coefficients of regressors over the sample period. (See appendix 1).

5. Conclusions

The present study has investigated the impact of domestic and external debt on money demand in the context of Pakistan by adopting advance econometric techniques. In this regards, stationarity properties of annual data set have checked first by the ADF and PP unit root tests and result reveals that series are integrated at different orders. Further the long run relationship of domestic and external debt with money demand has been tested by ARDL Bound testing approach. The empirical evidence indicates that government domestic debt has positive significant impact on real money demand in long run. This finding is consistent with the part of literature which supports Keynesian proposition, that the government debt is source of net private wealth. It implies that domestic debt raises private individual wealth without discounting future tax liabilities. While on the other hand, evidence indicates that external debt fails to raise private wealth. It suggests that the proceeds from the foreign debt are not properly shifted to individuals who are willing to consume and invest, either because the financial market is not working effectively or the private sector saves the receiving amount rather than to invest/consume.

The analysis of ECM also supports domestic debt and money demand nexus in the short run, and reveals that almost 30 percent of the deviations from the long run equilibrium of money demand are corrected within one year. Further, Statistics of CUSUM and CUSUMSQ Stability tests do not show any structural changes in the model over the selected sample period. Hence, it can be concluded from the estimation/ or our findings that domestic debt is the component of money demand function, while external does not raise the private wealth in Pakistan; So the

government of Pakistan may use both monetary and fiscal policies as a relevant policy tool to control excessive burden of external debt. However, attention should be paid on foreign exchange by strengthening export activity.

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Appendix

Figure (1-4): Long Run Results of CUSUM and CUSUMSQ Tests

The straight lines denote critical bounds at 5% level of significance.

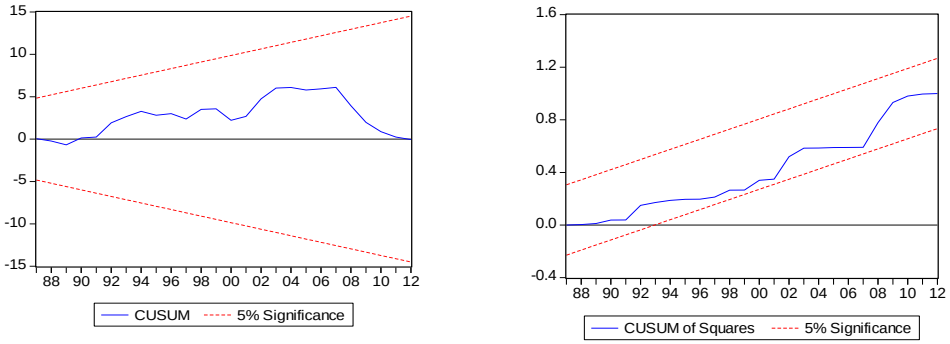
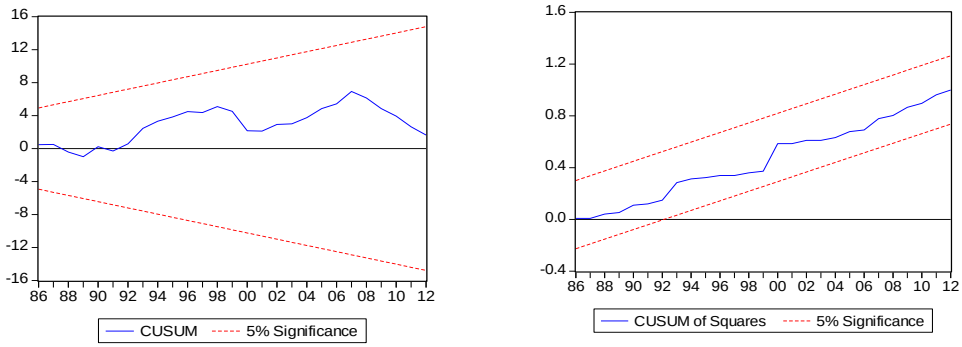


Figure: Long Run Results of CUSUM and CUSUMSQ Tests



The straight lines denote critical bounds at 5% level of significance.