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The Bounds Test Approach for Co-integration and Causality Relationship between Financial Development and Economic Growth in Bangladesh

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Abstract: *This paper empirically examined the supply-leading or demand-following hypotheses in case of Bangladesh using time series data for the period of 1974 to 2009. The ADF and PP tests results support that all the variables are integrated of order 1. The ARDL bounds test results indicate that there exist three forms of long-run relationships between the variables. The Granger F-test results supports that the supply-leading hypothesis is accepted in Bangladesh economy indicates that at the preliminary stage of economic development in Bangladesh financial development causes the economic growth. It is also found that long-run elasticity of economic growth with respect to M2 is higher than short-run elasticity.*

Thus it can be said the new policy which is formulated by Bangladesh Bank for contraction money supply to control inflationary rate will be harmful for economic growth. The diagnostic tests results support that the model is well specified, and there are no problems of autocorrelation, heterpscedastcity, normality and ARCH in the model. The CUSUM and CUSUMSQ tests results support that all the coefficients in the error correction model are stable. Therefore policies about economic growth can be made based on the preferred model.

Keywords: *Economic Growth, ADF and PP tests, ADRL bound test, Causality.*

JEL Classification: C23, C32, C33, O50, O57, Q40

1. Introduction

Financial development plays significant role for achieving high rate of economic growth and expected to have a positive relationship with economic growth. But the results are different in high inflated countries i.e. Latin American countries; further financial development shows a negative impact on the economic growth, Gregorior and Guidotti (1995). Therefore the research of this aspect becoming more importance for all societies from developing countries to developed countries.

Now-a-days, studies draw a greater attention for the researchers to check causality relationship between financial development and economic growth. The enormous amount of empirical works to examine the causal relationship between financial development and economic growth fall into four categories; (i) no causal relationship between financial

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development and economic growth, (ii) unidirectional causality from financial development to economic growth, (iii) unidirectional causality from economic growth to financial development and (iii) bidirectional causality between financial development and economic growth. The history shows that in Bangladesh the bank and non-bank financial institutions depict household's investment and allocation fund. The bank and non-bank financial institutions have strong externalities in this perspective, which are generally positive but in financial crises it can also be negative. Literatures recommended that financial market can be negatively affected by high inflation rate, simply it can be explained that the financial development is a function of inflation.

In Bangladesh in the year 2012, due to the increase of the inflationary rate, the Bangladesh Bank formulated a new policy regarding contraction of money supply to control inflation. Thus a simple question arises in our mind whether the new policy which is formulated by Bangladesh Bank regarding contraction of money supply will be harmful for economic growth in Bangladesh.

Thus to give the answer of this question the principal purpose has been made to investigate the short-run and long-run impacts of money supply on economic growth using the time series data for the period of 1974 to 2009. This empirical study involves three prime objectives. At the first stage, whether each variable contains a unit root is examined using ADF and PP tests. At second stage, the long-run co-integration relationship between money supply and economic growth is examined using the ARDL bounds test approach and finally short-run and long-run causality relationships between them is investigated using Granger F-test. Finally using GMM technique long-run and short-run elasticities of economic growth with respect to M2 and Dc are estimated.

The organizational structure of the paper is as: Section 2 discusses the literature review; Section 3 discusses data sources and methodology and finally section 4 concludes with a summary of the findings and policy implications.

2. Literature Review

In the last three decades, a number of empirical studies are conducted to find the relationship between economic growth and financial development which includes Jordan and Morris (2002), Prabir and Sivasubramanian (2003), Tsangyao and Steven (2005), Nikolaos and Antonios (2004), Mouawiya and Nasri (2005), and Muhammad and Umer (2010), found long-run relationship between financial development and economic growth.

Rati Ram (1999) empirically examined the association between financial development and economic growth in 95 different countries and found huge heterogeneity and weak negative covariation between financial development and growth of real GDP per capita. Jordan & Morris (2002) investigated the causality between financial development and

economic growth by using quarterly data of 19 OECD countries and China and found weak evidence that financial development lead to economic development. Prabir and Sivasubramanian (2003) examined the causality relationship between financial development and economic growth in case of India by applying unit root and cointegration analysis and found that financial development led to GDP growth but GDP does not cause the financial development. Tsangyao & Steven (2005) is used the VEC model to investigate the causality relationship between financial development and economic growth in case of Taiwan and found the unidirectional causality running from financial development to economic growth. Nikolas and Antonios (2004) empirically investigated the causal relationship among financial development, degree of openness of the economy and economic growth by using a Granger causality and cointegration approach in case of Greece and found that there is one cointegrated vector among GDP, financial development and the degree of openness of the economy and a causal relationship between financial development and economic growth, but also between the degree of openness of the economy and economic growth. Mouawiya and Nasri (2005) examined the causality relationship between financial development and economic growth for the panel of in case of Middle Eastern countries and found existence of long run relationship between financial development and economic growth, and also from the panel causality tests it is found that real economic growth causes the financial development. Jordan and Morris (2005) examined relationship between financial development and economic growth in case of ten OECD countries and China and found the weak hypothesis that financial development leads to economic growth. Zhicheng Liang (2005) examined the relationship between finance and economic growth in case of 29 Chinese provinces by using Generalized Method of Moments (GMM) approach and found that the financial sector significantly supports China's economic growth. Xun Lu, Dietrich, and Russell (2007) investigated the relationship between financial sector development and economic growth by assisting capital accumulation and enhancing the productivity in case of China by employing cointegration and Granger-causality approaches and identified that there is bi-directional causality between financial development and capital accumulation and the link between financial development and productivity is to be statistically weak. Zang and Kim. (2007) investigated the association between financial development and economic growth by employing Sims–Geweke causality tests and concludes that there is no evidence of any positive unidirectional causal relation from financial development to economic growth. Boopen (2008) investigated the relationship between financial development and economic performance in case of Mauritius applying ARDL cointegration approach and come up with conclusion that financial development contributing to the output level of the economy in both short and long run. Song, Zhen and Wu. (2008) examined the association between

financial development and economic growth in case of South Korea by applying nonlinear smooth transition error correction technique and cointegration approach and found a long-run equilibrium relationship between financial development and economic growth. Muhammad and Umer (2010) empirically examined the co-integration and causality relationship using the bound testing approach in case of Pakistan and found the existence of long-run relationship between financial development and economic growth and also found the unidirectional causality from economic growth to financial development.

The existing literature reveals that due to the application of different econometric methodologies and different sample sizes the empirical results are very mixed for different countries and are not conclusive to present policy formulation that can be applied over the countries. Thus this study tries to overcome the shortcoming literature related with the linkage between financial development and economic development. Also this empirical study will be important to formulate policy recommendation from the point of view of money supply and economic growth in case of Bangladesh.

3. Data and Methodology

Annual data for per capita real GDP (PGDP) (constant 2000 US $) which is used as the proxy of economic growth, broad money (M2) and domestic credit (DC) which are used as the proxies of financial development are downloaded from the World Bank's Development Indicators. The data is for the period from 1974 to 2009. In order to find the long-run relationship between economic growth and financial development in Bangladesh the following linear logarithmic model is proposed

$$\ln PGDP_t = \beta_0 + \beta_1 \ln M2_t + \beta_2 \ln DC_t + \varepsilon_t \quad (1)$$

Where, ln PGDP, ln M2 and ln DC are the logarithmic forms of per capita real GDP, broad money (M2) and domestic credit (DC). The parameters β_1, and β_2 represent long-run elasticity of economic growth with respect to M2 and DC respectively. The empirical investigation of the dynamic causal relationship between economic growth and financial development involves the following steps. At the first step whether each variable contains a unit root is examined. If the variables contain a unit root, the second step is to test whether there is a long run-cointegration relationship between the variables. If a long-run relationship between the variables is found, the final step is to estimate error correction model in order to infer the Granger causal relationship between the variables. Finally using GMM technique long-run and short-run elasticities of economic growth with respect to M2 and Dc are estimated.

3.1 Unit root tests

It is well known that the usual techniques of regression analysis can result in highly misleading conclusion when variables contains stochastic trend (Stock and Watson (1988), Granger and Newbold (1974)). In particular if the dependent variable and at least one independent variable contain stochastic trend, and if they are not co-integrated, the regression results are spurious, (Phillips (1986), Granger and Newbold (1974)). To identify the correct specification of the model, an investigation of the presence of stochastic trend in the variables is needed. To test for the stationarity of economic growth and financial development the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests are applied. The estimation technique of these two tests is described below;

$$\Delta X_t = \alpha_0 + \alpha_1 t + \theta X_{t-1} + \sum_{i=1}^{m} \phi_i \Delta X_{t-i} + u_t \quad (2)$$

Here X_t is the series under investigation, Δ stands for first difference and the lagged difference terms on the right hand side of the equation are designed to correct for serial correlations of the disturbance terms. The lagged differences are selected by using the AIC and SBIC criteria. If $\theta = 0$, the series X_t contains a unit root and therefore an I(1) process governed by a stochastic trend. If a time series variable is integrated of order one, we have to investigate the 2nd order unit root and the equation is given by;

$$\Delta^2 X_t = \beta_0 + \lambda \Delta X_{t-1} + \sum_{i=1}^{m} \gamma_i \Delta^2 X_{t-i} + \varepsilon_t \quad (3)$$

where Δ^2 is the second-difference operator. If $\lambda = 0$, the series X_t is said to be integrated of order two (I(2)) and so on. Since the estimated θ does not have the usual asymptotic distribution, the values tabulated by MacKinnon (1991) are used; these values are more accurate than the ones original tabulated by Fuller (1976) and Dickey-Fuller (1987). The Augmented Dickey Fuller (ADF) and the Philips-Perron (PP) tests results are reported below;

Table 1: The Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) Tests Results

Variables	ADF Test[Level Form]		PP Test [Level Form	
	Case One	Case Two	Case One	Case Two
lnPGDP	1.30927	5.69596	-0.92871	7.282652
lnM2	-2.49982	-1.41377	-1.69757	-0.93850
lnDC	-2.44992	-0.90797	-2.03474	-0.78106x
	1st Differenced Form		1st Differenced Form	
ΔlnPGDP	-4.36002**	-2.00055	-10.5069**	-6.00133**
ΔlnM2	-4.13251*	-3.94922**	-5.03242**	-4.78956**
ΔlnDC	-4.35167**	-4.28914**	-5.02826**	-4.93553**

Case One: Constant and trend terms are included in the model, Case Two: Only constant term is included in the model **: indicates significant at 1% level, *: indicates significant at 5% level.

The ADF and PP tests results support that the variables lnPGDP, lnM2 and lnDC are integrated of order 1.

3.2 Bounds Test Approach for Cointegration

The bounds test approach for cointegration, known as the autoregressive-distributed lag (ARDL) of Pesaran, Shin and Smith (2001), has become most popular amongst researchers. The bounds test approach has certain econometric advantages in comparison to other single equation cointegration procedure. They are as follows; (i) enddogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger method, are avoided; (ii) the long-run and short-run parameters of the model in question are estimated simultaneously; (iii) the bounds test approach for testing the existence of long-run relationship between the variables in levels is applicable irrespective of whether the underlying time series variables are purely I(0), I(1) or fractionally integrated; (iv) the small sample properties of the bounds testing approach are far superior to that of multivariate.

In this paper to implement the bounds test for cointegration, the following unrestricted regression equations are formulated;

$$\Delta \ln PGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta \ln PGDP_{t-i} + \sum_{i=0}^{p} \alpha_{2i} \Delta \ln M2_{t-i} + \sum_{i=0}^{p} \alpha_{3i} \Delta \ln DC_{t-i} + \alpha_4 \ln PGDP_{t-1} + \alpha_5 \ln M2_{t-1} + \alpha_6 \ln DC_{t-1} + \varepsilon_{1t} \quad (4)$$

$$\Delta \ln M2_t = \beta_0 + \sum_{i=0}^{p} \beta_{1i} \Delta \ln PGDP_{t-i} + \sum_{i=1}^{p} \beta_{2i} \Delta \ln M2_{t-i} + \sum_{i=0}^{p} \beta_{3i} \Delta \ln DC_{t-i} + \beta_4 \ln PGD_{t-1} + \beta_5 \ln \ln M2_{t-1} + \beta_6 \ln DC_{t-1} + \varepsilon_{2t} \quad (5)$$

$$\Delta \ln DC_t = \lambda_0 + \sum_{i=0}^{p} \lambda_{1i} \Delta \ln PGDP_{t-i} + \sum_{i=0}^{p} \lambda_{2i} \Delta \ln M2_{t-i} + \sum_{i=1}^{p} \lambda_{3i} \Delta \ln DC_{t-i} + \lambda_4 \ln PGDP_{t-1} + \lambda_5 \ln M2_{t-1} + \lambda_6 \ln DC_{t-1} + \varepsilon_{3t} \quad (6)$$

According to Pesaran et al. (2001), the joint F-test of the lagged level variables in equations (4), (5), and (6) are used to test the presence of long-run equilibrium relationship. For instance in equation (4) the test for cointegration is carried out by testing the null hypothesis of no conintegration is defined by H_0: $\alpha_4 = \alpha_5 = \alpha_6 = 0$, using the F-test . The order of lags for each variable in unrestricted regression equations are determined using the AIC and SBIC criterion. The variables are said to be cointegrated if the null hypothesis of no cointegration is rejected; otherwise the variables are not cointegrated. Similarly, procedures can also be carried out for testing the long-run equilibrium relationships for equations (5) and (6). The asymptotic distribution of the F-statistic is non-standard under null hypothesis and it was originally derived and tabulated by Pesaran et al. (2001) but later modified by Narayan (2005) to accommodate small sample sizes. Two sets of critical values are provided; one which is appropriate where all the series are I(0) and the other is appropriate where all the variables are I(1). According to Pesaran et. Al. (2001), if the calculated F-statistic falls above the upper critical value, a conclusive inference can be made regarding cointegration without knowing whether the series are I(0) or I(1). In this case the variables are said to be cointegrated indicates existence of long-run relationship among the variables. Alternatively if the calculated F-statistic falls below the lower critical value the null hypothesis of no cointegration will not be rejected regardless whether the series are I(0) or I(1). In contrast the inference is inconclusive if the calculated F-statistic falls within lower and upper critical values unless we know whether the series are I(0) or (1). The results of the bounds test for cointegration, together with the response surface critical values for T=36, are recorded in Table 2.

Table 2: The Results of F-Test for Cointegration Relationship

Functional Forms	F-test Value	Critical Values
f(lnPGDP|lnM2,lnDC)	11.06430**	At 1% level; 4.614-5.966
f(lnM2|lnPGDP,lnDC)	5.36105*	At 5% level; 3.272-4.306
f(lnDC|lnPGDP,lnM2)	4.36534*	At 10% level; 2.676-3.586

Source: Turner (2006) Response Surface Producer; **: indicates significant at 1% level, *: indicates significant at 5% level.

The computed F-statistic for three equations exceeds the 5 per cent upper critical values indicating that the variables economic growth and financial development are cointegrated. This implies that the economic growth and financial development are moving together in the long-run although deviations may occur in the short-run.

Since, it is found that there exists a cointegration vector among the variables; the following cointegration model is projected here,

$$\text{lnPGDP}_t = \delta_0 + \sum_{i=1}^{p} \delta_{1i} \text{lnPGDP}_{t-i} + \sum_{i=0}^{p} \delta_{2i} \text{lnM2}_{t-i} + \sum_{i=0}^{p} \delta_{3i} \text{lnDC}_{t-i} + \omega_t \quad (7)$$

The selection of the orders of lags in the ARDL models is very sensitive which is done by using two criterion Akaike Information Criteria (AIC) and Schwarz Bayesian Information Criteria (SBIC). The short run association among the variables can be calculated considering the following error correction model

$$\Delta\text{lnPGD}_t = \psi_0 + \sum_{i=1}^{p} \psi_{1i} \Delta\text{lnPGDP}_{t-i} + \sum_{i=0}^{p} \psi_{2i} \Delta\text{lnM2}_{t-i} + \sum_{i=0}^{p} \psi_{3i} \Delta\text{lnDC}_{t-i} + \lambda \text{ECM}_{t-1} + u_t \quad (8)$$

where ECM_{t-1} is the error correction term which is obtained from the following estimated cointegration equation

$$\text{ECM}_t = \text{lnPGDP}_t - \hat{\delta}_0 - \sum_{i=1}^{p} \hat{\delta}_{1i} \text{lnPGDP}_{t-i} - \sum_{i=0}^{p} \hat{\delta}_{2i} \text{lnM2}_{t-i} - \sum_{i=0}^{p} \hat{\delta}_{3i} \text{lnDC}_{t-i} \quad (9)$$

In this case the parameter λ represents the speed of adjustment for short-run to reach in the long-run equilibrium. The long-run and also the short –run elasticities of PGDP with respect to M2, and DC are given below in Tables (3) and (4)

Table 3: ARDL Coefficients for Long-Run

Dependent Variable lnPGDP Long-run Elasticities	Coefficient	t-Test	Probability
Constant	-0.2095	-2.1650	0.03875
lnM2	0.1251	2.0843	0.04605
lnDC	-0.0366	-0.7478	0.46062

Table 3 shows that there is a positive relationship between M2 and economic growth, the relationship is significant at 5% level of significance. It can be concluded that a 1% increment in M2 that leads to increase real income by 0.1251% in the long-run. But in

case of domestic credit (DC) it is found that DC is negatively related with economic growth in the long-run but not statistically significant at all.

Table 4: Error Correction Model:

Dependent Variable (Δ lnPGDP) Short-run Elasticities	Coefficient	t-Test	Probability
Constant	0.0132	1.4893	0.14801
Δ lnM2	0.0641	1.3358	0.19276
Δ lnDC	-0.0195	-0.5246	0.60413
ECM{-1}	-0.9019	-4.1903	0.00026
Sensitivity Analysis	The Short-run Diagnostic Test Results		
LM Test for Autocorrelation	1.5724		0.20986
ARCH Test	2.2696		0.13193
LM test for Heteroscedasticity	1.1294		0.76997
F-test for Functional form Misspecification	2.9734		0.09567
JB Test for Normality of Errors	1.4185		0.49201

The error correction mechanism (ECM) is employed to check the short-run relationship among PGDP, M2 and DC. Table (4) shows that the coefficient of ECM (-1) is statistically significant at any significance level which indicates that there is a short-run relationship among the variables. The error correction term is statistically significant and its' magnitude is quite higher indicates a faster return to equilibrium in case of disequilibrium. The coefficient of ECM (-1) is -0.9019 with the expected sign, suggesting that when per capita income level is above or below its equilibrium level it adjusts by almost 90.19% within the first year. The full convergence process to its equilibrium level takes about 1.11 years. Thus the speed of adjustment is significantly faster in case of any shock to the economic growth equation. The long-run elasticity of economic growth with respect of M2 (0.1251) is higher than short-run elasticity of 0.0641. This means over time higher money supply gives rise to more economic growth in Bangladesh. Thus it can be said the new policy which is formulated by the Bangladesh Bank regarding contraction of money supply will be very harmful for economic growth in case of Bangladesh economy.

Sensitivity Analysis: Diagnostic tests for serial correlation, autoregressive conditional heteroscedasticity, heteroscedasticity, functional form misspecification and non-normal

errors are conducted and the results are reported in Table (4). The test results indicate that there is no evidence of serial correlation, because the functional form is well specified and there is no problem of heteroscedasticity. Also the autoregressive conditional heteroscedasticity is not present in the short-run model.

3.3 Granger Causality Test

The cointegration relationship indicates the existence of causal relationship between variables but it does not indicate the direction of causal relationship between variables. Therefore it is common to test for detecting the causal relationship between variables using the Engle and Granger (1987) test procedure. Since the variables X and Y are I (1), and cointegrated, the Granger causality test can be applied to I(0) data with an error correction term. The following model is appropriate to check the causality between two variables X and Y;

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \sum_{j=1}^{q} \beta_j \Delta X_{t-j} + \delta_1 ECM_{t-1} + \varepsilon_t \quad (10)$$

$$\Delta X_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta X_{t-i} + \sum_{j=1}^{q} \beta_j \Delta Y_{t-j} + \delta_2 ECM_{t-1} + \xi_t \quad (11)$$

The ECM is the error correction term, which combines short-run and long-run dynamics of cointegrated variables towards the long-run equilibrium. Here the null hypothesis to be tested is H_0: $\beta_1 = \beta_2 = ...= \beta_q = 0$; against the alternative hypothesis H_1: At least one of them is not zero. The ε and ξ are random error terms, which are serially uncorrelated with zero mean and constant variance. If the null hypothesis is rejected for equation (10), it can be said that there is a unidirectional causality from X to Y. Conversely, if the null hypothesis is rejected for equation (11) it can be said that there is a unidirectional causality from Y to X. If the null hypothesis is rejected for both equations, it can be said that there is a bidirectional causality between Y and X. They are referred to as the short-run Granger causality test. The coefficients on the ECM represent how fast deviations from the long-run equilibrium are eliminated. Another channel of causality can be studied by testing the significance of ECM's. This test is referred to as the long run causality test. The short-run and long-run Granger causality results are reported below in Table (5)

Table 5: Granger F-test results

Hypothesis	F-Test (p-Value)	ECM	Conclusion
1. PGDP and M2			
M2 does not Granger cause PGDP	4.2232*	-4.0309*	M2 → PGDP
	(0.0487)	(0.0004)	
PGDP does not granger cause M2	0.6636	-0.3200	
	(0.4217)	(0.7512)	
2. PGDP DC			
DC does not Granger cause PGDP	0.5393	-3.5627*	
	(0.4684)	(0.0012)	
PGDP does not granger cause DC	0.0916	0.58450	
	(0.7643)	(0.5637)	
3. M2 and DC			
DC does not Granger cause M2	5.1203*	-1.6515	DC → M2
	(0.0310)	(0.1091)	
M2 does not Granger cause DC	0.0189	-1.7295	
	(0.8912)	(0.0940)	

$x \rightarrow y$ means x Granger causes y. The reported values in parentheses are the p-values of the test.

The findings in Table (5) indicate that short-run unidirectional causality running from broad money (M2) to economic growth, and from domestic credit (DC) to broad money (M2). There is no causation between DC and PGDP. Thus it can be concluded that in case of Bangladesh economy the supply-leading hypothesis could be employed but the demand-following hypothesis cannot be accepted. Also the results in Table (5) show that there is a long-run relationship between PGDP and M2 while PGDP is the dependent variable and also between PGDP and DC while PGDP is the dependent variable.

3.4 CUSUM and CUSUMSQ Tests:

Finally the stability of the long-run parameters together with the short-run movements for the equation are examined using cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests proposed by Borensztein and Ostry (1998). The related graphs of these tests are presented below in Figures 1 and 2. From Figures (1) and (2) it

can be seen that the CUSUM and CUSUMSQ tests results are within the critical bounds implying that all coefficients in the error correction model are stable. Therefore the preferred economic growth model can be used for policy formulation, such that the impact of policy changes considering the explanatory variables of economic growth equation will not cause major distortion in the level of economic growth, since the parameters in this equation seem to follow a stable pattern during the estimation period.

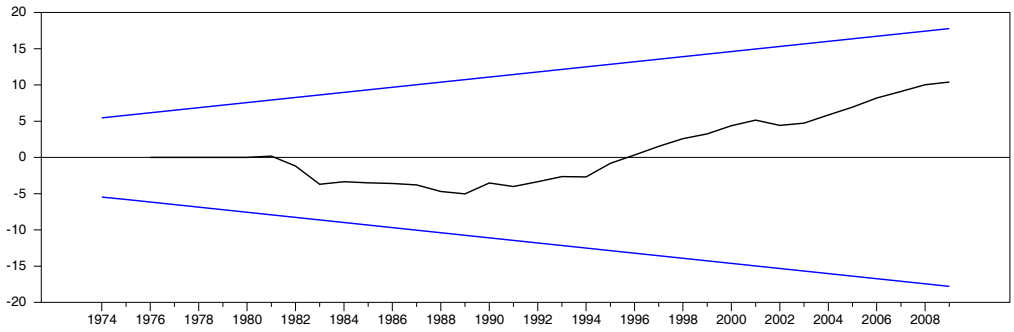

Figure 1: Plot of Cumulative Sum of Recursive Residuals

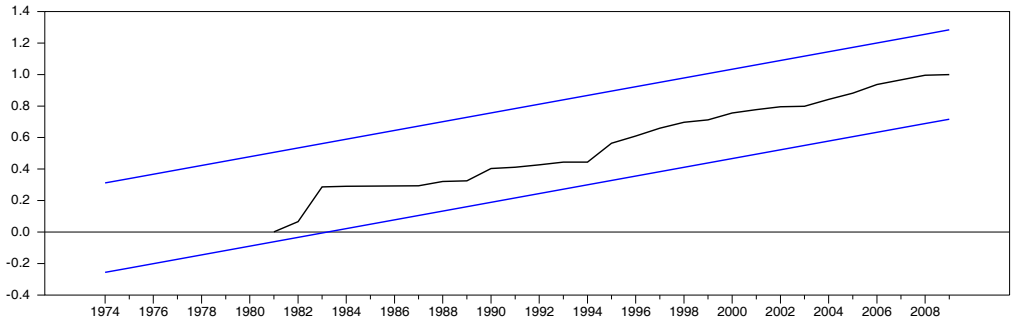

Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level both in Figure 1 and 2

4. Conclusion

This paper attempts to investigate empirically the supply-leading or demand-following hypotheses in case of Bangladesh using time series data for the period of 1974 to 2009. From the findings of this study, it can be concluded that there is a long-run association between broad money (M2) supply and economic growth whereas it does not show any significant relationship between domestic credit (DC) provided by banking sector and

economic growth in case of Bangladesh. It may be happened due to the fact that financial restructuring have not yet been able to boost long term growth and productive investment. It is found that the long-run elasticity of economic growth with respect to M2 (0.1251) is higher than short-run elasticity (0.0641). This means over times higher money supply gives rise to more economic growth in Bangladesh. Thus it can be concluded the new policy which is formulated by Bangladesh Bank regarding contraction of money supply will be very harmful for economic growth in case of Bangladesh economy. Diagnostic tests results indicate that there is no evidence of serial correlation, because the functional form is well specified and there is no problem of heteroscedasticity. Also the autoregressive conditional heteroscedasticity is not present in the short-run model. The Granger F-test results show that short-run unidirectional causality running from broad money (M2) supply to economic growth and from domestic credit (DC) to broad money (M2). There is no causation between DC and PGDP. Thus it can be concluded that in case of Bangladesh economy the supply-leading hypothesis could be employed but the demand-following hypothesis cannot be accepted. Also the results in Table (5) show that there is a long-run relationship between PGDP and M2 while PGDP is the dependent variable and also between PGDP and DC while PGDP is the dependent variable. The CUSUM and CUSUMSQ tests results support that all the coefficients in the error correction model are stable. Therefore policies about economic growth can be made based on the preferred model. However the results may be somewhat different if we consider the series market capitalization or volatility. The results suggest that financial system based on capital market is powerful promoter of domestic economy than bank based ones (Arestis et al. 2001). Thus from the findings it can be concluded that the new policy which is formulated by central bank of Bangladesh for contraction money supply to control the inflationary rate, will be harmful for economic growth in Bangladesh.

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