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Analyzing the Trend of Private Sector Credit in Bangladesh: Do Loose Monetary Policy and GDP Growth Matter?

Mintu Barua[1]

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Abstract

This study tries to explore the influence of monetary expansion and GDP growth on the private sector credit in Bangladesh in the framework of Auto Regressive Distributed Lag (ARDL) bound testing technique by utilizing the annual time series data for the period of 1980 to 2019. The long-run estimates of ARDL model reveals that although monetary expansion enhances the private sector credit flow, economic growth has very negligible influence on the flow of domestic credit to the private sector due to corruption, political intervention and structural weakness of financial sector in Bangladesh. Granger causality test also confirms the success of loose monetary policy in credit expansion. Finally, it is worthy to be mentioned that a loose monetary policy is inevitable for an unwavering private sector credit flow, well-being of infant industry, enhancing the investment activities and thereby strengthening the capital formation in Bangladesh. This study calls for adopting the reformation of central bank, money market, policy rate, formal and informal agencies of credit distribution as well as confirming an investment friendly environment which motivate the private sector credit flow and lead Bangladesh to reach its highest possible stage of success.

Keywords: *Private Sector Credit, Broad Money Supply, GDP Growth, ARDL, Bangladesh*
JEL Classification: *C22, E51, G24*

[1]Lecturer, Department of Economics, Begum Rokeya University, Rangpur
Email: mintu.eco@brur.ac.bd

1. Introduction

Confirming the higher living standard for people is a vital activity for the government as well as for the ruling party of a country. Higher living standard of people is a result of continuous growth of economy. In order to get a sustainable growth of a country, the financial sector needs more and more priorities. The developed financial sector confirms the development of an economy (Biplob and Halder, 2018). In case of several developing countries, private sector is considered to be a vital element of financial sector. Due topolitical, administrative and bureaucratic difficulties in public sector of developing countries, private sector seeks more priority. More investment in private sectors leads to more entrepreneurship, less social crime, less vulnerability, more dignity as well as stable life of citizens in the developing countries. But shortage of fund is a major hindrance in the private sector investment. Proper availability of credit can help the tiny and constrained investors to participate in the investment activity. If the firms get short-term as well as long-term credits at a lower rate of interest,that will be helpful for increasing the firm's productivity and capital formation by which sustainable growth of the economies can be made possible (Behr et al., 2013). According to (Cestone and White, 2003), tiny and vulnerable firms depend more on the sources of credit in order to enhance their capital formation. If the surplus amount of money gets proper channel between lenders and investors then that will be helpful for boasting investment activity of an economy. Bangladesh was known as a bottomless basket at a time. After the independence in 1971, Bangladesh experienced a negative growth rate of income which is -5.5%, a lower per-head income of $134 and about 75% of population living with extreme poverty. After a decade, GDP has grown to a rate of 3.8% but due to higher growth of population, there was still a lower level of per-head income. Because of this unexpected experience, government of Bangladesh started to give priority on private sector investment and investment from foreigners. By the (Foreign Private Investment Act, 1980), the government of Bangladesh opened a new horizon on the way of private sector development. By dint of the increasing investment in the private sector, Bangladesh started to make higher amount of income from Readymade Garments (RMG) sector after1980. Moreover, spinning and textiles were also related to the success story of Bangladesh (Abdin, 2020). The increase in credit of private sector enhances GDP growth in Bangladesh (Paul, 2020). If domestic private sector credit is used efficiently then economic growth can be boosted otherwise it impedes the economic performance of Bangladesh (Siddikee and Rahman. 2021). That means, the domestic private sector credit works like an engine of growth. But Bangladesh economy faces the problem of shortage of credit, inefficient banking system, inefficiency in the allocation of credit and weakness in the proper channeling between credit and investment. To solve these emerging problems,

several macroeconomic factors of private sector credit gain considerable attention. In Bangladesh, some authors have carried out investigations to represent the influence of overall progress in financial sector on the growth of economy. Only one study reveals the factors of domestic bank credit which is a very small portion of domestic private sector credit in Bangladesh. No study tries to search the impact of monetary expansion as well as GDP growth on the flow private sector credit. That's why the study tries to explore the connection of loose monetary policy and GDP growth on the flow of private sector credit in Bangladesh. This work has a few objectives which are given below:

- For checking the long-run relevance as well as short-term causal connection of domestic private sector credit with broad supply of money and GDP.
- To critically evaluate the success of monetary policy of Bangladesh Bank in influencing the private sector investment and aggregate economic performance of Bangladesh.
- To illustrate the present trend of private sector credit in Bangladesh.

After the fulfilment of the aforementioned objectives, the study will aid the researchers, policymakers andBangladesh government to a great extent. This research work will assist the new researchers to explore more about the domestic private sector credit for confirming a sustainable economic development of Bangladesh.

2. Review of Relevant Literature

The financial sector has a close connection with the private sector in several developing countries. According to (Kamal & Hossain, 2023), non-performing loans and commercial banks loan to the government have negative influence where deposits enhance private sector credit in Pakistan. The outcome represents the veryweek effect of expansionary monetary policy of Pakistan on increasing the credit of private sector. Inadequate credits, higher cost of importing capital goods, rising cost of investment, payment for the higher amount of foreign loan lower the volume of Gambia's private sector investment level (Ayeni, 2020). Loose monetary policy enhances the volume of private sector credit where rate of inflation, GDP as well as interest rate don't have expansionary impact on domestic private sector credit (Mukuka, 2019). The inflation rate, rate of lending and increase of per-head income enhance bank credit through which the consistent increase in investment and further well-being of economy be made possible in Tanzania (Kilindo, 2020).

From the independence in 1971, there are various challenges faced by Bangladesh. For boosting the aggregate income of Bangladesh, higher volume of investment is required. In Bangladesh, a large portion of investment is private

sector investment. For boosting private sector investment, available credit to the private sector is a monumental issue. To the best of author's knowing, some authors have contributed in a few studies associated to the private sector credit in Bangladesh. If there exists a proper flux of credit in agricultural sector, the farmers will be more productive through which sustainable economic development will be made possible (Alauddin & Biswas, 2014). Due to the higher non-performing loan, more credit risks appear to be present which lead the lower volume of credit in the private sector of Bangladesh (Ashikuzzaman, 2022). More money supply and more income lead to strengthening the credit volume in the several banks of Bangladesh (Islam, 2022). Domestic bank credit only includes the credit flow from formal banking channel where domestic credit to private sector includes the credit flow from formal, semi-formal as well as informal sources in Bangladesh. That's why domestic private sector credit is considered to be broader concept than formal bank credit. According to the knowledge of author, no investigation has shown the influence of loose monetary policy as well as GDP growth on the broader measure of domestic private sector credit in Bangladesh. By considering this research gap, the author gets the enthusiasm for carrying out the current study.

3. Methodology

3.1 Specification of the Model:

The exploration aims to reveal the connection of broad money and GDP growth with the domestic private sector credit in Bangladesh.A theoretical model of the study can be:

$$DC_t = f(BM_{t,}, Y_t)$$

Where BM_t and Y_t are the major independent variables and DC_t is the controlled variable of the model. To denote the time period from 1980 to 2019, the subscript t has been used. To obtain the robust results, the variable BM has been converted into natural logs. The linear regression model is specified as follows:

$$DC_t = \beta_0 + \beta_1 LnBM_t + \beta_2 Y_t + \in_t$$

Where,

DC_t= Domestic Private Sector credit, $LnBM_t$= Log of Broad supply of Money

Y_t= Gross Domestic Product,β_0= Intercept,

$\beta_{1/100}$= The absolute change in the domestic private sector credit due to 1% alteration in the broad supply of money and β_2= The slope coefficient which shows the absolute change in domestic private sector credit due to one unit change in GDP.

ε_t= Stochastic Error Term

β_1 and β_2 are expected to be non-negative.

3.2 Data and Variables

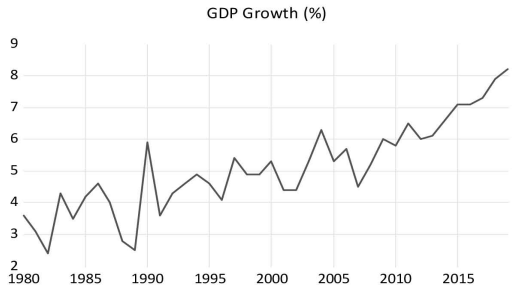
The annual data of time series nature from 1980 to 2019 have been utilized in this study. The rationale for taking the shorter period data is that there is no break in the availability of data for 1980 to 2019 in World Development Indicator.The dataset has the following facts:

Table 1: Sources of Data of the Variables

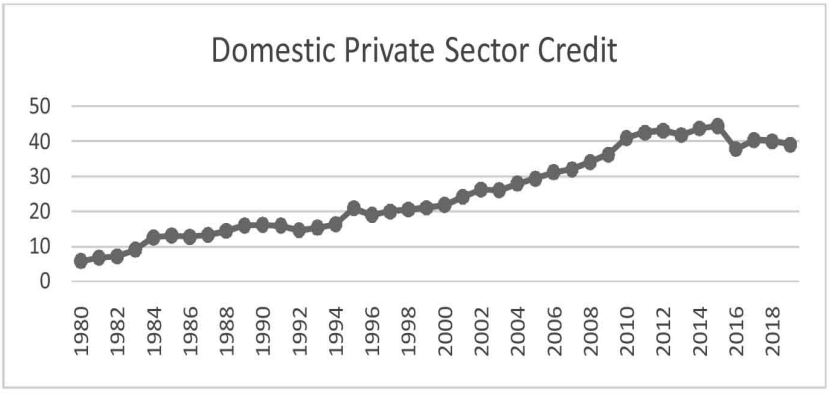
Variables	Notation	Data Source
Gross Domestic Product	Y	World Development Indicator (WDI), WB.
Broad Money (Logarithmic Form)	LnBM	World Development Indicator (WDI), WB.
Domestic Private Sector Credit	DC	World Development Indicator (WDI), WB.

The rationaleof the variables selected in this analysis are given as follows:

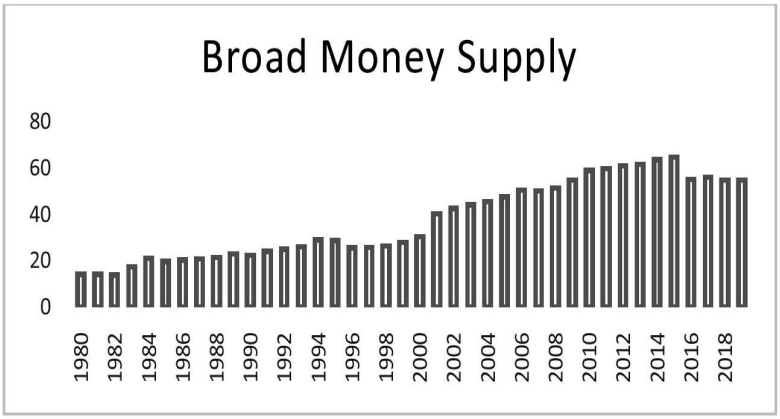
For measuring the economic well-being of a country, GDP is a superior way. The monetary measure in the valuation of produced goods as well as services is represented by nominal GDP. As all variables in this study follows the nominal measurement, nominal GDPis used here. Several studies such as Tasneem (2023), Misini and Patina (2017), Dragusha et al. (2023) utilize the proxy to indicate the economic growth. As private sector credit is very effective tool to boost the investment activity and capital formation, domestic private sector credit is utilized for measuring thecredit sector's efficiency. Some studies such as Biplob and Halder (2018), Hassan et al. (2011) use this variable to represent the success of credit sector. As narrow money cannot represent the proper flow of money supply, broad measure of money is used in this study. For channeling of funds from savers to borrowers, providing transactions and enabling a better financial system, broad money plays a vital role (Khan and Senhadji,2000). Numerous studies such as Anwar and Cooray (2012), Anwar and Nguyen (2011), Giedman and Compton (2009) utilized this indicator as a performance parameter of monetary sector. The trend of the variables used in the model can be shown as follows:



Source: World Development Indicator, World Bank.



Source: World Development Indicator, World Bank.



Source: World Development Indicator, World Bank.

The study takes the help of Ordinary Least Squares (OLS) regression to check the spurious association of regressors on the regressand. The presence of spurious association among the variables leads to the utilization of unit root test in the time series regression. Because of the relative advantage and as a modern method, KPSS unit root test by Kwiatkowski-Phillips-Schmidt and Shin (1992) has been used for checking the unit root of the series. The lag order selection criteria of Vector Auto-Regression (VAR) is utilized to fix the optimal lag length. This investigation contains time series data for a short period of time. Therefore, the test statistic which suggests the minimum lag length is utilized among the several varieties such as Schwarz Information Criterion (SIC), Akaike Information Criterion (AIC), Final Prediction Error (FPE), Sequential modified

LR test statistic (LR) and Hannan-Quinn Information Criterion (HIQ). To determine the long-run connection among the series, co-integration test iscrucial. Several co-integration procedures such as Johansen-Juselius (1990), Engle-Granger (1987), Phillips and Hansen (1990) have various disadvantages and these are not free from criticism. Due to the small size of sample as well as acombination of both I(1) and I(0) series, the Auto Regressive Distributed Lag (ARDL) bound testing technique by (Pesaran et al., 2001) is considered to be better than other co-integration approaches in this study. In this study, the normal form of ARDL regression analysis is:

$$DC_t = \beta_0 + \beta_1 DC_{t-1} + \delta_0 LnBM_t + \alpha_0 Y_t + \alpha_1 Y_{t-1} + \delta_1 LnBM_{t-1} + \varepsilon_t$$

Where ε_t is used to represent a stochastic error term. If ARDL bound testing approach indicates a co-integrating connection among the series, then long-run level model reveals the connection among the series in the long-run. The long-run level model can be written as:

$$DC_t = \beta_0 + \beta_1 LnBM_t + \beta_2 Y_t + \in_t$$

To identify the adjustment speed of this model from short-run disequilibrium to long-run equilibrium, the estimation of a different restricted Error Correction Model (ECM) is crucial.

The restricted ECM equation can be given as follows:

$$\Delta DC_t = \beta_0 + \sum \beta_i \Delta DC_{t-i} + \sum \gamma_j \Delta LnBM_{t-j} + \sum \delta_m \Delta Y_{t-m} + \varphi EC_{t-1} + e_t$$

Where φ represents the adjustment speed to long-run due to a short-run shock and EC_{t-1} is considered as error correction term. After checking the long-term and short-term association among the series, the Granger Causality technique by Granger (1969) is employed in this work to identify which is cause and which is effect in the derived relationship. Several relevant diagnostic checking namely test for autocorrelation, heteroscedasticity, normality and stability have to be carried out to check whether the estimated regression results are valid and reliable or not.

4.Analysis of the Empirical Findings

The results and discussions of the work are contained in this part.The summary of descriptive statistics has been shown in Table 2.

Table 2: Descriptive Statistics

	DC	*Y*	*LnBM*
Mean	*24.81565*	*8.60E+10*	*3.512813*
Median	*21.38331*	*5.23E+10*	*3.392570*
Maximum	*44.40697*	*3.51E+11*	*4.166767*
Minimum	*5.771342*	*1.76E+10*	*2.643161*
Std. Dev.	*12.05358*	*8.74E+10*	*0.481306*
Skewness	*0.222679*	*1.744461*	*−0.187165*
Kurtosis	*1.718754*	*5.111835*	*1.704482*
Jarque-Bera	*3.066557*	*27.72071*	*3.030815*
Probability	*0.215827*	*0.000001*	*0.219719*
Observations	*40*	*40*	*40*

Source: Estimation of Author Using Eviews 10

According to the descriptive analysis, the distribution of all variables except Y are normal. The series DC and Y have positiveskewness where LnBM is negatively skewed variable. All the variables except Y follows a platykurtic distribution but Y follows a leptokurtic distribution. Analysis of correlation determines the severity of linear connection between the variables.

Table 3: Correlation Analysis

Variables	*DC*	*Y*	*LnBM*
DC	*1*	*0.7831*	*0.9728*
Y	*0.7831*	*1*	*0.7080*
LnBM	*0.9728*	*0.7080*	*1*

Source: Estimation of Author Using Eviews 10

Table 3 illustrates the pair-wise correlation analysis of the variables. All variables have positive correlation with each other. Here, explained variable DC is highly positively correlated with explanatory variables Y and LnBM. This indicates a good sign for further analysis in the model which is specified in this work. As there exists moderate correlation between two regressors, there is no multicollinearity problem. Table 4 represents the estimated results derived from OLS regression analysis. As the probability value of F-statistic is less than 0.01, the overall model is fitted well. The value of R^2 and adjusted R^2 is almost equal to one which indicates the relevance and strong theoretical ground of the variables used in this model. As the magnitude of R^2 is higher than the Durbin-Watson statistic, there is a dubiety of spurious regression according to the rule of thumb of (Granger & Newbold, 1974). Therefore, it is necessary to search for the co-integrating association among the series.

Table 4: Results of OLS Estimates of semi-log model

Variables	Coefficients	Standard Error	t-statistic	P-value
C	-51.22691	3.541551	-14.46454	0.0000
Y	2.61E-11	6.07E-12	4.297981	0.0001
LnBM	21.00849	1.102371	19.05754	0.0000

Note: $R^2 = 0.9642$, *Adj-*$R^2 = 0.9623$, $Fstatistic = 498.9087\,, p < 0.01, DWStatistic = 0.5387.$

Source: Estimation of Author Using Eviews 10

The KPSS unit root test by (Kwiatkowski, Phillips, Schmidt and Shin, 1992) is employed to check the stationarity of time series. The null as well as alternative hypotheses of the unit root test are given in the followings;

H_0: Series is stationary

H_1: Series is not stationary

The unit root test's results are presented as follows:

Table 5: KPSS Test Results

Variables	*KPSS Test Statistic in Level*	*KPSS Test Statistic in 1st Difference*	*1% Critical Value*	*Decision*
DC	*0.743181*	*0.143049*	*0.739000*	*I(1)*
Y	*0.641700*	-	*0.739000*	*I(0)*
LnBM	*0.749874*	*0.204800*	*0.739000*	*I(1)*

Source: Estimation of Author Using Eviews 10

According to the decision rule of KPSS test, the order of integration among the variables is mixed which implies that the variables can be estimated through utilizing ARDL technique. To check the relationship and apply the cointegrating technique, optimal lag length of VAR model has to be selected properly.

Table 6: Lag Order Selection Criteria in VAR

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	*-1106.114*	*NA*	*4.51e+21*	*58.37443*	*58.50371*	*58.42043*
1	***-932.9659***	***309.8443****	*8.00e+17*	*49.73505*	***50.25218****	***49.91904****
2	*-923.0516*	*16.17598*	***7.71 e+17****	***49.68692****	*50.59191*	*50.00891*

Source: Estimation of Author Using Eviews 10

In accordance with the lag order selection of VAR, most of the criteria suggest the maximum lag length of 1. It is also stated that more than 1 lag should not be used in case of a time series containing small size of sample (Johansen and Juselius, 1990). In order to check the cointegrating connection among the series, ARDL bound testing technique can be utilized according to the methodology of (Pesaran et al., 2001).

Table 7: The Outcome of ARDL Bounds Test

Critical Values	*F-statistic: 11.87517*	
	Lower Bound I(0)	*Upper Bound I(1)*
1%	*4.13*	*5.00*
2.5%	*3.55*	*4.38*
5%	*3.10*	*3.87*
10%	*2.63*	*3.35*

Source: Estimation of Author Using Eviews 10

The critical value of upper bound is lower than the value of F-statistic found in ARDL bound test when the level of significance is 0.01, 0.025, 0.05 and 0.10 respectively. This reveals the long-run connection among the series used in this model. The empirical findings of long-run association are pictured in Table 8.The long-run equation for this semi-log model is:

DC_t= - 64.1428+ 26.0790 $LnBM_t$ + 0.0000 Y_t
The obtained error correction term can be written as:
EC= DC_t- (26.0790 $LnBM_t$+ 0.0000 Y_t- 64.1428)

The Level Equations from ARDL model			
Explained Variable: DC			
Variables	*Coefficients*	*t-statistic*	*Probability*
Constant	-64.1428	-5.685087	0.0000
LnBM	*26.0790*	*3.822468*	*0.0000*
Y	*0.0000*	*1.691118*	*0.1000*
R-squared= 0.987484	*Durbin-Watson statistic= 1.671595*		
Adjusted R-squared= 0.986012			

Source: Estimation of Author Using Eviews 10

Table 8 shows that an increase in broad supply of money by 1% leads the domestic private sector credit to be increased by 0.26079 unit in the long-run, which has statistical significance at 1% level. But the Gross Domestic Product has no long-run influence on domestic private sector credit. As the Durbin-Watson statistic is more than theR^2, the estimated results in the model are not spurious in accordance with the Granger and Newbold (1974). The error correction model represents the adjustment speed from short-run disequilibrium to long-run equilibrium.

Table 9: The Results of Short Run Error Correction Model

ECM-ARDL			
Dependent Variable: DC			
Variables	*Coefficients*	*t-statistic*	*Probability*
D(Y)	*-0.0000*	*-5.3629*	*0.0000*
ECT_{t-1}	*-0.237624*	*-7.1897*	*0.0000*
R-squared= 0.509088		*Durbin-Watson statistic= 1.671595*	
Adjusted R-squared= 0.495820			

Source: Estimation of Author Using Eviews 10

Table 9 indicates that the $ECT_{t-1}$is negative and significant statistically when the confidence level is 0.99. If Domestic Private Sector Credit (DC) deviates from long-run equilibrium path due to a shock, that will be corrected with 23.76% speed annually. In this analysis, there is no particular short-run influence of regressors on regressand. Granger causality technique ascertains the causal connection between the series.

Table 10: Pairwise Granger Causality Test Results

Null Hypothesis	*Probability*	*Decision*	*Direction of Causality*
Y does not Granger Cause DC	*0.3596*	*Accept*	*No Causality*
DC does not Granger Cause Y	*0.1802*	*Accept*	
Y does not Granger Cause LnBM	*0.4421*	*Accept*	*No Causality*
LnBM does not Granger Cause Y	*0.3418*	*Accept*	
LnBM does not Granger Cause DC	*0.0211*	*Reject*	*Unidirectional Causality LnBM→DC*
DC does not Granger Cause LnBM	*0.4223*	*Accept*	

Source: Estimation of Author Using Eviews 10

Table 10 indicates the causal connection from broad money supply to domestic private sector credit. For properly maintaining the several properties of Classical Normal Linear Regression Model (CNLRM), the validity and relevance of the regression outcomes has to be checked.

Table 11: Breusch–Pagan–Godfrey Heteroskedasticity Test

F-statistic	*0.746428*	*Prob. F(4,34)*	*0.5672*
*Obs*R-squared*	*3.148319*	*Prob. Chi-Square(4)*	*0.5333*
Scaled explained SS	*2.666127*	*Prob. Chi-Square(4)*	*0.6152*

Source: Estimation of Author Using Eviews 10

Table 11 indicates that null hypothesis of Homoskedasticity cannot be rejected when the confidence level is 95%. It is the proof of homoskedastic residuals in the model. If there is no serial correlation among the residuals then it can be stated that the time series analysis has goodness of fit (Ozkan, et al, 2018).

Table 12: Serial Correlation LM Test

F-statistic	*0.995459*	*Prob. F (1,33)*	*0.3257*
Obs R-squared*	*1.142003*	*Prob. Chi-Square (1)*	*0.2852*

Source: Estimation of Author ByEviews 10

According to the results of Table 12, the residuals are not correlated serially at 5% significance level. The structural stability of the parameters estimated in the ARDL model has to be checked.As the plot of Cumulative Sum of Recursive Residuals (CUSUM) stays within the 0.05 critical bound, it can be stated that structural break does not exist in this model. For confirming the validity of regression result, normality test plays a vital role.

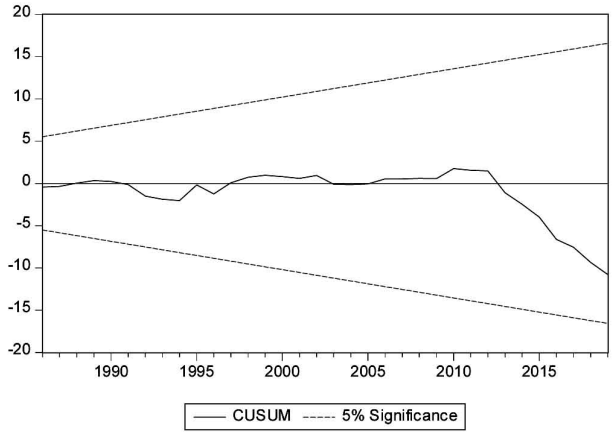


Figure: Plot of CUSUM Test, *Source: Author's Estimation Using Eviews 10*

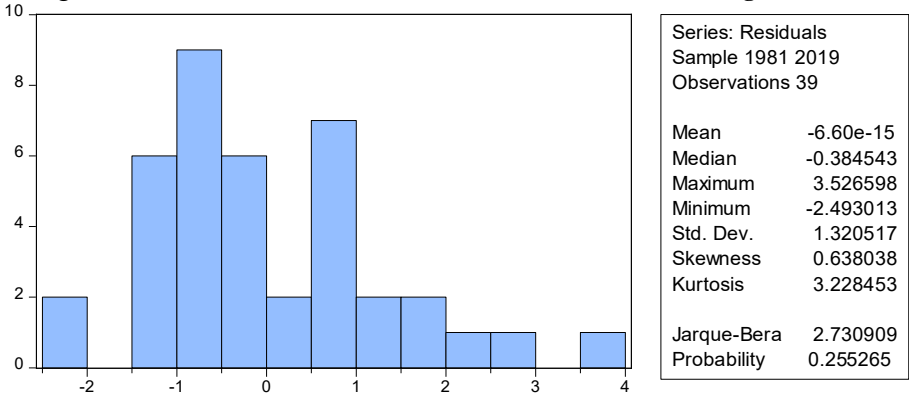


Figure: Histogram of Normality Test and Jarque-Bera Test Statistic
Source: Estimation of Author Using Eviews 10

According to the results of Jarque-Bera test, the assumption of the normality of residuals cannot be rejected when the significance level is 0.05.

5. Conclusions and Policy Recommendations

Increasing capital formation through enhancing the investment activity is a blazing question in a country. In that case, source of investment is a vital issue. From the independence of Bangladesh and till now, private sector credit has been considered as an important source of financing in business activity. To enrich the economy of Bangladesh, the appropriate mechanism of boosting private sector credit has to be investigated. According to the long- run level equation of the

study, broad money supply has expansionary and statistically significant impact on private sector credit. Loose monetary policy confirms more money in the circulation of the economy. Due to more money supply, lenders in the private sector gains more ability to provide loans to the potential investors. According to the familiar IS-LM model, monetary expansion leads to the outward shift of LM curve which alters the money market equilibrium and lowers the interest rate. As a result, keeping money to the bank account or financial investment is less lucrative than employing the money in physical investment project. That means loose monetary policy confirms the higher availability of credit and higher capital formation in the private sector. This finding is consistent with several studies like Mukuka (2019), Amponsah et al. (2019) and Batu (2016). In this study, there is almost negligible influence of GDP growth on domestic private sector credit. Traditionally it is believed that, at the initial stage of growth in an economy, there exists an excess demand for private sector credit or several financial services. Due to the excess demand, credit sector tends to grow (Younus, 2012). But this finding of the study is inconsistent with that conventional thought. In Bangladesh, the influence of income growth is negligible on private sector credit due to the establishment of bank by political consideration, lending aggressively, indifference to banking regulations, non-performing loans and weakness in the management of banking (The Daily Star, 2018). Besides, too much political intervention in the distribution of credit, corruption of the officials in the credit sector are also responsible for lower growth of private sector credit in Bangladesh (The Daily Star, 2024). This result is consistent with Mukuka (2019). The Error Correction Term (ECT) derived from the Error Correction Model (ECM) reveals the further proof of long-term equilibrium connection among the series. In this work, domestic private sector credit does not only include the private sector credit by banking sector but also include the credit by semi-formal as well as informal sectors, credit from local money lenders and from village lenders. GDP growth doesn't mean the growth of credit from all of these sources due to income inequality. Due to short-span of time, both GDP growth and loose monetary policy don't have any vital dominance on private sector credit in Bangladesh in the short-run. Finally, the researcher recommends some policies to be implemented**:**

- The government should focus on the stable monetary expansion which helps to attain higher private sector credit and moderate rate of inflation.
- Corruption and political intervention should be removed from credit sector.
- Implementation of excessive interest rates should be discouraged so that more private sector credits are available for physical investment.
- The concerned authorities should take necessary steps to confirm an equitable distribution of income.

This research work looks for the determining factors of private sector credit in Bangladesh with highest care. But there exists, some limitations in this investigation. As, this is a quantitative study, several social, historical and qualitative factors are not taken into consideration. The use of Jarque-Bera statistic for a small sample size can also be considered as a limitation for this study. Moreover, no primary data has been used in this work. The initiative of further research can be undertaken by incorporating several qualitative determinants of private sector credit and by utilizing the appropriate primary data sources.

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