

Impact of Profitability, Liquidity, Credit Risk, and Operating Efficiency on the Bank's Performance in Bangladesh

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ABSTRACT

The primary goal of this study is to investigate the several risk aspects of Bangladesh's banking industry, including credit risk, liquidity, profitability, and operational efficiency. A sample of thirty banks operating in Bangladesh was chosen for this specific objective. Among the banks, twenty are privately owned commercial banks, the state commercially owns four, and foreign entities own six. The analytical study was performed on data gathered from 2013 to 2019. The independent variables were capital adequacy, net interest margin, nonperforming loans, and return on assets. Instead, the loan-to-deposit ratio was examined. Correlation, analysis of variance, and multiple linear regression were used to examine dependent-independent variable relationships. According to data research, the Loan to debt ratio, capital adequacy ratio, asset return rates, and net interest margin are positively correlated. Nonperforming loans mostly lower loan-to-deposit ratios. The independent factors provide a 37.5% explanatory power for the dependent variable. Future studies are possible since the remaining 62.5% can be attributed to variables not considered in this analysis.

1. INTRODUCTION

Any economic system's financial foundation is thought to be provided by banks. It is crucial to transfer funds from the surplus to the deficit unit (Mishkin, 2019). Bangladesh primarily has two kinds of banks: scheduled banks and nonscheduled banks. There are currently 62 scheduled banks in Bangladesh, and they are divided into several groups, including public limited banks, foreign banks, specialized banks, and private commercial banks (Bangladesh Bank, 2021).

Bangladesh's commercial banks deal with issues comparable to those in the rest of the developing world. This study aims to assess the credit risk, profitability, liquidity, and operational performance of commercial banks in Bangladesh. The bank is the lifeblood of an economy's financial institutions and moves funds from surplus to deficit units. This business ensures a country's economic progress by properly allocating cash (Madura, 2018). The stock exchanges in Dhaka and Chittagong of Bangladesh rely heavily on the banking industry.

The term nonperforming loan is the outcome of credit risk, and credit risk means that the borrower will be the failure to repay the money on time. Nonperforming loans are financial assets banks have failed to collect any interest or installments in Bangladesh's banking industry (Mishkin, 2019). It is a critical factor in the banking industry and has gradually become a concern in Bangladesh.

Investor confidence will decline as the nonperforming loan ratio rises, driving away creditworthy borrowers from the banking system. In recent years, the number of nonperforming loans has increased alarmingly. The main causes of this include unlawful interruptions of the concerns, fraud, and political involvement. In 2015, there were Tk.546.57 billion nonperforming loans in Bangladesh (The Financial Express, July 21, 2020). During the previous decade, the sum was virtually half. During the last eight years, the default rates for state-owned commercial banks have been over 50% higher than those for private commercial banks (Bangladesh Bank, 2018).

A higher amount of nonperforming loans is a bad sign for an economy since it reduces the quantity of money that can be recycled, resulting in economic stagflation. It will also have a detrimental impact on the bank's profits. Nonperforming loans disrupt the regular operation of the capital adequacy ratio, lowering the return on investment while raising capital costs (Rose, 2016).

2. LITERATURE REVIEW

Lata R. S. found that bank loan decisions affect profitability and long-term viability. Due to a focus on nonperforming loans, banks have been more careful about problematic lending. Industrialized, developing, and poor nations face these difficulties (Lata R.S. 2015). Nonperforming loans are largely affected by macroeconomic shocks, bank size, risk appetite, and credit risk. The panel regression model shows that credit length is a prominent variable and that the projected coefficient of the cost of credit swings when the anticipated interest rate is positive. However, persistent economic growth reduces nonperforming loans (Rajan & Sarat, 2003). The loan-to-deposit ratio is a standard measure of banking intermediation. Buchory determined in 2014 that the ratio shows a bank's fund management efficiency. A higher ratio indicates better cash transmission by the bank (Buchory, H.A. 2014).

Adhikari (2008) researched the topic. He found that public and private commercial banks face difficulties managing nonperforming loans. He also highlighted in his research that these banks need help keeping insufficient loan loss provisions. There are two reasons for this: a lack of legal implementation and insufficient debt collection methods.

Beaver (1966) examined one financial ratio to predict insolvency. Altman (1968) used numerous discriminant analyses to get the same conclusion with many ratios. It's Altman's Z-score model. This model's ratios couldn't account for industry-specific health guidelines. Maishanu (2004) solved this. He proposed eight financial ratios to evaluate a bank's health.

According to Ganesan & Santhanakrishnan's (2013) research, a bank's profitability will rise if its non-performing loans (NPL) are managed well. According to a study by Sameer & Kamra (2013), non-performing loans (NPLs) caused emotional and financial suffering for banks and institutions in the same year. They recommended identifying the defaulters to remember the money for the bank's expansion.

According to a different study conducted by Michael et al. (2006), non-performing loans (NPLs) harm a bank's solvency, liquidity position, and return. One explanation for that has been suggested: decreasing operating efficiency. Because these institutions are concerned about survival, non-performing loans (NPLs) should be given more weight.

Panta (2007) claimed that most banks are trying to maintain NPLs and increase profitability after the 1992 banking sector reforms. Banks also consider RBI asset classification, income recognition, and other rules. Panta (2007) found

a global link between NPAs and bank collapse. Tracey (2011) studied the same topic. According to his research, bank loan decisions vary per client based on ratios. They ration credit for hazardous clients to avoid bad loan selection during a recession.

Haneef and Riaz (2012) investigated the causes of nonperforming loans and devised a list of factors. Their research concluded that improper risk management leads to a rise in nonperforming loans. To reduce these loans, they advised banks to follow the criteria of central banks in their study. According to their research, banks should change their credit policies depending on these criteria to reduce nonperforming loans (Haneef, S. & Riaz, T. 2012).

Almazari (2018) examined the variables influencing banks' profitability in Jordan and Saudi Arabia as part of his research. While some liquidity metrics correlate negatively with bank performance, others correlate favorably. He assessed the bank's performance based on four criteria—profitability, liquidity, capital, and efficiency (Almazari, A. A. 2018).

Tandon et al. carried out studies in the same area in 2019. His study concentrated on the macroeconomic factors unique to banks that affect nonperforming loans and how they affect bank profitability. A sample of thirty-five public and private banks was employed. He concluded that a greater focus on NPL management is necessary to boost profitability using a multivariate approach (Tandon, D., Chaturvedi, A. & Vidyarthi, H., 2019).

Based on the above, most investigations documented the bank's loan-to-debt and nonperforming loan ratios. This research fails to explain banks' nonperforming loan returns. Writers produce diverse results simultaneously. Jewel and Roksana (2018) compared. Only Dhaka Stock Exchange (DSE) banks were examined, and the results were similar. Only the Dhaka stock market has enlisted institutions that may only represent part of Bangladesh's banking industry. Thus, this effort seeks practical applicability. This study examines how profitability, liquidity, credit risk, and operating efficiency affect Bangladesh's banking sector (Jewel, K. R. & Roksana, A., 2018).

An analysis carried out in 2024 on Bangladesh's first—and second-generation banks reveals that Second-generation banks exhibited dramatically superior overall performance compared to the first-generation. First-generation banks might shift their focus towards enhancing operational efficiency to reduce costs and ultimately achieve profitability in the long term.

Another study conducted in 2021 on non-banking financial institutions (NBFIs) recommends that NBFIs consider loan selection more and enhance their brand image by offering more efficient services. Furthermore, it suggests that NBFIs identify other revenue-generating sectors to improve their

competitiveness. In the upcoming years, Non-Banking Financial Institutions will have increased opportunities that will guarantee our nation's economic progress.

An analysis conducted in Kenya in 2024 proposes that commercial banks should prioritize maintaining a robust capital adequacy ratio as an essential element of their liquidity management strategy to enhance banking efficiency. Financial institutions should establish a close partnership with regulatory bodies to guarantee adherence to capital adequacy standards while also contemplating using voluntary capital buffers to improve their financial robustness.

Studies conducted in 2024 revealed that interest rates and bank size had a favorable and considerable impact on stabilizing banks' capital. The quantity of market financing exhibits a positive correlation with capital, but bank risk and the GDP exhibit a negative correlation with banking capital.

2. OBJECTIVES

This study's primary goal is to ascertain how Bangladeshi banks' performance is affected by profitability, liquidity, credit risk, and operational efficiency. The following are the study's particular goals:

- a. To analyze the current state of nonperforming loans and assess the position, capital adequacy, and profitability of the selected banks in Bangladesh.
- b. To provide some remedial measures to overcome this issue.

4. METHODOLOGY

4.1 Data Collection Sources

This sample lists twenty private commercial banks on the Dhaka Stock Exchange. Six foreign and four state-owned banks do business in Bangladesh, although none are listed on the Dhaka Stock Exchange. The study extensively used secondary data, and the results will be published on the Bangladesh Bank website and in the bank's annual report.

4.2 Sampling Design and Sample Size

Information from banks about credit policies, nonperforming loans, and default rates is susceptible. This study investigates the impact of profitability, liquidity, credit risk, and operating efficiency on the bank's performance in

Bangladesh. It was tested on a sample of thirty bank transactions conducted in Bangladesh to obtain a reliable result. Twenty are private commercial banks, four are state-owned, and six are international banks in Bangladesh. The judgmental technique was utilized to select the banks because it allows the researcher to approach the goal directly. The research took place between 2013 and 2019.

4.3 Variable selection and justification

The variables are chosen based on the examination of the relevant literature. Initially, a broad category variable was considered to investigate the relation between the dependent variable and the causal interactions. A study was carried out gradually to ascertain the significance of each variable in connection to the independent variable. Evaluating a variable's capacity to produce an explanatory contribution to the independent variable is one of the criteria used to determine whether or not the variable should be included in the analysis. As a result of the considerable explanatory power that these four factors possess in connection to the independent variable, the technique for exclusion did not include them.

4.4 Data Processing

The research in this study is quantitative. It gauges how well Bangladesh's banking industry is doing. Electronic and manual tools were used in the analysis of the gathered data. The nonperforming loans of the chosen institutions were located using ratio analysis. The legitimacy of the finding was tested using correlation, analysis of variance, linear regression, and hypothesis testing. It was analyzed for normality problems, heteroscedasticity, multicollinearity, autocorrelation, and other traits using the presumptions of the conventional linear regression model (Gujarati, 2003).

4.5 Operational Variables

The dependent variable in this study, which evaluates the level of banking intermediation, is the Loan to debt ratio. The Loan to Debt Ratio (L/D)

is calculated by dividing total deposits by loans and advances; higher ratios indicate the banks’ enhanced efficiency. The four independent variables are the capital adequacy ratio, net interest margin, return on assets, and nonperforming loans.

Table 1: Description of Variables

Variables	Measuring unit	Symbol	Description
Dependent Variable	Loan to Debt Ratio	LDR	Loan & Advances/Total Deposit
Independent Variables	Capital Adequacy Ratio	CAR	Tier 1 capital + Tier 2 capital/Risk Weighted Assets
	Net Interest Margin	NIM	(Net return on investment– Interest paid)/Average Assets
	Return on Assets	ROA	Net Income/Total Assets
	Nonperforming Loan	NPL	Classified Investment/Total Investment

(Source: Self-Created)

5. STATISTICAL ANALYSIS

5.1 Research Hypothesis

Based on the connection between the theoretical framework and research objectives, the following alternative hypothesis outlines the research topic.

H0¹: The capital adequacy ratio has a favorable impact on the Loan to debt ratio.

H0²: Net interest margin has a favorable impact on the Loan to debt ratio.

H0³: Nonperforming loans impact the loan-to-debt ratio unfavorably.

H0⁴: The return on assets impacts the Loan to debt ratio favorably.

H0⁵: Loan debt ratio impacts include capital adequacy ratio, net interest margin, nonperforming loans, and return on assets.

T and F tests were employed to verify the results’ legitimacy by comparing the means and variances of different data sets. They have also been used to see if the independent factors significantly influence the dependent variables.

5.2 Approach to Model Construction and Estimation

The regression equation is mentioned as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where,

Y= Loan to Deposit Ratio

a= constant

X₁= Capital Adequacy Ratio

β₁= Coefficient of Capital Adequacy Ratio

X₂= Net Interest Margin

β₂= Coefficient of Net Interest Margin

X₃= Nonperforming Loans

β₃= Coefficient of Nonperforming Loans

X₄= Return on Assets

β₄= Coefficient of Return on Assets

e= Residual

6. RESULTS AND DISCUSSIONS

This paper used descriptive and verification methods to get a good outcome and analyze the data. The descriptive method is used to analyze the data that will describe the collected data, based on which a conclusion will be provided. The verification method determines the relationship between two or more variables and tests the hypothesis, determining the relationship between dependent and independent variables (Sugiyono, 2009).

6.1 Descriptive Statistics Analysis

This study presents the descriptive statistics for the dependent variable, LDR, and the independent variables, CAR, NIM, NPL, and ROA, during seven years from 2013 to 2019. The SPSS version 20 approach was utilized in the production of the output. The LDR indicates that the specified bank has an average performance of 0.97, with a standard deviation of 0.1018 [see Appendix Table-01].

With a standard deviation of 0.14, the computed mean value of CAR is 0.084. NIM is found to have an average value of 0.34 and a standard deviation of 0.098. The NPL statistics show a mean value of 0.092 and a standard deviation 0.215. The sample ROA [Appendix: Table 1] has a mean value of 0.056 and a standard deviation of 0.134.

6.2 Analysis of the Variables

From 2013 to 2019, a seven-year statistical analysis was conducted on the dependent and independent variables. The confidence level is established at 95%. The median of the LDR is 0.934; the LDR has a standard error of 0.006, a kurtosis of 21.345, and a degree of skewness of -3.86. The CAR has standard error, median, kurtosis, and skewness characteristics of 0.007, 0.26, 39.76, and -7.26, respectively. A median of 0.31, a kurtosis of 4.61, a skewness of 0.89, and a standard error of 0.012 are observable for the NIM. The median is 0.029, the kurtosis is 21.93, and the skewness is 3.36. The calculated standard error for NPL is 0.0098. The median is 0.02, the kurtosis is 74.40, and the skewness is 7.53 for the ROA [Appendix: Table 2]. The standard error is 0.016.

6.3 Correlation Matrix

The Pearson Correlation Matrix illustrates the relationships between the variables. In this case, LDR and CAR have a positive (0.091) association. LDR and NIM have a positive correlation of 0.321. There is a negative, 0-.061, connection between LDR and NPL. A positive correlation coefficient (0.032) exists between LDR and ROA. It is not statistically significant that the LDR and other independent variables [Appendix: Table 3].

6.4 Coefficients and Regression Line

The following equation can be established Based on the regression analysis [Appendix: Table 4].

$$Y= 0.695+0.154X_1+0.196X_2-0.003X_3+0.051X_4$$

The above equation is explained as follows:

The equation shows that the constant factor is 0.695, which indicates that even if the LDR grows by 0.695, the CAR, NIM, NPL, and ROA are zero. Since the capital adequacy ratio in this case is 0.154%, an increase of 1% in the CAR will result in a 0.154% rise in LDR. Since the net interest margin ratio is 0.196, a 1% rise in the NIM ratio will result in a 0.196% increase in LDR. According to NPL 0.003, the LDR falls by 0.003% for every 1% increase in the ratio of NPL. Since the ROA ratio is 0.051, a 1% rise in the ROAR results in a 0.051% increase in LDR [Appendix: Table 4].

An examination of the correlation coefficient shows the direction and nature of the relationship between the independent and dependent variables. In this instance, LDR is the dependent variable, and the independent variables are CAR, NIM, ROA, and NPL.

The correlation and coefficient of determination between the independent and dependent variables are shown in Table 5. A strong relationship is indicated by the correlation (r) value of 0.612 between the independent (CAR, NIM, ROA, and NPL) and dependent (LDR) variables [Appendix: Table 5].

A coefficient of determination analysis was also performed to determine how independent factors impacted the dependent variable. With an R^2 value of 0.375, the independent factors have a 37.5% explanatory power over the dependent variables. Other factors not included here account for the remaining 62.5% [Appendix: Table 5].

The results of the ANOVA table [Appendix Table-06] demonstrate that the null hypothesis is rejected. The difference between the calculated F value of 3.77 and the table value and the significance value of 0.008, which is less than 0.05, confirms this. At the 0.05 significance level, the alternative hypothesis is thus accepted. According to the findings, the NPL, ROA, NIM, and CAR influence the LDR.

6.5 Partial Significance Test (t-test)

6.5.1 Impact of Capital Adequacy Ratio on the Loan-to-Deposit Ratio

The partial significance test result is 1.43, and the relationship between the LDR and the CAR is 0.09, as per Appendix: Table 7. It suggests that the CAR affects the LDR. It follows that hypothesis H1, according to which the CAR positively impacts the LDR, is accepted as true.

6.5.2 Impact of Net Interest Margin on the Loan-to-Deposit Ratio

The partial significance test yields a t-test value of 2.6 and a 0.321 connection between the LDR and NIM [Appendix: Table 8]. The NIM influences the LDR. Hypothesis H2 is accepted, which states that the NIM favors the LDR.

6.5.3 Impact of Nonperforming Loans on the Loan-to-Deposit Ratio

The partial significance test for NPL and the LDR and their correlation is shown to be (-0.06), and the t-test result is 0.04. [Table 9 in Appendix]. It suggests that the LDR is unaffected by NPL. According to hypothesis H3, it can be said that NPL has a negative effect on the LDR.

6.5.4 Impact of Return on Assets over Loan to Deposit Ratio

The partial significance test results show that the LDR and ROA have a 0.03 association, and the t-test value is 0.53 [Appendix: Table 10]. The return impacts the LDR on assets. Hypothesis H4 is accepted, which states that ROA favors the LDR.

6.6 Simultaneous significant test (F-test)

The F-test determines the independent variables relative to the dependent variable. The effects of independent factors on the dependent variable are shown in [Appendix: Table 3]. The results of the F-test computation [Appendix: Table 11] show that the F-count was 3.87, which is more than the F-table value of 2.66, with a significance value of 0.006, which is less than 0.05. The independent factors, such as CAR, NIM, NPL, and ROA, significantly impact the dependent variable, the LDR. Thus, the LDR is thought to be affected by ROA, NPL, NIM, and CAR (H5).

7. DIAGNOSTIC TEST

7.1. Multicollinearity: The Correlation coefficients above 0.8 or 0.9 suggest high multicollinearity. So, there is no sign of multicollinearity among the variables in this study [Appendix: Table 4].

7.2. Heteroscedasticity: The Breach-Pagan Test showcases no presence of heteroscedasticity at a 5% significance level [Appendix: Table 12].

7.3. Autocorrelation: Appendix Figure (1-4) presents ACF plots that indicate no serious autocorrelations.

8. LIMITATIONS

This study has some limitations. Due to technical reasons, it was impossible to show the multicollinearity test. On the other side, the value of R^2

is only 0.375 [see Appendix Table-3]. That means only 37.5 % of the dependent variable's variance can be explained by independent variables. The remaining 62.5 % will be explained by other variables not included in this study, which is a significant drawback of the study's results and opens the door for future research into incorporating other criteria to achieve a better outcome.

9. CONCLUSION & POLICY IMPLICATIONS

The performance of the bank is guaranteed by efficient allocation of funds. The increasing prevalence of nonperforming loans leads to a disruption in efficiency. Consequently, the bank's performance will be adversely affected. Furthermore, the banking industry significantly influences Bangladesh's capital market. Moreover, this research will prove advantageous to investors operating in the capital markets. As a dependent variable, the loan-to-deposit ratio measures the bank's institutional performance. ROA, NIM, NPL, and CAR are the four independent variables. The LDR, ROA, NIM, and CAR are all positively correlated.

Conversely, negative associations are shown for the NPL. Nevertheless, the independent factors can only account for 37.5% of the variation in the dependent variable, leaving the remaining 62.5% to be explained by other variables. Therefore, policy implications concerning the banking industry's efficiency should include a comprehensive understanding of the liquidity position, operational risk, and other elements influencing profitability. Therefore, this paper provides a detailed analysis of how liquidity and operational efficiency impact the banking industry's long-term success, which could further imply effective policymaking.

10. RECOMMENDATIONS

- One way to deal with this problem is to figure out what is causing NPL and work with them. Banks can use the following actions to solve the challenge:
- Banks must be more efficient in terms of fund management. First, they must verify that all loan disbursements are free of political or personal interference.
- It would be better if they focused on shorter-term and smaller-amount loans rather than long-term and large-amount loans.
- A better service amid a downturn can also encourage clients to repay their debts on schedule.

- When they are done with that, they will need to figure out which industries have the highest percentage of NPL and work with them.
- Finally, they are responsible for ensuring that the guidelines issued by the central banks are appropriately implemented.

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APPENDIX

Table 1: Descriptive Statistics of independent variables, Capital Adequacy Ratio, Net Interest Margin, Nonperforming Loan, and Return on Equity, and the dependent variable, Loan Deposit Ratio,

Variables	Minimum	Maximum	Mean	Std. Deviation
LDR	.0101	1.6457	.9749	.1018
CAR	-.8657	1.2568	.0845	.1425
NIM	-.1783	1.6085	.3471	.0986
NPL	.0015	.9089	.0928	.2158
ROA	-.2154	.9785	.0568	.1346

Source: SPSS Output

Table 2: Analysis of the variables

Variables	N	Range	Standard errors	Median	Sample variance	Kurtosis	Skewness	Confidence level (95.0%)
LDR	210	1.6356	.0092	.9348	.0259	21.3457	-3.8659	.0156
CAR	210	2.1225	.0032	.2658	.0201	39.7684	-7.2654	.0179
NIM	210	1.7868	.0052	.3125	.0169	4.6172	.8962	.0160
NPL	210	0.9074	.0068	.0297	.0187	21.9347	3.3652	.0240
ROA	210	1.1939	.0169	.0246	.0175	74.4053	7.5329	.0113

Source: SPSS Output

Table 3: Pearson Correlation Matrix

		LDR	CAR	NIM	NPL	ROA
Pearson correlation	LDR	1.000	.091	.321	-.061	.032
	CAR	.091	1.000	-.371	-.751	.197
	NIM	.321	-.371	1.000	.201	-.163
	NPL	-.061	-.751	.197	1.000	-.202
	ROA	.032	.201	-.163	-.202	1.000
Sig. (1-tailed)	LDR	.	.099	.003	.197	.286
	CAR	.099	.	.000	.000	.003
	NIM	.003	.000	.	.002	.013
	NPL	.197	.000	.002	.	.005
	ROA	.286	.003	.013	.005	.

Source: SPSS Output

Table 4: Coefficients

Model	Unstandardized coefficients		unstandardized coefficients	t	p> t	95% confidence interval for β		Correlation			collinearity statistics	
	β	std. error				lower bound	upper bound	zero order	partial	part	tolerance	VIF
CONSTANT	.695	.029		31.521	.000	.753	.827					
CAR	.154	.089	.149	1.437	.124	-.029	.298	.091	.121	.112	.611	1.835
NIM	.196	.078	.198	2.683	.001	.121	.395	.211	.253	.251	.897	1.179
NPL	-.003	.069	.004	.041	.867	-.135	.129	-.061	.001	.001	.601	1.764
ROA	.051	.087	.029	.531	.702	-.172	.263	.032	.029	.029	.896	1.131

DEPENDENT VARIABLE: LDR

Source: SPSS Output

Table 5: Coefficients of Determination and Correlation

MULTIPLE R	R SQUARE	ADJUSTED R SQUARE
.612	.375	.351

Source: SPSS Output

Table 6: ANOVA^b

Model	Sum of squares	df	Mean square	f	sig.
Regression	.196	4	.049	3.770	.008 ^a
Residual	2.712	201	.013		
Total	2.908	205			

a. Predictors: (constant), ROA, CAR, NPL, NIM

b. Dependable Variable: LDR

Source: SPSS Output

Table 7: T-Test of Loan Deposit Ratio and Capital Adequacy Ratio

. t-test ldr == car, unpaired						
two-sample t-test with equal variances						
Variable	Count	Mean	Std. Err.	Std. Dev.	[95% conf. Interval]	
LDR	210	.9749	.0092	.1018	.9362	.9689
CAR	210	.0845	.0032	.1425	.0652	.1215
combined	420	1.0594	.0124	.2443	.5386	.6179
diff		.8904	.006	.0407	.8715	.8474
diff = mean (LDR) – mean (CAR)						
t = 148.4000						
Ho: diff = 0						
degrees of freedom = 418						
Ha: diff < 0		Ha: diff! = 0		Ha: diff > 0		
Pr (T < t) = 1.0000		Pr (T > t) = 0.0000		Pr (T > t) = 0.0000		

Source: SPSS Output

Table 8: T-test (LDR and NIM)

. TTEST LDR == NIM, UNPAIRED						
TWO-SAMPLE T TEST WITH EQUAL VARIANCES						
Variable	Count	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)	
LDR	210	.9749	.0092	.1018	.9362	.9689
NIM	210	.3471	.0052	.0986	.3789	.4251
combined	420	1.322	.0144	.2004	.6345	.6015
diff		.6278	.004	.0032	.6128	.6582
diff = mean (LDR) – mean (NIM)						
t = 156.9503						
Ho : diff = 0						
degrees of freedom = 418						
Ha: diff < 0		Ha: diff! = 0		Ha: diff > 0		
Pr (T < t) = 1.0000		Pr (T > t) = 0.0000		Pr (T > t) = 0.0000		

Source: SPSS Output

Table 9: T-Test (LDR and NPL)

.tt test LDR = = NPL, unpaired						
Two-sample t-test with equal variances						
Variable	Count	Mean	Std. Err.	Std. Dev.	(95% conf. Interval)	
LDR	210	.9749	.0092	.1018	.9362	.9689
NPL	210	.3471	.0068	.2158	.06718	.2158
combined	420	1.3220	0.0160	.3176	.5328	.6179
diff		0.6278	0.0024	.1140	.76902	.7531
diff = mean (LDR) – mean (NPL)						
t = 261.5833						
Ho : diff = 0						
degrees of freedom = 418						
Ha: diff < 0		Ha: diff! = 0		Ha: diff > 0		
Pr (T < t) = 1.0000		Pr (T > t) = 0.0000		Pr (T > t) = 0.0000		

Source: SPSS Output

Table 10: T-Test (LDR and ROA)

.tt test ldr = = roa, unpaired						
Two-sample t-test with equal variances						
VARIABLE	COUNT	MEAN	STD. ERR.	STD. DEV.	(95% CONF. INTERVAL)	
LDR	210	.9749	.0092	.1018	0.9362	0.9689
ROA	210	.0568	.0169	.1346	.02836	.0462
combined	420	1.0317	.0261	.2364	.4031	.5846
diff		0.9181	.0077	.0328	.9127	.9227
diff = mean (LDR) – mean (ROA)						
t = 119.2338						
Ho : diff = 0						
degrees of freedom = 418						
Ha: diff < 0		Ha: diff! = 0		Ha: diff > 0		
Pr (T < t) = 1.0000		Pr (T > t) = 0.0000		Pr (T > t) = 0.0000		

Source: SPSS Output

Table 11: F-Test for Variances

	LDR	CAR	NIM	NPL	ROA
Mean	.9749	.0845	.3471	.0928	.0568
Variance	.0203	.0203	.0097	.0465	.0181
Count	210	210	210	210	210
Df	209	209	209	209	209
F		.9235	1.1628	.5628	2.4924
P(F<=f) one tail		.0729	.4379	.0001	3.6217
F Critical one-tail		0.8156	1.3642	0.8126	1.3654

Source: (SPSS Output)

Table 12: Heteroscedasticity Test

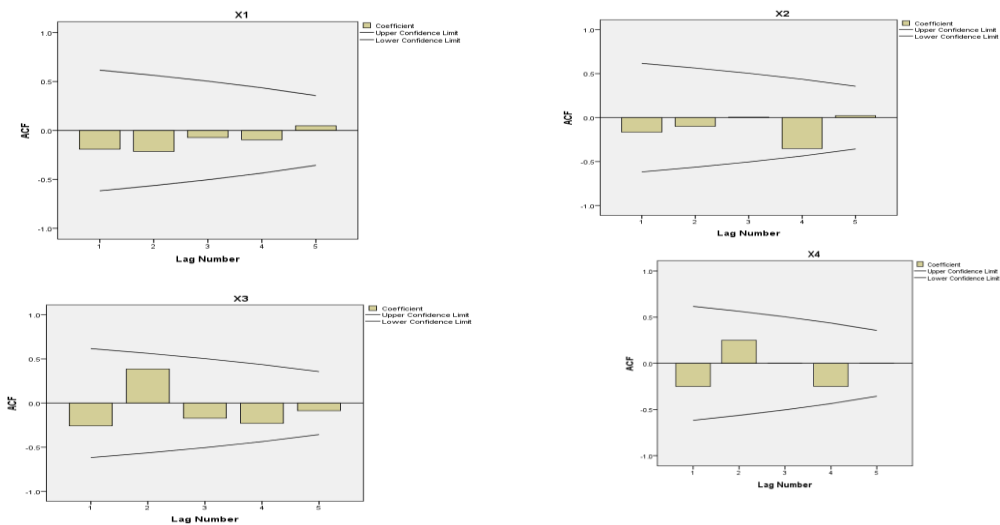
Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.329	.141		2.335	.023
	Predicted Values	.227	.062	.496	1.995	.052

a. Dependent Variable: Residuals^2

Source: (SPSS Output)

Autocorrelation Test

Figure :(1-4)



Source: SPSS output