Performance Evaluation of The Sierra Leone Banking Sector Using Camel Rating Framework

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Abstract

This study aims to evaluate the performance of the Sierra Leone banking sector using Camel rating framework. The study adopts a descriptive research design in which the Least Square regression method is used. The study covers the period from 2012 to 2021 inclusive. The variables considered for this study include capital adequacy, asset quality, earnings ability of the banks and liquidity management within the banking sector. From the findings of the study; all the variables used have positive relationships or coefficients except Asset Quality and Liquidity Management, which has a negative coefficient of-0.007021 and -0.03513 but these relationships are insignificant to banks' performance in Sierra Leone. The findings from the study also indicate that Capital Adequacy and Earning Ability are having positive and significant effect on bank`s performance in Sierra Leone.

Keywords: Profitability, Non-performing loans, Camels Framework.

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1. Introduction

In recent times, both developed and developing economies have depended heavily on the efficient distribution and optimal utilization of resources, especially financial resources Ngumi (2015). The financial sector as a whole play an important role in the economic development of a nation. Commercial Banks as financial intermediaries play a significant role in the financial intermediation. Specifically, the excess funds of depositor, the surplus units, are issued out in the form of loans to the economic agents who need funds, the deficit units. This process helps the savings deficit units increase their wealth capacity through investment. The process of securing such funds through means of collaterals helps in the effective management of risks of (future) capital flow in an economy Daboh, et al (2022). In the financial intermediation process, banks play a vital role in the economic life of a nation by mobilizing, pooling, and channeling domestic savings into productive resources, thus adding value to wealth creation, Dincera, et al (2011). In bridging the gap between the deficit and surplus units through the maturity transformation, banks can be exposed to (high) risk, which invariably may affect their financial performance. This risk can have severe macroeconomic consequences when it is systemic. Therefore, the stability of the financial system (or the banking industry) is of critical concern to economic stability. It is in this respect that central banks on the globe have financial stability mandate, in addition to other mandate(s). For example, in the Bank of Sierra Leone Act, 2019, financial stability objective is critical and the Bank has a Financial Stability Department and Banking Supervision Department. According to Duramany-Lakkoh (2021) the non-conventional financial system has also attracted attention, especially with the introduction of the rural finance community initiative before the Ebola outbreak. The inflow credit from multiple sources has an impact on the structure of the financial system as a whole.

1.1   Problem Statement

Commercial banks operate in an environment that is highly volatile and depend heavily on customer's deposits for their survival, as a result, the need for regulatory requirement is of great concern to the macroeconomic stability in the country. Johnson, (2022) posit that, the banking sector in Sierra Leone is still exposed to high liquidity, market and operational risks, which ultimately have significant impacts on banks performance in the domestic economy. The results of Duramany-Lakkoh, et al (2022) show that management make use of control activities to ensure that the policies and procedures are carried out by important to stress checks to establish a warning system in managing remote risks and take the necessary actions to remove or minimise risks that will affects the overall performance of banks.

Over the years, the banking sector in Sierra Leone has gone through tremendous restructuring/adjustments in ensuring systems are set at the international standard when it comes to the operation of domestically operated banks. Evidence in 2018

for example, shows that the banking sector was generally sound/stable, with only a few banks manifesting challenges in terms of their performances BSL (2018). Recently upheavals in domiciled commercial banks - the two state-owned banks, Rokel Commercial and Sierra Leone Commercial Banks around 2012 and 2014 - 2017, and more lately First International Bank that prompted ownership are currently examples of financial institutions that were not able to meet their statutory capital requirements.

Duramany-Lakkoh, et al (2022) noted that commercial banks are making strides in promoting economic growth in a country through the creation of facilities, which include loan issuance - notable examples include the creation of business opportunities that support employment and the opportunity for revenue generation through taxes raised by the National Revenue Authority (NRA). In the process of creating such opportunities, banks may be exposed to high risks, which have the potential of impacting their long-term stability in the banking industry and also resultant instability in the entire financial system. The motivation and aim therefore of this study are to investigate the effectiveness of the supervisory authority in monitoring the financial performance of commercial banks in Sierra Leone. In addition, it is also the intention of the study to identify banks that are prone to failure using the CAMEL rating model. This study is unique in terms of its value addition to knowledge as evidence shows that no studies had been pursued to explore this model approach for Sierra Leone. The study will utilize data spanning 2012-to 2021, which will be very useful in terms of impacting policy formulation by both the BSL and the fiscal authority in Sierra Leone. This study is being guided by two key specific objectives in order to help achieved its aim;

i.   To investigate the financial stability situation of commercial banks in Sierra Leone based on the CAMELS and determine how they are affected by commodity and health shock.

ii. To investigate the effect of other financial soundness indicators on a financial soundness indicator (ROA) based on the CAMELS.

The rest of this paper is structured as follows. In section 2 we reviewed literatures on the Camel rating system and related empirical review on previous research papers. Section 3 of this paper consists of the methodology and analysis of results using both descriptive and inferential statistics and finally, section 4 of this paper includes the conclusion and recommendations of the study for policy implications.

2. Literature Review

2.1   An Overview of Camel Rating System

The CAMEL rating system is an international and well-recognized model established/developed in the United States of America (USA) in the 1970s by the three federal regulatory banking authorities - it is now being implemented by regulators worldwide including Sierra Leone. Shakil & Roy (2021) refer to the camel rating model as the technique used by regulatory authorities (specifically central banks) to supervise the activities of commercial banks and other related financial institutions to ensure financial soundness indicators of the banking system are in line with regulatory requirements. Banks are normally supervised based on five key factors, namely "Capital adequacy, Assets Quality, Management Efficiency, Earning Ability, and Liquidity management" Sahajwala & Bergh (2000). However, most banks have added "Sensitivity to market risk" as part of the supervisory measures. To fully capture the financial soundness and activities of commercial banks and other related financial institutions, the banking regulator / central bank normally conducts both the on-site and off-site supervision regularly Babu & Kumar (2017). The off-site banking supervision involve the process of supervising all licensed banking institutions through various statutory financial report which include trend in credit risk, banks returns, interest rate risk, asset quality of the bank, liquidity and as well as the growth in asset and liability submitted for inspection on periodical basis.

Gilbert, et al (2002) noted that the result from the off-site supervision help examiners in identifying the risk and financial soundness of an individual bank, and the banking system as a whole. On the other hand, the on-site banking supervision involved regular visitation to licensed banking institutions by supervisory authorities in order to evaluate management performance and associated risk, assess the accuracy of the accounting records and the financial statements, evaluate the rate at which bank comply with laid down rules and regulations and as well evaluate the bank policies and procedures and their ability to control all the inherent risks identified by the supervisory authorities Dang (2011). Pettway & Sinkey (1980) further asserted that the on-site banking supervision serve as the backbone for supervisory authorities when conducting bank examination. CAMEL framework, a model that is commonly used by regulators to determine the health and soundness of the overall banking industry in a country Naushad (2021), help examiners to provide both the composite and components rating on banks according to their performance. Gaul & Jones (2021) also noted that examiners normally assign CAMEL Rating on banks after conducting their examination, in which the scale of rating range from 1 to 5. Thus, each aspect of the CAMEL model is rated as strong, stable, improvement needed or weak. Table 1 give a brief description of the CAMEL Composite Rating by Desta (2016) is shown in table 1;

Table 1: Description of the Camel composite ratings

Rating 1	Banks in this category are sound in every aspect of their operations and having a strong risk management mechanism in place to hedge againt inherent risk. Banks in this group are also having component rating of 1 or 2. Supervisory concerns does not required in this category
Rating 2	Banks in this category are fundamentally sound at a satisfactory level in terms of its operations and the management of all inherent risks. Banks in this category must not have component rating above 3. Experiencing moderate weaknesses, but are under the control of management
Rating 3	Banks in this category are having unsatisfactory and weak performances in one or more of the component rating, which required supervisory concern to some extent
Rating 4	Banks in this category are generally unsafe and unsound in its operations and performance is below average criteria set. Thus, this category required close supervisory control and immediate action
Rating 5	Banks in this category are extremly unsatisfactory and unsound in terms of every aspect of the component rating. Thus, supervisory concern is highly required here, as there is high tendencies that banks in this category are prone to failure.

Source: Researchers (2022)

2.2 Determinant of Banks`s Performance

The determinant of bank`s performance falls under two key categories that is; the internal and the external factors. The internal factors are the individual behaviour of the bank that arises on the course of it day to day operations and they are normally under the control of management. While the external determinant of bank`s performance are those factors that are beyond the control of management. However, the CAMEL model which stands for Capital Adequacy, Asset Quality, Management Efficiency, Liquidity Management are normally used to determine bank individual factors.

2.2.1 Capital Adequacy

Capital adequacy is the amount of capital a bank has to have as required by the regulatory body of a country. Banks with adequate capital will create liquidity for the bank and hence reduces the prospect of bank distress. Pajutagana, (1999) posits that when evaluating the capital adequacy of a bank, management must consider the effect of market risk, credit risk and other inherent risk on the financial performance of the bank. Lad & Ghorpade (2022) also noted that capital adequacy ratio plays a significant role on the economic performance of bank balance sheet, banks with high capital adequacy ratio has the ability to meet its obligations and having less chances to be bankrupt in case of crisis.

2.2.2 Asset Quality

The term Asset Quality refers to the quality of loans that the bank has given out and serves as the specific factor that affects the profitability of banks. The asset quality of the bank has a direct relationship with the profitability of commercial banks. As in line with the CAMEL rating system, the Portfolio at risk and the write-off policies are used as the quantitative indicator in determining the non-performing loans or the asset quality of the bank Khatri (2019).

2.2.3 Earning Ability

According to Albertazzi & Gambacorta (2006), they believed that a reduction in the interest margins will force banks to explore alternative sources of revenue resulting in diversifying their trading activities, non-trading financial operations and other services. The sustainability of commercial banks depends greatly on how banks can generate sufficient revenue over their running operating costs.

2.2.4 Management Efficiency

Management efficiency is one of the most important elements of the CAMEL model and the key internal factors that determine the profitability of a bank. It is determined by various financial ratios like growth in assets, and aggregate growth in loans. Thus, it serves as one among the complexes subject to capture with financial ratios. Management efficiency also refers to the capability of management and the board of directors in identifying all the inherent risk that the bank is exposed to, the ability to monitor and measure credit risk, and as well ensure that the bank operate in a sound and safe manner and at the same time abide to all rules and regulations set by the regulatory body.

2.2.5 Liquidity Management

Liquidity refers to the power of the bank to meet its obligations, mainly from depositors. A sufficient liquidity level is positively connected with banks' profitability. Liquidity also refers to the ability of the bank to convert it liquid assets into cash quickly when the need arises or the ability of the bank to pay off its debt obligation immediately when due Gul Zeb (2011).

2.3 Empirical Literature Review

Various studies have been conducted globally in evaluating the performance of banks using different models and metrics including the CAMELS with varying conclusions.

Afroj (2022) examine the financial strength of the banking sector in Bangladesh using the CAMEL framework for the period 2010-2015 on 35 commercial banks. The study adopted the additive function model using the CAMEL rating system combined with panel data regression to determine the financial strength of commercial banks in Bangladesh. The findings from the study revealed that; the Islamic commercial banks are financially strong in Bangladesh and also outperform

the conventional and Islamic window banks, with a relatively higher liquidity.

Ahsan (2014) also measure the financial performance based on CAMEL with three selected Islamic banks in Bangladesh from 2007 to 2014 using a descriptive research method. Results from the study revealed that all three selected Islamic commercial banks were financially strong on their composite rating in all aspects of the CAMEL rating.

Muhmad & Hashim (2015) assess the performance of commercial banks in Malaysia using the CAMEL framework from 2008 to 2012 with the use of regression analysis. The study found out that capital adequacy, asset quality, earnings ability, and liquidity management have significant impacts on the financial performances of commercial banks in Malaysia.

Ngoboka & Gatauwa (2020) conducted study on the CAMEL rating system and the financial performance of commercial banks in Rwanda during the period 2014 to 2018. The study adopted the descriptive research design method, in which the regression model was used in determining the correlation that exists between the predictor and the outcome variables. Results from their study revealed that, capital adequacy and asset quality are positively correlated with the financial performance of commercial banks, while earning management, management efficiency, and liquidity management are manifested in negative correlation.

Selvaraj & Devi (2022) examined the credit risk management and performances of commercial banks in India using the CAMELS rating model over 9 years' period (2011-2019) for 10 privately owned commercial banks. Multiple regression models were used to determine the functional relationship that exists between the dependent variables representing the financial performance of banks and the independent variables. The result from their study revealed that earning ability of the banks significantly affects banks' performances. The study further concludes that capital adequacy, asset quality, and liquidity management also significantly affect the financial performance of banks, while management efficiency and sensitivity to market risk negatively affect banks' performances in India.

Echekoba, et al (2014) conducted study on the determinant of bank profitability in Nigeria using the CAMEL rating model for the period 2001 to 2010. The ordinary least square method was applied in the study using statistical package for social science (SPSS). The findings from their study revealed that liquidity management has significant impact on the financial performance of commercial banks in Nigeria, while capital adequacy, assets quality, management efficiency, and earning ability manifest negative impacts.

T/Mariam & Mergu (2019) investigate the relationship between financial performance and CAMEL rating of commercial banks in Ethiopia using data for the period 2012-2017. The descriptive research design method was used in the study, in which both the ratio analysis and econometric models were used by constructing a regression model. Both the ROA and the ROE were used as the dependent variables, while the CAMEL model represents the independent variables. The study revealed that capital adequacy, asset quality, and management efficiency have significant effect on banks' performance while earning ability and liquidity

management manifest no effect on the financial performance of commercial banks in Ethiopia.

Gabriel (2012) examines the financial performance of both foreign and local banks in Ghana using the CAMEL Rating framework for the period 2006 to 2010. The study makes use of the multiple regression model to determine the relationship that exists between the dependent variables (ROA and ROE) and that of the independent variables (CAMELS). The results from the study revealed that foreign banks in Ghana outperform the local banks in terms of capital adequacy ratio, assets quality, and management efficiency, while the local banks in Ghana are highly liquid and at the same time having better earning ability than the foreign banks.

Given the aforementioned empirical research outcomes, it is the intention of this study to pursue the CAMEL model that is backed by regression technique to explore their effect on banks' performance in Sierra Leone.

3. Methodology and Analysis of Result

The study adopted a descriptive research design method, in which the target population of the study consists of the 14 commercial banks licensed and registered with the Bank of Sierra Leone. Secondary data were collected from the financial stability report from the Bank of Sierra Leone, and World Bank report on Sierra Leone economic update. The Least Square Regression method was used to determine the functional relationship that exists between the dependent variables representing the performance of banks Returns on Assets (ROA) and the independent variables representing the CAMEL model, with the exclusion of the management efficiency from the model due to limited access to data. The scope of the study ranged from 2012 to 2021 given limited access to data in capturing and the basic model specification for a simple linear regression estimation is stated thus:

$$Y = \beta_O + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_t \tag{1}$$

Where; β_O is the constant or the intercept of the variables,
$\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4$ are the co-efficient of the variables.

$$Y = \beta_O + \beta_1(\text{CAR}) + \beta_2(\text{ASQ}) + \beta_3(\text{LQM}) + \beta_4(\text{ERA}) + \mu_t \tag{2}$$

Where; ROA (Returns on Asset), CAR (Capital Adequacy Ratio more recent times), ASQ (Asset Quality), ERA (Earning Ability), and LQM (Liquidity Management).

4. Analysis of Data

4.1 Stylized Facts of the CAMEL Profile of the Banking Industry in Sierra Leone

4.1.1 Capital Adequacy Ratio

The graph below presents the trend analysis in the capital adequacy ratios within the Sierra Leone economy. The result from the graph below revealed that; there has been a year-on-year increase in the regulatory capital ratio with a significant increase in 2019 and 2021 with a CAR of 41.7% and 41.3% and also experiences a drastic fall between 2012, 2013, 2014 and 2016 to 27.7%, 30.1%, 30.2% and 30.7%. In figure 1 below it can be observed that the fall in 2014 and 2016 may be attributed to the Ebola Outbreak and the fall in international commodities prices such as iron ore, and oil prices etc. During 2019 to 2020 the CAR drastically falls to 40.1%, this was due to the Corona Virus pandemic. However, the economy rebounded again in 2021 with an increasing g rate of CAR to 41.3%.
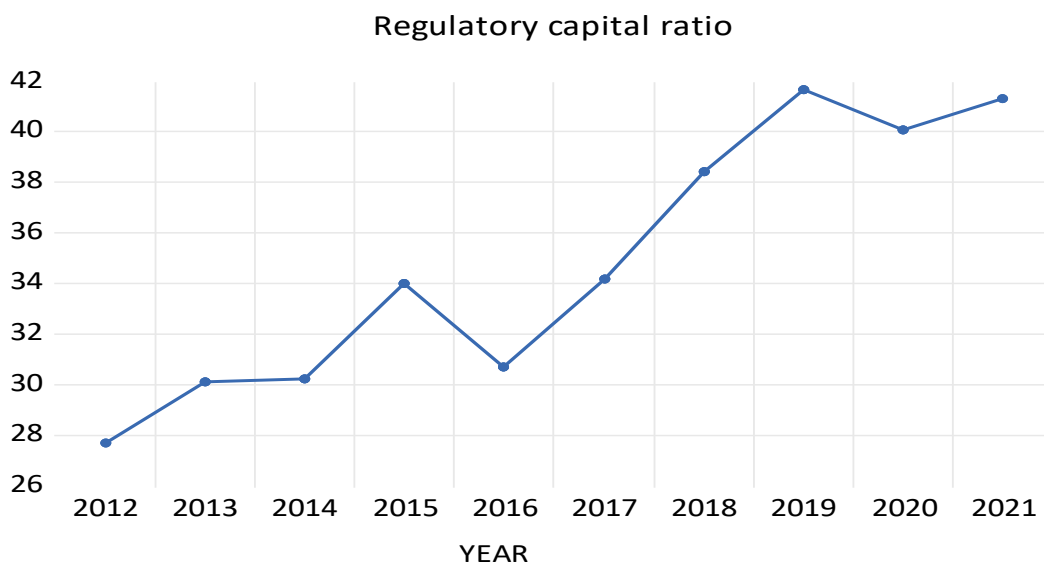

Figure 1: Regulatory Capital Adequacy Ratio

4.1.2 Asset Quality

The charts below present the trend analysis in asset quality of the banking sector. Figure 2 below presents the Asset Quality of the banking sector in Sierra Leone, which consists of both the NPL to total gross loans and NPL (Net of provisions) to regulatory capital. There has been a significant increase in the NPL to total gross loans on a yearly basis with it recording the highest figures in 2014 and 2015 with 33.4% and 31.7% and also with a slight decrease in 2012, 2017 and 2018 to14.7%, 14.6%, and 12.7% respectively. In 2020, we can observe that the NPL to total gross drastically decline to 12.7% from 16.8% in 2019 despite the Corona Virus pandemic situation in the economy. On the other hand, looking at the trend analysis of the

NPL (Net of provisions) to regulatory capital, it shows a similar trend to that of the NPL to total gross loans with it also recording the highest figures in 2014 and 2015 with 41.8% and 31.9% and drastically slowing down to 9.9% in 2018. Also, in 2020 the NPL (Net of provisions) to regulatory capital drastically fall to 4.3% from 7.2% in 2019 and also increase to 4.7% in 2021. Thus, the increase in the NPL in 2014 and 2015 may be attributed to the Ebola outbreak and the fall in iron ore prices. Evidence from the Bank of Sierra Leone Financial stability report also indicate that the increase in non-performing was attributed to the delay of government in paying contractors within the domestic economy.
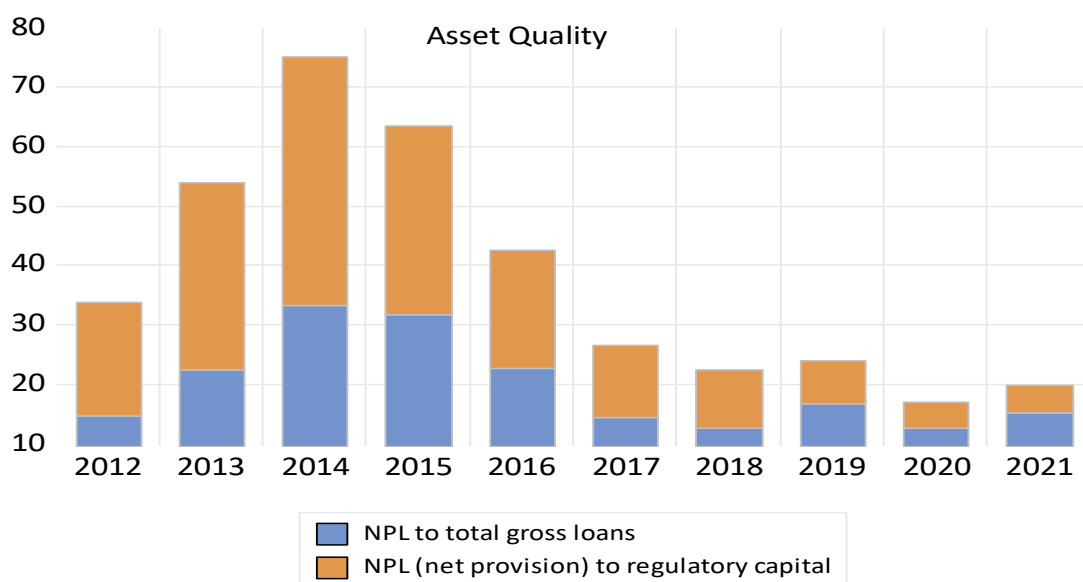
Figure 2: Asset Quality showing Non performing loans to total gross loans and non-performing loans (net provision to regulatory capital)

4.1.3   Earning Ability

The graphs below present the earning ability of the banking sector in terms of Returns on Equity and Returns on Assets. The result from the graphs below revealed that the banking sector in Sierra Leone has experienced an increase in both the ROE and ROA every year and this shows how sound the banking sector is. The highest increase of ROE was recorded between 2018, 2019, 2020 and 2021 with 27.25%, 26.1%, 25.7%, and 23.9% and also recorded a slight decrease between 2016 and 2017 with 22.3% and 25.6%, it drastically reduces in 2013 to 9.9%. However, the ROA has been fluctuating at an increasing rate. The highest figures of ROA were recorded between 2016 to 2020 with a stagnant figure of 6.1% on each year.
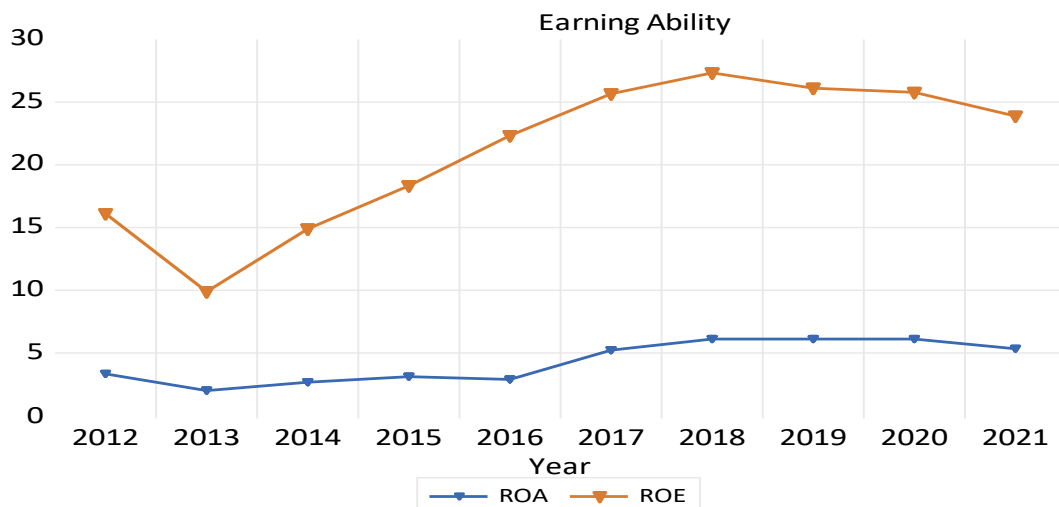
Figure 3: Earning Ability

4.1.4   Liquidity Ratio

The graphs below present the liquidity ratios of the banking sector in terms of both the Liquidity Ratio and Ratio of Net Loans to Total Deposits.

The Graphs below present both the Liquidity Ratio and Ratio of Net Loans to Total Deposits within the Sierra Leone banking sector. Evidence from the graph above shows that liquidity ratio has been increasing year on year basis showing the ability of the banking sector to meet its obligation as and when they arise. It recorded the highest liquidity in 2015 and 2016 with 83.3% and 85.5%, it drastically falls in 2012 to 40.7% but it was above the requirement set by the regulatory body. While the Ratio of net loans to total deposits has been fluctuating at an increasing rate.
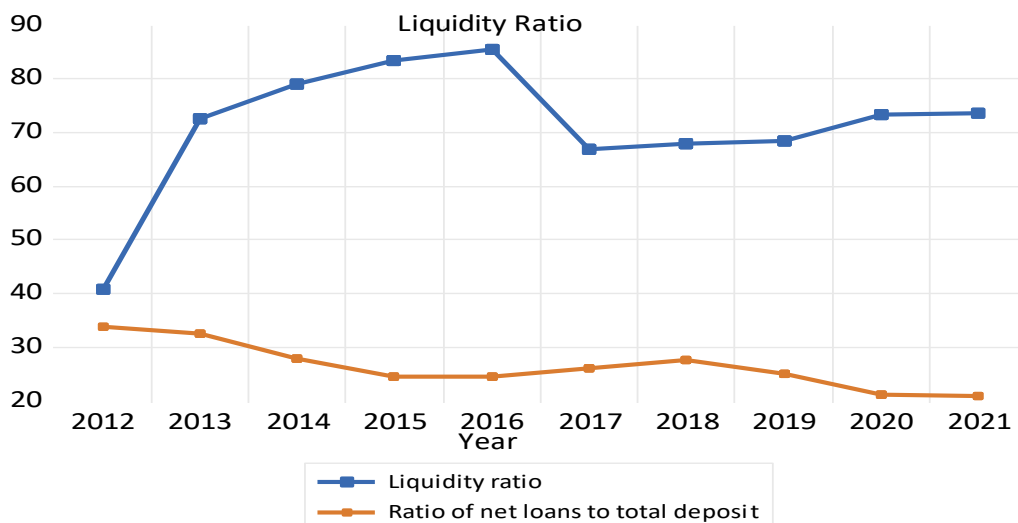
Figure 4: Liquidity Ration and Ratio of Net Loans to Total Deposit

4.2 Econometric Analysis

Table 2: Multiple Linear Regression Model

Dependent Variable: ROA				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CAR	0.167228	0.038843	4.305198	0.0077
ASQ	-0.007021	0.031165	-0.22529	0.8307
ERA	0.131496	0.037388	3.517048	0.017
LQM	-0.03513	0.01561	-2.250483	0.0742
C	-1.621603	1.14603	-1.414974	0.2162
R-squared	0.971804	Mean dependent var		4.33
Adjusted R-squared	0.949248	S.D. dependent var		1.609037
S.E. of regression	0.362488	Akaike info criterion		1.115201
Sum squared resid	0.656987	Schwarz criterion		1.266494
Log likelihood	-0.576005	Hannan-Quinn critter		0.949233
F-statistic	43.08307	Durbin-Watson stat		2.437485
Prob(F-statistic)	0.000458			

From Table 2 above**,** the estimated coefficients and the intercept are interpreted as follows:

i. The coefficient of β_1 i.e. CAR =0.167228 suggests that for every increase in Capital Adequacy Ratio , the ROA is expected to increase by rate of 0.167228

ii. The coefficient of β_2 i.e. ASQ= -0.007021 suggests that for every increase in Asset Quality, the ROA is expected to decreased by the rate of 0.007021

iii. The coefficient of β_3 i.e. LQM =-0.03513 suggests that for every increase in LQM, the ROA is expected to decreased by the rate of 0.03513

iv. The coefficient of β_4 i.e. ERA=0.131496 that for every increased in ERA, the ROA is expected to increase by the rate of0.131496.

v. The intercept β_0 $=$ -1.621603 is the expected mean value of response variable i.e. ROA when X_i's are all zero. This show that if the contribution of X_1, X_2, X_3 and X_4 are zero, ROA will be at -1.621603, this shows the great effect of predictor variable on ROA

From the above table, we can conclude that our multiple linear regression model for estimating and forecasting will be:

$$Y = -1.621603 + 0.167228(\text{CAR}) - 0.007021(\text{ASQ}) - 0.03513(\text{LQM}) + 0.131496(\text{ERA}) + \mu_t \tag{3}$$

4.2.1 Test of Significance

Hypothesis:

$H_o : \beta_i = 0$ Regression coefficients are statistically insignificant.

$Hi : \beta_i \neq 0$ Regression coefficients are statistically significant.

For the regression coefficients *CAR and ERA,* their sig value is less than 0.05 we therefore reject H_o, and conclude that their parameters are statistically significant while the parameter ASQ and LQM, their sig values are less greater than 0.05 we therefore do not reject H_o, and conclude that their parameter are statistically insignificant.

From the point above, we can derive the following from the results:

1. Capital Adequacy Ratio has positive significant effect on Returns on Assets
2. Asset Quality has negative insignificant effect on Returns on Assets
3. Liquidity Management has negative insignificant effect on Returns on Assets
4. Earning Ability has positive significant effect on Returns on Assets

From the table above $R^2 = 0.971804$ which indicate that 97.18% changes or variation in ROA for the year's study was explained by CAR, ASQ, LQM and ERA, while the remaining 2.92% were capture and unexplained by Random error which may results from other factor not considered in this research.

4.2.2 Test for Multicollinearity

Hypothesis:

H_o: $\rho = 0$ (there exist multicollinearity i.e variables are collinear

H_1: $\rho \neq 0$ (there isn't multicollinearity i.e variables are not collinear)

From the above and test of significance of T-Ratio, we can say that $R^2 = 0.971804$ which is high. From the test of significance, we could see that not all of the coefficients are significant. In this wise, we may not reject H_o that the independent variables are inter-correlated and there is Multicollinearity. In order to further check for the presence of multicollinearity, the Variance Inflating Factor test was conducted, with the assumption that If the VIF greater than 10 then there is severe multicollinearity.

Table 3: Variance Inflation Factors Test

Variance Inflation Factors			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
CAR	0.001509	142.1639	2.783012
ASQ	0.000971	32.54278	3.885440
ERA	0.001398	50.23787	3.299468
LQM	0.000244	96.37970	2.578442
C	1.313385	99.95520	NA

The result from the above table indicates that there is no presence of multicollinearity since all of the VIF values are less than 10 as seen in the table above.

4.2.3   Test for Autocorrelation

Hypothesis Testing:
H_0: $\rho = 0$ i.e. no autocorrelation
H_1: $\rho \neq 0$ i.e. autocorrelation exist

Table 4: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	3.314402	Prob. F(2,3)	0.1739
Obs*R-squared	6.884348	Prob. Chi-Square(2)	0.032

The critical Chi square-value for Observed R- square value is less than 0.05, we do not reject Ho and conclude that there is serial correlation in the data.

4.2.4   Heteroscedasticity Section

Detection of Heteroscedasticity using Goldfield Quant Test

Hypothesis:
H_0: $E(\mu_i^2) = \sigma^2$ the variance of error-term is constant for all observation (Homoscedacity)
H_1: $E(\mu_i^2) \neq \sigma^2$ the variance of error-term is not constant for all observation (Heteroscedacity)
$\alpha = 0.05$

Table 5: Test of Heteroscedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.866936	Prob. F(4,5)	0.5422
Obs*R-squared	4.095239	Prob. Chi-Square(4)	0.3933
Scaled explained SS	0.233829	Prob. Chi-Square(4)	0.9937

The critical Chi square-value for Observed R- square value is greater than 0.05, we therefore accept Ho and conclude that there is no heteroscedasticity in the error variances i.e. the disturbance terms are homoscedastic in nature.

4.2.5   ROA Residual Value

Since there is no regular pattern in the scatter plot of graph of standardized $\overline{y}_i$ and the studentized residual then there is no heteroscedasticity in the error variances i.e. the disturbance terms are homoscedastic.
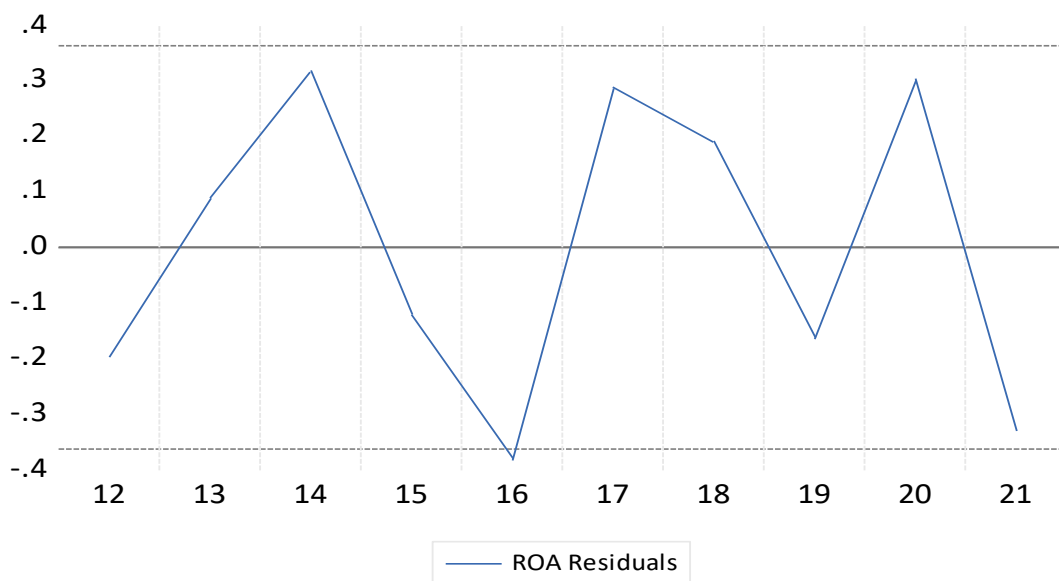
Figure 5: Residual Value

5. Conclusion and Recommendations of the Study

The study concludes that all the variables used have positive relationships or coefficients except Asset Quality and liquidity management, which has a negative coefficient of -0.007021 and $= -0.03513$ but these relationships are insignificant to banks' performance in Sierra Leone. The banking sector has experienced an increase in growth in terms of profitability, and an expansion of bank branches with a slight increase in the area of non-performing loans, especially in 2014 and 2015. The study, therefore, recommends the following:

i. That the Central Bank must be considerate when setting/implementing policies in regards to liquidity ratio and as well as the reserve requirements to enable banks to maintain liquidity position.
ii. Bank Managers must endeavor to maintain highly liquid assets with them.
iii. Financial inclusion must also be made an integral part of the banking sector's goal to expand service provision to everyone in the country.
iv. Management in banks must endeavor to strengthen credit evaluation procedures.
v. Central Bank must make it mandatory for commercial banks to send all credit applications to the credit reference bureau for profile checking, to avoid additional debt burden on the banking system.

Going forward, it is the wish of the authors for extensive research to be conducted that takes cognizance of the CAMELS rating framework, with the incorporation of both the *Management Efficiency* and *Sensitivity to market risk* variables, which is one of the main limitations in this study.

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