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Evaluating the Impact of Camel Variables on the Share Price of Banks in Nigeria

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Abstract

The research investigated the impact of CAMEL variables on the share prices of listed Nigerian commercial banks. The study used the Ordinary Least Squares (OLS), Random-Effects Model (REM), and Fixed-Effect Model (FEM) to examine the effects of capital adequacy, earnings, asset quality, managerial efficiency, and liquidity on the share prices of twelve commercial banks listed in Nigeria from 2011 to 2020. The Hausman test showed that the fixed effect model is preferable to the random effect model. The study found no correlation between capital adequacy, earnings, asset quality, and the commercial banks' share prices. In addition, managerial ability and liquidity had a significantly negative effect on the share prices of the studied commercial banks. The paper recommended that the Central Bank of Nigeria (CBN) undertake its on-site assessment function more regularly to better monitor and identify irresponsible and immoral behaviour that erodes capital, liquidity, and asset quality early so remedial actions may be adopted as soon as feasible.

Keywords: Fixed-Effect, Random-Effect, Share Price, CAMEL, CBN

Introduction

The banking system's functions extend beyond entities that process payments and offer loans. It includes all functions that direct actual resources to their end consumers. Banking is the foundation of financial intermediation since it mobilises and distributes financial resources. As a result, it is well recognised that the banking industry is the growth engine of every economy (Adeyemi, 2006; Onodi et al., 2021). The ability of banks to promote economic growth and development is contingent on the system's health, soundness, and capacity. As a significant sector, it must be reformed to increase its competitiveness and ability to play a crucial role in financing projects. Financial sector growth in a growing country, such as Nigeria, has been followed by structural and institutional changes. The sector is widely acknowledged to play a significant part in the nation's economic development (Ogujiuba & Obiechina, 2011). A bank's performance is evaluated on three levels: management, regulatory, and external rating agencies. The regulatory and supervisory rating systems aim to evaluate a bank's internal performance and compliance with regulatory standards to keep it on track. These

ratings are very private and inaccessible to the general public. However, external rating organisations investigate and assess banks and then give ratings to advise the general public and investors. Regulatory and external ratings must provide identical results to give investors and management precise information about an institution's performance and condition.

Nonetheless, some banks have failed in the past despite receiving favourable ratings from rating agencies and regulatory entities (Balasundaram, 2008). This indicates that both the internal rating system and external rating agencies have failed to manage the complexity of the banking industry and handle the risk to which banks are exposed (Maude & Dogarawa, 2016). Banks' condition and financial performance are evaluated using a mix of financial ratio analysis. In addition to financial ratios, research demonstrates that benchmarking, comparing performance versus budget, or combining these approaches are often used (Balasundaram, 2008).

The CAMEL rating system is one of the supervisory information measures developed and used to evaluate banks' overall condition and soundness (Maude & Dogarawa, 2016). The CAMEL rating system was established in the United States in 1979 as a supervisory rating system for evaluating banks' overall financial soundness. It is also known as the "Uniform Financial Institutions Rating System (UFIRS)." In 1997, the Federal Deposit Insurance Corporation (FDIC) amended the UFIRS to incorporate a sixth indicator (sensitivity) to categorise a bank's overall health (soundness) (Lopez, 1999; Boateng, 2019). The CAMEL rating system is now being used by banking regulators worldwide. CAMELS stands for Capital Adequacy, Asset Quality, Management Ability, Earnings, Liquidity, and Market Risk Sensitivity (Babu & Kumar, 2017; Yusuf & Tijani, 2019). It is an on-site assessment method for banking institutions that assures a bank's health is x-rayed and examined using hybrid performance measures based on several information sources such as financial statements, financing sources, macroeconomic data, budget, and cash flow (Lopez, 1999; Altan et al., 2014; Chaudhuri, 2018; Yusuf & Tijani, 2019). Even though the CAMELS model has been used for a long time in rating banks in developed financial markets, its application in developing financial markets such as Nigeria is still in its infancy, with studies to examine the health of Nigerian banks focusing on indicators such as Return on Assets (Abiola & Olausi, 2014; Wapmuk, 2016; Maude et al., 2020; Maude, 2021; Gwamna et al., 2022), and Return on Equity (Soyemi et al., 2014; Aliyu & Hassan, 2020; Olunuga & Akinrodoye, 2022).

Most studies on the effect of the CAMEL ratio on bank performance are based on foreign nations. Despite the growing importance of using CAMEL to evaluate bank performance in developing nations like Nigeria, research in the area has attracted little effort in the country (Adesina, 2012; Echekeba et al., 2014; Iheanyi & Sotonye, 2017; Lucky & Akani, 2017; Maude et al., 2020; Akinbo-Balogun, 2022).

The Ordinary Least Square (OLS) approach was used by Echekeba et al. (2014) to investigate the impact that the CAMEL model had on the profitability of commercial banks that traded on the Nigerian Exchange Group (NGX) from 2001 to 2010. Return on assets was used to evaluate the bank's performance. According to the findings, liquidity has a significant positive impact on bank profitability. On the other hand, capital adequacy, earnings quality, management quality, and asset quality have no effect on bank performance.

Iheanyi and Sotonye (2017) utilised OLS to investigate the impact of the CAMEL ratio on the performance of 19 NGX-listed commercial banks from 1996 to 2014. Profit before tax was used to evaluate the bank's performance. According to the findings, capital adequacy, earnings quality, management quality, and liquidity have insignificant effects on bank performance. However, asset quality has a significant negative impact on bank performance.

The impact of the CAMELS ratio on the profitability of seven systemically significant institutions (SIBs) between 2010 and 2018 was investigated by Maude et al. (2020) using the pooled OLS. The return on assets was used to assess the bank's performance. The results revealed a positive relationship between capital adequacy and bank performance, while asset quality, management efficiency, and liquidity did not affect bank performance. Additionally, the performance of banks is significantly impacted negatively by earnings quality.

This study was carried out due to the scarcity of literature on the subject in Nigeria and the inconsistency of previous research findings. The main objective of this study is to examine the effect of the CAMEL rating on the share prices of eleven listed Nigerian banks from 2011 to 2020, while the specific objectives of the study are to: -

- Investigate the effect of capital adequacy on the share prices of listed Nigerian banks.
- Examine the impact of asset quality on the share prices of listed Nigerian banks.
- Evaluate the effect of management ability on the share prices of listed Nigerian banks.
- Examine the impact of earnings quality on the share prices of listed Nigerian banks.
- Investigate the effect of liquidity on the share prices of listed Nigerian banks.

Literature Review

Concept of CAMEL Model

Capital Adequacy (C)

Sufficient and appropriate capital is required to maintain a functioning banking system. Every bank and credit institution must create a suitable capital-to-assets-risk ratio (Javaheri, 2014). Since time immemorial, banks have been exposed to various hazards due to extending credit and providing services. In 1988, the Committees on Banking Supervision of the BIS, based in Basel, Switzerland, set criteria for establishing the minimum capital required for bank operations. Since then, the financial markets have seen significant upheaval. For instance, the development of credit risk concepts and models has permitted the creation of new financial instruments for planning and pricing strategies, resulting in the precise growth of financial markets (Ebrahimi et al., 2017).

The capital adequacy ratio assesses banks' and financial organisations' performance, health, and financial stability. Banks should have adequate assets to cover the risk arising from their operations and take care to prevent depositors from incurring losses. Therefore, they should have the least amount of capital required to address operational risks (Bahrami, 2013; Ebrahimi et al., 2017).

Assets Quality (A)

The asset quality aids banks in determining the degree of risk they will disclose to their clients. This characteristic allows the bank to evaluate its assets' performance. Banks do their utmost to maintain a minimal proportion of non-performing loans since significant non-performing loan amounts damage their profitability (Sathyamoorthi et al., 2017).

The choice made by banks on the assignment of deposited cash determines the amount of credit risk and default risk. As a result, this component of bank evaluation objectives may be met by analysing banks' asset quality, including loans and securities. Non-performing loans, late maturities in the financial statement, reserve capital to cover future losses, and bank profitability are all needed data collected from the bank balance sheet (Tabatabaei, 2011).

Management Ability (M)

Given the importance of management to the performance of institutions and organisations, the knowledge, proficiency, competence, and accuracy of financial institutions' management are of special significance and are given significant weight in most indicator evaluations (Javaheri, 2014). The CAMEL model, which gauges a bank's strength, places a significant emphasis on management effectiveness. It relates to the bank's compliance with established standards, capacity to adapt to a changing environment, and management skills and leadership. It indicates the amount of bank management effectiveness. The effective operation of banks is in the hands of the Board of Directors, which includes the bank's important personnel (Sathyamoorthi et al., 2017).

Earnings Quality (E)

The quality of earnings and earnings process at a financial institution is significantly correlated with the quality of the firm's debts and asset management. A financial institution's earnings should be complemented by profitability to promote the expansion of assets and enhance the institution's capacity to reserve funds, increasing the owners' equity value. Good profit performance inspires depositors, investors, lenders, and the public sector to have greater confidence in banks (Bahrami, 2013).

Liquidity (L)

Liquidity is a bank's capacity to get funds to satisfy immediate or important demands. To gain public trust, banks must have sufficient liquidity to satisfy the needs of their depositors and facility users. Hence, financial institutions require an efficient debt and asset management system to reduce the maturity inconsistency of their obligations and assets and maximise their returns (Bahrami, 2013). Liquidity management is one of bank management's most crucial duties and obligations. Using short-term cash for long-term investments exposes the bank to the danger that investment account holders may demand their funds back, forcing it to liquidate its assets (Ebrahimi et al., 2017).

Empirical Review

Sathyamoorthi et al (2017) used OLS to analyse the correlation between the CAMEL ratio and the performance of three deposit money banks listed on the Botswana Stock Exchange between 2011 and 2015. Earnings per Share (EPS) was used to measure the bank's performance. The findings demonstrated that capital adequacy, managerial efficiency, earnings, and asset quality have no impact on the bank's performance. In terms of liquidity, the findings demonstrated that the cash ratio had a significantly negative impact on bank performance. However, the total deposits to total assets ratio had a significantly positive impact on bank performance.

Ping and Kusairi (2020) used the fixed-effects model to investigate the correlation between the CAMEL model and the financial performance of twenty-one (21) banks between the years 2013 and 2018. Bank performance was measured by ROA. The findings revealed that asset quality, managerial efficiency, and liquidity had significantly negative impacts on the performance of the examined banks. On the other hand, capital adequacy and earnings quality had significantly positive effects on the performance of the examined banks.

Thisaranga and Ariyasena (2021) examined the association between the CAMEL ratio and the performance of eight commercial banks listed on the Colombo Stock Exchange (CSE) from 2014 to 2019 using a fixed effect. The bank's performance was measured by return on equity.

The findings showed that capital adequacy, asset quality, and liquidity have no significant effect on bank performance. In addition, the research revealed a significant negative correlation between management efficiency and bank performance, whereas there was a significant positive correlation between earnings quality and bank performance.

In conclusion, the above literature review showed conflicting results on the effects of CAMEL ratios on ROA, ROE, EPS, and PBT. In the literature, the ratios used to calculate the CAMEL ratios are inconsistent, i.e., various researchers utilised different ratios. As proxies for capital adequacy, the researchers used debt to equity, total equity to total assets, risk-weighted capital to total assets, capital to asset ratio, and equity/risk-weighted assets, among others (see table 2.1). Therefore, banks are rated differently based on the effects of CAMEL ratios on ROA, ROE, EPS, and PBT.

Table 2.1
Proxy for CAMEL Attributes

CAMEL Attributes	Measurement	Source
Capital Adequacy	Debt/Equity Total Equity/Total Assets Capital to Asset Ratio Risk-weighted capital / total assets Equity/Risk-weighted assets	Ferrouhi (2014) Sathyamoorthi et al (2017) Nandar (2019) Maude et al (2020) Thisaranga & Ariyasena (2021)
Asset Quality	Loans provision/Total loans Total Loans and Advances/Total Assets Loan Loss Provision to Total Loan Ratio Non-performing loans to total assets Non-performing loans to total loans	Ferrouhi (2014) Sathyamoorthi et al (2017) Nandar (2019) Maude et al (2020) Thisaranga & Ariyasena (2021)
Management Ability	Net income/Total income Total Interest Expense / Total Deposits Non-Interest Expense/ Net Interest Income + Non-Interest Income Non-interest expenses/ noninterest income Operating Expenses/total income	Ferrouhi (2014) Sathyamoorthi et al (2017) Nandar (2019) Maude et al (2020) Thisaranga & Ariyasena (2021)
Earnings Ability	Net income/Total assets Net Income / Total Equity Net Interest Income to Total loan & Advance Net interest income/ total loans and advances Net interest/average earning assets	Ferrouhi (2014) Sathyamoorthi et al (2017) Nandar (2019) Maude et al (2020) Thisaranga & Ariyasena (2021)

Liquidity	Deposits/Total assets Cash and Cash Equivalent to Current Liability Loan to Deposit Ratio Total loans and advances to total deposits Total loans/ total deposits	Ferrouhi (2014) Sathyamoorthi et al (2017) Nandar (2019) Maude et al (2020) Thisaranga & Ariyasena (2021)
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Previous CAMEL studies in Nigeria, such as Echekeba et al (2014); Iheanyi and Sotonye (2017); Maude et al (2020), utilised sample years up to 2018. To the best of the researcher's knowledge, this is the only study that will use sample periods until 2020. This will improve our understanding of the connection between the CAMEL ratio and the performance of Nigerian banks. Regulators will find the results valuable for developing relevant laws and regulations, while prospective investors and other interested parties may make informed investment choices based on our findings.

Methodology

Sampling Technique and sources of data

The sample includes 12 commercial banks in Nigeria from 2011 to 2020, chosen from a population of 22 banks functioning in Nigeria on December 31, 2021. The 12 banks were chosen for the study since they offer a complete listing and data for the period under consideration. The purposive sampling method was used to pick the samples. The study makes use of secondary data. Data is gathered from company annual reports and accounts.

Model Specification

The research used the model developed by Boateng (2019), which examines the performance of Ghanaian banks using the CAMELS rating model.

The model is stated as $SP = \beta_0 + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 EQ_{it} + \beta_4 LQ_{it} + \beta_5 MA_{it} + \beta_6 FZ_{it} + e_{it}$

Where:

SP – Share Price

CA – Capital Adequacy

AQ – Asset Quality

EQ – Earning Quality

LQ – Liquidity

MA – Managerial Ability

FZ- firm size

β_0 - Constant

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5 = model parameters

e_t = error term

Measurement of Variables

Variables	Measurement
Share price	Sum of daily closing Share Price/Number of Days Share is traded
Capital Adequacy	The ratio of equity to total assets.
Asset Quality	Provision for Loan Losses
Earning Quality	The ratio of gross profit to total revenue
Liquidity	The proportion of loans to deposits
Managerial Ability	The ratio of operating expenses to gross revenue
Firm Size	Log of firm size

Results and Analysis

Descriptive Analysis

The descriptive data in Table 4.1 reveals that the mean Share Price (SP) value was 9.23, with a standard deviation of 10.70. The minimum and maximum values of SP were 0.5 and 47.95, respectively. The mean value of Capital Adequacy (CAR) is 9.24, the standard deviation is 22.08, the minimum value is -154.75, and the maximum value is 23.75. The mean value of Asset Quality (AQ) was -6.61, with a standard deviation of 44.98. The minimum and maximum values of AQ were -494.02 and 2.04, respectively. The mean value of Earning Quality (EQ) is 59.18, the standard deviation is 11.10, the minimum value is 28.19, and the maximum value is 83.67. Liquidity (LQ)'s minimum value is 3.55, and the maximum value is 138.00, with a mean value of 65.40 and a standard deviation of 19.87. The average value for Managerial Ability (MA) was 0.43, while its standard deviation was 0.1361. The minimum value of MF was 0.09, and the maximum value was 1.06.

Table 4.1
Descriptive Statistics

	Mean	Minimum	Maximum	Std. Dev.
SP	9.2351	0.5000	47.9500	10.7032
CA	9.6726	-154.7500	23.7500	22.0847
AQ	-6.6138	-494.0192	2.0424	44.9826
EQ	59.1814	28.19000	83.6700	11.09871
LQ	65.4031	3.5500	138.0000	19.8714
MA	0.4339	0.0865	1.0564	0.1361
FZ	6.8214	5.7100	7.4200	0.3784
Observations	120	120	120	120

Source: Author's Computation (2022)

Correlation Analysis

Table 4.2 shows that the correlation coefficients are less than 0.8, indicating that the study data is free of multicollinearity issues. According to Cooper and Schindler (2014); Al Zaidanin (2020), variables with correlation values of 0.8 or above suggest a multicollinearity concern that must be addressed in the regression model. The value for the coefficient of correlation between MA and LQ is "-0.22." There is a negative association between AQ and EQ, with a

coefficient of -0.0049". "0.6905" is the value of the correlation coefficient between AQ and CA.

Table 4.2
Correlation Analysis

	CA	AQ	EQ	LQ	MA	FZ
CA	1.0000	0.6905	0.1960	0.2659	-0.0287	0.4612
AQ	0.6905	1.0000	-0.0049	0.2887	0.1012	0.2800
EQ	0.1960	-0.0049	1.0000	0.0154	-0.2384	0.4365
LQ	0.2659	0.2887	0.0154	1.0000	-0.2166	0.0237
MA	-0.0287	0.1012	-0.2384	-0.2166	1.0000	-0.4102
FZ	0.4612	0.2800	0.4365	0.0237	-0.4102	1.0000

Source: Author's Computation (2022)

Regression Result

Table 4.3 consists of three rows: pool OLS, fixed, and random effects. The Hausman test was used to determine which of the fixed effect and random effect models was more suitable. The

Hausman test has a p-value of 0.0330, which is significant at the 5% level. This shows that we accept the alternative hypothesis and reject the null hypothesis. The fixed effect model is the suitable model for this investigation.

The determinant of the coefficient (adj R-squared) is 0.7778; this shows that variance in the independent variables (capital adequacy, asset quality, management efficiency, earnings quality, and liquidity ratio) accounts for 77 per cent of the variation in the dependent variable (Share price).

Table 4.3
Regression Result

Variables	Pool OLS	Fixed Effect	Random Effect
C	5.8284 (0.7757)	-62.7217 (0.1448)	-42.4610 (0.1377)
CA	0.0259 (0.6250)	-0.0386 (0.3818)	-0.0307 (0.4413)
AQ	0.0349 (0.1604)	0.0212 (0.1808)	0.0238 (0.1291)
EQ	0.4371 (0.0000) *	0.0975 (0.1930)	0.1408 (0.0442) *
LQ	-0.1097 (0.0120) *	-0.0951 (0.0013) *	-0.0974 (0.0009) *
MA	-28.9759 (0.0000) *	-15.5599 (0.0042) *	-17.5217 (0.0010) *
FZ	-0.4011 (0.8859)	11.6791 (0.0596) **	8.4720 (0.0388) *
Adj R-Squared	0.396185	0.7778	0.150344
F-Statistics	14.0134 (0.0000) *	25.50412 (0.0000) *	4.509434 (0.0004) *
Hausman Test Test Summary Cross-section random			13.7124 (0.0330) *

Source: Author's Computation (2022)

1. Capital Adequacy: The findings indicated that CA did not have any effect on the share price (beta = -0.0386, P-value = 0.3818 > 0.05). These findings provide credence to the conclusions reached by Thisaranga and Ariyasena (2021), who found no relationship

between capital adequacy and return on equity.

2. Assets Quality: The results showed that AQ did not have effect on the share price (beta = -0.0212, P-value = 0.1808 > 0.05). The results are the same as those of Nugroho et al. (2020), who looked at four state banks listed on the Indonesia Stock Exchange and found no link between asset quality and the price of their shares.
3. Earnings Quality: The findings showed that EQ had no effect on share price (beta = 0.0975, P-value = 0.1930 > 0.05). The results align with those reported by Ebrahimi et al. (2017). They discovered no correlation between the earnings quality and the financial performance of a sample of 14 banks listed on the Tehran Stock Exchange.
4. Liquidity: The results showed that LQ had a negative and statistically significant impact on the share price (beta = -0.0951; p-value 0.0013 < 0.05). A reduction in LQ will increase the price of the shares. This agrees with Ebrahimi et al. (2017), who found a significant inverse relationship between liquidity and financial performance.
5. Managerial Ability: The results show that MA had a significantly negative influence on the share price (beta = -15.5599, p-value = 0.0042 < 0.05). The increase in MA will result in a drop in the share price. The findings are consistent with those of Maude et al (2020), who identified a negative and statistically significant relationship between management ability and financial performance.

Conclusion and Recommendations

The banking sector, a fundamental component of economic growth, distributes cash from surpluses to deficits to produce a financially sound, growing, and sustainable state. This study investigated the impact of capital adequacy, asset quality, management ability, earnings, and liquidity on the share prices of twelve banks listed on the Nigerian Stock Exchange (NGX) from 2011 to 2020. The research results indicated no significant association between capital adequacy, earnings, asset quality, and the share price of the sampled commercial banks. On the other hand, management ability and liquidity have a significant negative influence on the share prices of the sampled commercial banks.

The paper makes several recommendations in light of the findings, one of which is that the CBN should perform its on-site examination function more frequently to improve its surveillance and ensure that reckless and unethical behaviour that erodes capital, liquidity, and asset quality is identified early so that corrective measures can be implemented as soon as possible.

Furthermore, management effectiveness must be emphasised for the organisation's benefit, not for personal gain. Many managers prioritise their personal interests above those of the industry. This leads to managerial inefficiencies.

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