Evaluating the Impact of CAMEL Variables on the Share Price of Banks in Sub-Sahara Africa

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Abstract

Purpose*:* This study aims to investigate CAMEL variables' effects on deposit money banks' share prices for twelve Nigerian banks, nine Kenyan banks, and five South African banks.

Methodology: The panel regression approach was utilised to analyse the study data. The share price was measured by the total of the daily closing share price divided by the number of trading days. Capital adequacy was proxied by the equity-to-total-asset ratio, management efficiency was measured by asset turnover, earnings quality was measured by gross profit margin, and liquidity was measured by the loan-to-deposit ratio.

Findings: The findings showed that asset quality positively and significantly influenced the share prices of the South African sample but had an insignificant influence on the share prices of the Nigerian sample*.* The managerial efficiency significantly and positively influenced the share prices of the South African sample but had an insignificant effect on the share prices of the Kenyan and Nigerian samples. Lastly, findings showed that liquidity negatively and significantly influenced the share prices of our Kenyan and Nigerian samples but had an insignificant influence on the share prices of our South African samples.

Originality/Value: The study's findings will help the management of African banks make good management decisions and provide information that will help stakeholders make better investment decisions. The study sheds new insight into the impact of CAMEL variables on the share price of banks in sub-Saharan Africa.

Introduction

As a component of the financial system, banks play a vital role in the development of nations worldwide (Said & Tumin, 2011; Umer et al., 2021). The banking sector is regarded as the financial industry's backbone since it promotes the effective use of capital (Dang, 2011). When it comes to a nation's overall economic growth, banks are crucial players. They pool the people's idle savings and make them accessible for investment purposes. In addition, they generate new demand for deposits via the provision of loans and the purchase of investment securities. They are acknowledged globally as economic development and job creation drivers, ultimately helping to sustain a financially healthy and stable economy (Saini & Sindhu, 2014; Sathyamoorthi et al., 2017).

The performance of a financial institution is assessed on three levels: management, regulatory, and external rating agencies. The purpose of the regulatory and supervisory assessment is to monitor the bank's internal performance and compliance with regulatory standards to keep the bank on track. The general public has limited access to the outcome of these assessments, as they are highly confidential. Banks are examined and evaluated by independent rating organisations, which assign ratings to the banks so that the general public and investors may make informed decisions. Both regulatory and external ratings need to reach the same conclusion regarding an institution's performance and condition to offer investors and management accurate information (Balasundaram, 2008; Maude & Dogarawa, 2016; Onwere & Owualah, 2022).

The Asian crisis and some significant company failures at the start of the decade cast doubt on the adequacy of these ratings. The implosion of mortgage-backed securities, which had repercussions on other financial markets and a worldwide recession, provided the impetus for further criticism. For example, Enron's investment rating was BBB- four days before its formal bankruptcy in 2001, even though knowledge concerning its troubles had been accessible for months. In 2002, the agencies

assigned WorldCom an investment rating two months before its bankruptcy; in 2003, they did the same for Parmalat eighteen days before bankruptcy (Rafailov, 2011).

In 1979, the Federal Financial Institutions Examination Council (FFIEC) introduced the CAMEL supervisory grading system. It is a scoring system for on-site bank inspections. Banks are evaluated based on the framework's components, which include Capital adequacy, Asset quality, Management, Earnings, and Liquidity, using a scoring system that ranges from one to five for each of the framework's components. The highest ranking is 1, indicating the best performance, while the lowest ranking is 5, indicating the worst performance. The sum of the scores is regarded as an indicator of a bank's overall health. The composite ratings use the numbers "1", "2", "3", "4", and "5" to denote "strong," "satisfactory," "fair", "marginal," and "unsatisfactory," accordingly (Maude & Dogarawa, 2016; Gebregiorgies, 2021).

CAMEL is becoming an increasingly important tool for evaluating bank performance, although the results of empirical studies on the connection between CAMEL ratings and bank performance have been mixed (Babu & Kumar, 2017; Rahman & Slam, 2018; Boateng, 2019; Raiyani, 2020; Onwere & Owualah, 2022). For instance, Mariam and Mergu (2019) examined the effect of the CAMEL framework on the performance of 15 listed Ethiopian banks from 2012 to 2017. The bank's performance was measured by return on assets and equity. The findings show that capital adequacy has a significant positive effect on return on assets but a significant negative effect on return on equity. Asset quality and managerial efficiency significantly negatively affect the return on assets and equity. The earning quality and liquidity have no significant effect on the return on assets and equity.

Nguyen (2021) used the Generalized System Method of Moments (SGMM) to investigate the determinants of 35 Vietnamese banks' performance from 2009 to 2020. The bank performance was proxied by Tobin's q. The findings show that capital adequacy, managerial efficiency, earning quality, and liquidity significantly

positively impact performance. However, a significant negative relationship exists between asset quality and performance.

Selvaraj and Devi (2022) investigated the impact of the CAMEL framework on performance for a sample of 10 Indian private banks from 2011 to 2019. The bank's performance was measured by return on equity (ROE). The results show that capital adequacy and earning quality have a significant positive impact on performance. Asset quality and liquidity have a significant negative effect on performance. However, there is no significant relationship between managerial efficiency and performance.

There are few cross-national studies on the effect of CAMEL variables on performance (Wang et al., 2013; Calice, 2014; Hadriche, 2015; Desta, 2016; Wanke et al., 2016; Munir & Bustamam, 2017; Ab-Rahim et al., 2018; Antoun et al., 2018). To the best of our knowledge, the study will be the first in the context of Sub-Sahara Africa to use the most recent data, including the crisis period of 2012 and 2013, to investigate the relationship between CAMEL variables and share prices. Moreover, because the results of previous studies have been contradictory, the effect of CAMEL on a bank's performance remains a subject of investigation. As a result, this research aims to close this knowledge gap through effective analysis.

 The objective of the study is to analyse the effect of CAMEL variables on the share prices of listed banks in the Sub-Saharan African countries of Kenya, Nigeria, and South Africa. while the specific objectives of the study are to:

I.   Examine the impact of capital adequacy on the share prices of publicly traded African.

II. Analyze the effect of asset quality on the share prices of publicly traded African banks.

III. Examine the impact of management efficiency on the share prices of publicly traded African banks.

IV. Evaluate the effect of earnings quality on the share prices of publicly traded African banks.

V. Determine how liquidity affects the share prices of publicly traded African banks.

Banks are the pillars of the financial sector, allowing the efficient usage of a nation's financial resources. The banking industry is seeing rapid expansion and a massive influx of investment. In addition to engaging in financial intermediation, banks operate in a continually innovative business that compels them to provide increasingly specialized financial services to meet their clients' evolving demands (Getahun, 2015). In order to effectively, responsibly, economically, and sustainably deal with the complexity and variety of risk exposure to the banking system, it is essential to examine the overall performance of banks by building a regulatory banking supervisory framework. One such metric of supervisory information is the CAMEL rating system.

This research is crucial because it examines bank performance using the CAMEL model and provides supervisors and managers of African-listed banks with vital information. In addition, it illustrates the relevance of the CAMEL model for risk managers, and anybody interested in evaluating the performance of banks.

It is also anticipated that the research would help stakeholders make better investment decisions and aid banks in assessing and re-evaluating their performance using the study's parameters.

The study also acts as a reference and a starting point for anyone who wants to do more research on the subject. In addition, it enables all stakeholders to learn about the CAMEL paradigm.

Literature Review

Components of CAMEL

Capital Adequacy (CAR)

The term capital adequacy refers to the sufficiency of the bank's own funds (capital) that are accessible to sustain the bank's activity and serves as a buffer in the event of an unfavourable circumstance or any shock. It is evaluated using the capital adequacy ratio (CAR). CAR demonstrates the bank's internal resilience to endure losses throughout a crisis (Desta, 2016). Capital adequacy is necessary for maintaining depositor trust and averting bank failure. It influences a bank's overall performance (Reddy, 2012; Kulshrestha & Srivastava, 2022). In this analysis, equity-to-total-asset ratio is used as a proxy for capital adequacy. Muhmad and Hashim (2015) posited that equity-to-total-asset ratio measures a bank's overall financial health and long-term profitability, assuring investors that the bank's shares are a safe investment. Kosmidou et al. (2006) stated that banks with a high equity-to-assets ratio were less likely to fail. The greater the equity-to-asset ratio, the lower the chance of bank failure. Studies employed different proxies to measure capital adequacy, as shown in Table 1.

Table 1: Capital adequacy measures used in the literature.

CAMEL Attributes	Measurement	Source
Capital Adequacy	Equity / Total Assets	Ghazavi and Bayraktar (2018) Sezal (2021)
	(Tier 1 Capital + Tier 2 Capital)/ Risk-Weighted Asset	Umer et al. (2021) Kulshrestha and Srivastava (2022)
	Total Advances/Total Assets	Rastogi and Singh (2017) Raiyani (2020)

Source: The authors' compilation

Asset Quality

The quality of a commercial bank's assets may be used to determine its degree of financial stability. The guarantee of asset quality is regarded as a core bank

requirement. The danger of loan losses owing to a rise in non-performing loans is one of the greatest threats commercial banks faces. Non-Performing Loans are loans that are in default or are imminently in default (Rahman & Slam, 2018). The decision made by banks about the assignment of deposited cash impacts the quantity of credit risk and default risk. Consequently, this component of bank assessment goals may be accomplished by analysing banks' asset quality, including loans and securities (Tabatabaei, 2011; Onwere & Owualah, 2022) . In this study, loan loss provision-to-total loans are used as a proxy for asset quality. According to Wirnkar and Tanko (2008) and Muhmad and Hashim (2015), loan loss provision-to-total net loan illustrates a bank's capacity to weather further losses on the sum of all its net loans. The greater the value, the weaker a bank's financial position. As shown in Table 2, studies used several proxies to measure asset quality.

Table 2: Asset quality measures used in the literature.

CAMEL Attributes	Measurement	Source
Earnings Quality	Net Profit/Total Assets	Rahman and Slam (2018) Kulshrestha and Srivastava (2022)
	Net Profit/Total Equity	Rahman and Slam (2018) Ledhem and Mekidiche (2020)
	Loan Loss Provision/ Total Net Loans.	Muhmad and Hashim (2015) Alebachew and Venkateswarlu (2019)

Source: The authors' compilation

Managerial Efficiency

Management quality is the capacity of managers to detect and control the risks associated with a bank's operations and to guarantee regulatory compliance in the efficient execution of banking activities (Echekoba et al., 2014). Because management

is responsible for making crucial decisions and establishing the vision and goals that govern a company's operations, many people believe that management effectiveness is an essential component of the CAMEL grading system (Altan et al., 2014). Management efficiency hinges on specified management standards, management competencies to adjust to changing environments, administrative skills, and leadership (Aspal & Dhawan, 2016; Thisaranga & Ariyasena, 2021). In this study, asset turnover is used as a proxy for management efficiency. According to Lad and Ghorpade (2022), asset turnover quantifies how rapidly a bank's assets are turned over via its revenue, including interest and non-interest income. It assesses a bank's capacity to earn revenue from its assets efficiently. The greater the ratio, the more effectively the bank uses its assets to create money. Studies employed different proxies to measure managerial efficiency, as shown in Table 3.

Table 3: Management efficiency measures used in the literature.

CAMEL Attributes	Measurement	Source
Management Ability	Expenses/ Income Ratio	Thisaranga and Ariyasena (2021) Kulshrestha and Srivastava (2022)
	Asset Turnover	Kulshrestha and Srivastava (2022) Lad and Ghorpade (2022)
	Employees/Total Revenue	Samuel (2018) Ghazi and Tayachi (2021)

Source: The authors' compilation

Earnings Quality

An institution's earnings quality is determined by its effectiveness and efficiency in asset and liability management. Earnings performance should improve, thus instilling trust in depositors, investors, creditors, and the general public. The capacity to fund present and future bank activities depends on earnings and profitability (Shar et al., 2010; Muhmad & Hashim, 2015). Commercial banks have two primary sources of

income: interest income and non-interest income. Banks' primary profit source is the interest income generated from providing money to private firms (Thisaranga & Ariyasena, 2021). The on-interest income is generated from fees and levies for providing other financial services. Examples include deposit and transaction fees, insufficient funds fees, yearly fees, monthly account service charges, inactivity fees, cheque and deposit slip fees, and so on (Wang'ondu, 2017). As shown in Table 4, studies used several proxies to measure Earnings quality.

Table 4: Earnings quality measures used in the literature.

CAMEL Attributes	Measurement	Source
Earnings Quality	Net Profit/Total Assets	Rahman and Slam (2018) Kulshrestha and Srivastava (2022)
	Net Profit/Total Equity	Rahman and Slam (2018) Ledhem and Mekidiche (2020)
	Net interest income/ Total Assets	Alebachew and Venkateswarlu (2019) Abebe (2022)

Source: The authors' compilation

Liquidity

A bank's liquidity refers to its ability to quickly and easily disburse funds to fulfil short-term financial demands. Banks must be able to respond to depositors' and facility users' needs to earn the public's confidence. Financial institutions require an effective system for managing assets and debts to achieve this. This allows them to reduce the inapplicability of asset and debt due dates and maximise their return (Ebrahimi et al., 2017). In this study, loan-to-deposit ratio is used as a proxy for liquidity. Nguyen (2021) stated that the number of loans a bank has made in relation to deposits defines the degree of liquidity risk it has taken. An increase in the loan-to-deposit ratio indicates that a bank is experiencing liquidity concerns. This ratio

demonstrates a bank's capacity to cover depositor withdrawals by depending on loans as a source of liquidity. The greater the loan-to-deposit ratio, the lesser the ability of bank liquidity. As shown in Table 5, studies used several proxies to measure liquidity.

Table 5: Liquidity measures used in the literature.

CAMEL Attributes	Measurement	Source
Liquidity	Loan/Deposit	Getahun (2015) Ghazavi and Bayraktar (2018)
	Liquid Assets/ Total Assets	Ledhem and Mekidiche (2020) Altay (2021)
	Total Loans/ Total Deposits	Muhmad and Hashim (2015) Ghazavi and Bayraktar (2018)

Source: The authors' compilation

Empirical Review

For a sample of 37 Kenyan commercial banks from 2007 to 2011, Kongiri (2012) examined the influence of CAMEL variables on bank efficiency using the ordinary least squares (OLS) approach. The efficiency ratio was used to measure the bank's efficiency. The results showed that capital adequacy, earnings, and liquidity significantly and negatively influenced bank efficiency. In contrast, management quality and asset quality have a significant positive impact on bank efficiency.

Ifeacho and Ngalawa (2014) examine the influence of CAMEL factors on bank performance for four commercial banks listed on the Johannesburg Stock Exchange (JSE) from 1994 to 2011. To analyse the data, they applied the fixed-effect estimation approach. The performance of the banks was measured by return on assets (ROA) and return on equity (ROE). The findings show that asset quality, management quality, and liquidity significantly and positively affected ROA and ROE. Capital

adequacy has a significant positive impact on ROE and a significant negative effect on ROA.

From 1996 to 2014, Iheanyi and Sotonye (2017) investigated the influence of CAMEL factors on bank performance for a sample of twenty-one (21) commercial banks listed on the Nigerian Exchange Group (NGX). The ordinary least squares estimate technique was used to analyse the data. The results show that capital adequacy, managerial efficiency, earnings, and liquidity have an insignificant influence on bank performance. A significantly negative correlation exists between asset quality and bank performance.

Kiruja (2018) investigated the association between CAMEL characteristics and the performance of eleven listed Kenyan commercial banks from 2014 to 2017 using a fixed effects estimating approach. The performance of the banks was measured by earnings per share. The results show that capital adequacy, asset quality, managerial efficiency, earnings, and liquidity have no impact on bank performance.

The effect of CAMEL factors on the share prices of twelve commercial banks listed on the Nigerian Exchange Group (NGX) from 2011 to 2020 was examined by Onwere and Owualah (2022). The data was analysed using the fixed effect estimating method. The study showed that capital adequacy, earnings, and asset quality have no significant impact on share prices. In contrast, management effectiveness and liquidity significantly impact share prices negatively.

Research Methodology

Sampling Technique and Sources of Data

The study population includes forty Kenyan commercial banks, twenty-four Nigerian commercial banks, and eighteen South African commercial banks. The study's sample size was determined using the purposive sampling method. The sample comprises twelve Nigerian banks, nine Kenyan banks, and five South African banks. The study

employs secondary data from 2011 to 2020. The data is collected from yearly reports and accounts of the sampled of commercial banks.

Model Specification

The study used the model developed by Mariam and Mergu (2019), which assessed the relationship between the financial performance and the CAMELS rating model of listed Ethiopian banks. The model is specified as follows:

$$DECP_{it} = \beta_0 + \beta_1 EQTA_{it} + \beta_2 LLPV_{it} + \beta_3 ATRN_{it} + \beta_4 GRPM_{it} + \beta_5 LTDR_{it} + \beta_6 FSIZ_{it} + e_{it} ..(1)$$

Where:

DECP	=	Share Price
EQTA	=	Capital Adequacy
LLPV	=	Asset Quality
ATRN	=	Management Efficiency
GRPM	=	Earnings Quality
LLDR	=	Liquidity
FSIZ	=	Firm Size (Control Variable)
β_0	=	Constant
β_1- β_6	=	Slope Coefficient
μ	=	Stochastic disturbance
i	=	i^{th} firm
t	=	time-period

Table 6: Measurement of Variables

Variables	Measurement	Source
Share Price	Total of the daily closing share price divided by the number of trading days	Syafii et al. (2020) Onwere and Owualah (2022)
Capital Adequacy	Equity to Total Asset	Ghazavi and Bayraktar (2018) Sezal (2021)
Asset Quality	Loan Loss Provision/ Total Net Loans.	Muhmad and Hashim (2015) Alebachew and Venkateswarlu (2019)
Management Efficiency	Asset Turnover	Kulshrestha and Srivastava (2022) Lad and Ghorpade (2022)
Earnings Quality	Gross Profit Margin	Nariswari and Nugraha (2020) Onwere and Owualah (2022)
Liquidity	Loan to Deposit Ratio	Getahun (2015) Ghazavi and Bayraktar (2018)
Firm Size	Log of Total Assets	Saka (2018) Saidu and Lawal (2020)

Source: The authors' compilation

Findings and Discussion

Descriptive Statistics

Table 7: Descriptive Statistics

COUNTRIES	VARIABLES	MEAN	SD	MIN	MAX	NO OBS
COMBINED SAMPLE						
	DECP	76.59	174.26	0.50	1432.65	260
	EQTA	11.99	15.44	-154.75	23.90	260
	LLPV	-3.27	30.68	-494.02	2.04	260
	ATRN	0.10	0.08	0.02	1.27	260
	GRPM	60.31	16.43	-90.46	96.28	260
	LTDR	78.94	43.75	3.55	696.03	260
	FSIZ	6.85	0.62	5.55	8.28	260
KENYA SAMPLE						
	DECP	67.12	72.31	3.25	335	90
	EQTA	15.56	2.16	7.03	20.38	90
	LLPV	0	0	0	0	90
	ATRN	0.09	0.02	0.02	0.13	90
	GRPM	67.04	13.87	7.54	92.65	90
	LTDR	91.82	66.78	47.38	696.03	90
	FSIZ	6.40	0.30	5.55	6.97	90
NIGERIA SAMPLE						
	DECP	9.24	10.70	0.50	47.95	120
	EQTA	9.67	22.08	-154.75	23.75	120
	LLPV	-6.61	44.98	-494.02	2.04	120
	ATRN	0.09	0.05	0.04	0.55	120
	GRPM	59.18	11.10	28.19	83.67	120
	LTDR	65.40	19.87	3.55	138	120
	FSIZ	6.82	0.38	5.71	7.42	120
SOUTH AFRICA SAMPLE						
	DECP	255.28	326.91	20.74	1432.65	50
	EQTA	11.14	5.43	5.95	23.90	50
	LLPV	-1.16	2.89	-13.23	1.07	50
	ATRN	0.11	0.18	0.03	1.27	50
	GRPM	50.91	24.53	-90.46	96.28	50
	LTDR	88.26	14.73	19.16	114.32	50
	FSIZ	7.74	0.56	6.30	8.28	50

Source: Author (2022)

The table above shows this study's descriptive statistics for the combined, Kenyan, Nigerian, and South African samples. From the table, we find that the mean share price (DECP) was 76.59 for our combined sample, 67.12 for our Kenyan sample, 9.24 for our Nigerian sample, and 255.28 for our South African sample. In the case of the independent variable, the mean of capital adequacy (C) was 11.99 for our combined sample, 15.66 for the Kenyan sample, 9.67 for the Nigerian sample, and 11.14 for the South African sample. Similarly, the mean of asset quality (A) was -3.27 for our combined sample, 0 for our Kenyan sample, -6.67 for the Nigerian sample, and -1.16 for the South African sample. The mean management efficiency (M) was 0.10 for our combined sample, 0.09 for the Kenyan and Nigerian samples, and 0.11 for the South African samples. The result implies that the management of our sample South African banks was slightly more efficient than those in Nigeria and Kenya.

The mean of earnings (E) was 60.31 for our combined sample, 67.04 for our Kenyan sample, 59.18 for our Nigerian sample, and 50.91 for our South African sample. This shows that the sample Kenyan banks were more profitable than the sample Nigerian and South African banks. Liquidity (L), we find that the mean was 78.94 for our combined sample, 91.82 for our Kenyan sample, 65.40 for our Nigerian sample, and 88.26 for our South African sample. This indicates that our sample Kenyan banks were more liquid than those in South Africa and Nigeria. In terms of our control variable, the table demonstrates that the sample South African banks (7.74) were bigger on average than those in Nigeria (6.82) and Kenya (6.40).

Correlation Analysis

We examined the association between the variables using the Spearman correlation coefficient (correlation matrix), and the results are presented in Table 8 below.

Table 8: Correlation analysis

SAMPLES	VARIABLES	DECP	EQTA	LLPV	ATRN	GRPM	LTDR	FSIZ
COMBINED SAMPLE								
	DECP	1.00						
	EQTA	0.10	1.00					
	LLPV	0.48	0.11	1.00				
	ATRN	-0.21	0.47	-0.00	1.00			
	GRPM	0.19	0.60	0.05	0.25	1.00		
	LTDR	0.33	-0.04	0.27	0.05	-0.18	1.00	
	FSIZ	0.25	-0.38	-0.20	-0.61	-0.15	-0.06	1.00
KENYA SAMPLE								
	DECP	1.00						
	EQTA	-0.02	1.00					
	LLPV	0.00	0.00	1.00				
	ATRN	-0.34	0.03	0.00	1.00			
	GRPM	-0.04	0.23	0.00	0.01	1.00		
	LTDR	-0.35	0.06	0.00	0.29	-0.40	1.00	
	FSIZ	0.14	0.04	0.00	-0.19	0.46	-0.54	1.00
NIGERIA SAMPLE								
	DECP	1.00						
	EQTA	0.40	1.00					
	LLPV	0.17	-0.03	1.00				
	ATRN	-0.47	0.11	-0.22	1.00			
	GRPM	0.57	0.48	-0.14	-0.17	1.00		
	LTDR	-0.07	0.14	0.07	0.28	-0.01	1.00	
	FSIZ	0.67	0.14	0.12	-0.52	0.41	-0.07	1.00
SOUTH AFRICA SAMPLE								
	DECP	1.00						
	EQTA	0.63	1.00					
	LLPV	0.26	0.02	1.00				
	ATRN	0.76	0.64	0.15	1.00			
	GRPM	0.21	0.59	-0.27	0.34	1.00		
	LTDR	-0.10	-0.21	-0.29	-0.08	-0.27	1.00	
	FSIZ	-0.53	-0.39	0.03	-0.73	-0.30	-0.03	1.00

Source: Author (2022)

In the case of the correlation between CAMEL variables and share price, the above results show that there exists a positive association between share price and capital adequacy for our combined sample (0.10), Nigerian sample (0.40), and South Africa sample (0.63). However, we find a negative association between share price and Capital adequacy for our Kenya sample (-0.02). There is also a positive association between share price and asset quality for our combined sample (0.48), Nigeria sample (0.17), and South African sample (0.26). The table shows a negative association between share price and managerial efficiency for our combined sample (-0.21), Kenya sample (-0.34), and Nigerian sample (-0.47). However, we find a

positive association between share price and managerial efficiency for our sample in South Africa (0.76). There is a negative association between share price and earnings for our combined sample (-0.04) and Kenya sample (-0.04). However, the table shows a positive association between share price and Earnings for our sample in Nigeria (0.57) and South Africa (0.21). Similarly, the table shows that there is a negative association between share price and liquidity for our sample in Kenya (-0.35), Nigeria (-0.07), and South Africa (-0.10). However, we find a positive association between share price and liquidity for our combined sample (0.33). In the case of our control variable, the table shows that there is a positive association between share price and firm size for our combined sample (0.25), Kenya sample (0.14), and Nigeria sample (0.67). We find a negative association between share price and firm size in our South African sample (-0.53).

Regression Analysis

Table 9: Combined and Specific Country Regression Result

Panel: Regression Results of CAMEL Rating												
	Combined Sample			Kenya Sample			Nigeria Sample			South Africa Sample		
	DECP Model (Pool OLS)	DECP Model (Fixed Effect)	DECP Model (Random Effect)	DECP Model (Pool OLS)	DECP Model (Fixed Effect)	DECP Model (Random Effect)	DECP Model (Pool OLS)	DECP Model (Fixed Effect)	DECP Model (Random Effect)	DECP Model (Pool OLS)	DECP Model (Fixed Effect)	DECP Model (Random Effect)
C	-559.71 {0.000} ***	-1797.39 {0.000} ***	-602.71 {0.001} **	122.82 {0.547}	-336.09 {0.062}	-300.13 {0.080}	-18.56 {0.395}	-93.77 {0.052} **	-69.89 {0.019} **	-123.71 {0.922}	-5278.97 {0.003} **	-123.71 {0.922}
EQTA	0.76 {0.334}	-1.31 {0.030} **	-0.42 {0.500}	-0.69 {0.851}	0.66 {0.709}	0.74 {0.672}	0.01 {0.837}	-0.05 {0.269}	-0.04 {0.354}	50.22 {0.002} **	-21.18 {0.271}	50.22 {0.001} **
LLPV	1.02 {0.013} **	0.78 {0.002} **	0.84 {0.003} **	0 {-}	0 {-}	0 {-}	-0.09 {0.102}	0.02 {0.534}	0.01 {0.818}	61.89 {0.000} ***	245.16 {0.000} ***	61.89 {0.000} **
ATRN	1340.29 {0.000} ***	669.40 {0.000} ***	807.73 {0.000} ***	-967.68 {0.045} **	527.12 {0.079}	471.81 {0.105}	105.96 {0.031} **	15.76 {0.667}	-1.80 {0.962}	464.38 {0.005} **	352.81 {0.004} **	464.38 {0.003} **
GRPM	0.32 {0.569}	0.25 {0.618}	0.23 {0.656}	0.15 {0.826}	0.36 {0.381}	0.32 {0.423}	0.45 {0.000} ***	0.07 {0.350}	0.14 {0.071}	-0.07 {0.950}	0.39 {0.630}	-0.07 {0.950}
LTDR	0.13 {0.499}	-0.25 {0.071}	-0.17 {0.266}	-0.09 {0.436}	-0.11 {0.032} **	-0.11 {0.028} **	-0.02 {0.635}	-0.07 {0.021} **	-0.06 {0.043} **	-1.55 {0.360}	-0.53 {0.686}	-1.55 {0.355}
FSIZ	68.85 {0.000} ***	267.38 {0.000} ***	88.82 {0.000} ***	6.90 {0.828}	51.41 {0.042} **	46.85 {0.049} **	1.69 {0.579}	15.01 {0.028} **	11.10 {0.008} **	-2.50 {0.986}	750.59 {0.001} **	-2.50 {0.986}
F/Wald Stat.	26.31 (0.00)	17.85 (0.00)	98.39 (0.00)	1.17 (0.33)	2.53 (0.04)	12.01 (0.03)	10.58 (0.00)	1.66 (0.14)	17.04 (0.01)	30.70 (0.00)	25.70 (0.00)	184.21 (0.00)
R-Squared	0.38	0.32	0.27	0.07	0.14	0.14	0.36	0.09	0.08	0.81	0.80	0.61
VIF Test	1.43			1.27			3.90			5.60		
Heter. Test	121.68 (0.00)			0.06 (0.81)			25.85 (0.00)			36.55 (0.00)		
Hausman Test		1.81 (0.94)			1.44 (0.92)			2.45 (0.80)			36.85 (0.00)	

Source: Author (2022)

The table above represents the results obtained from the panel regression. The result from the fixed-effect analysis will be used if the Hausman test's P-value is less than 0.05 and a random effect if otherwise. The Hausman test p-value [0.94 for our combined sample, 0.92 for Kenya, 0.80 for Nigeria, and 0.00 for the South Africa sample]. The Hausman test reveals that we will use the random-effect panel regression results for the combined, Kenya and Nigeria samples to draw our recommendations and conclusions. In contrast, the South African sample will use a fixed-effect regression.

The R-squared value was 27% for the combined sample, 14% for the Kenya sample, 8% for Nigeria, and 80% for the South Africa sample. The F-statistic value [98.39 for the combined sample, 12.01 for the Kenya sample, 17.04 for the Nigeria sample, and 25.70 for the South Africa sample] with their associated P-value shows that the models are statistically significant at the 1% and 5% levels, respectively. In addition, we do several post-regression tests to confirm the model's validity. As seen in the table above, the mean VIF value for all models is within the benchmark value of 10, indicating a lack of multicollinearity and that no independent variable should be deleted from the model.

Interpretation of Regression Analyses

Capital Adequacy: The findings showed an insignificant relationship between capital adequacy and the share prices of the combined banks (P-value = 0.500> 0.05), Kenyan banks (P-value = 0.672 > 0.05), Nigerian banks (P-value = 0.354> 0.05) and South African banks (P-value = 0.271> 0.05). Our results agree with the findings of Itumo (2013) and Moh'd Al-Tamimi and Obeidat (2013), who found an insignificant relationship between capital adequacy and bank performance.

Asset Quality: The results showed a significant positive relationship between asset quality and the share prices of the combined banks (beta = 0.84, P-value = 0.003 < 0.05) and South African banks (beta = 245.16, P-value = 0.000 < 0.05). However, an insignificant relationship exists between asset quality and the share prices of

Nigerian banks (P-value = 0.818> 0.05). There was no loan loss provision for our Kenya sample during the period under study. Our result shows that increasing the quality of assets of listed banks in sub-Saharan Africa will increase their share prices. This increase in share price due to asset quality is significant for South African banks but insignificant for Nigerian banks. Echekoba et al. (2014), Sathyamoorthi et al. (2017), and Thisaranga and Ariyasena (2021) found no significant relationship between asset quality and bank performance while Ifeacho and Ngalawa (2014) found a significant relationship between asset quality and bank performance.

Managerial Efficiency: The findings reveal a significant positive relationship between managerial efficiency and share prices of the combined sample (beta = 807.73, P-value = 0.000 < 0.05) and South African banks (beta = 352.81, P-value = 0.004 < 0.05). Nonetheless, managerial efficiency has no significant impact on the share prices of Kenyan and Nigerian banks (beta = 471.81, P-value = 0.105 > 0.05). Nguyen (2021) found a significant positive relationship between managerial efficiency and bank performance while, Selvaraj and Devi (2022) found no significant relationship between managerial efficiency and bank performance.

Earnings Quality: The results show that earnings quality has an insignificant effect on the share prices of the combined sample (P-value = 0.656 > 0.05), Kenyan banks (P-value = 0.423 > 0.05), Nigerian banks (P-value = 0.071 > 0.05), and South African banks (P-value = 0.630 > 0.05). Earnings quality does not significantly affect the share prices of listed banks in selected Sub-Saharan African countries. Our results agree with the findings of Ishaq et al. (2016) but contradict those of Onwere and Owualah (2022).

Liquidity: The findings reveal that liquidity has an insignificant effect on the share prices of the combined sample (P-value = 0.266 > 0.05) and South African banks (P-value = 0.686 > 0.05). However, we found that liquidity has a negative and significant influence on the share prices of our Kenyan (beta = -0.11, P-value = 0.028 < 0.05) and Nigerian banks (beta = (beta = -0.06, P-value = 0.043 < 0.05). Ping and Kusairi (2020)

found a significant negative relationship between liquidity and bank performance while, Thisaranga and Ariyasena (2021) found an insignificant relationship between liquidity and bank performance.

Conclusions

This study analysed the effect of CAMEL variables on the share prices of listed banks in the Sub-Saharan African countries of Kenya, Nigeria, and South Africa. The study population consists of forty Kenyan commercial banks, twenty-four Nigerian commercial banks, and eighteen South African commercial banks. The study's sample size was determined using the purposive sampling method. The sample includes 12 Nigerian banks, 9 Kenyan banks, and 5 South African banks. The analysis uses secondary data spanning the years 2011 through 2020. The empirical results from this study are mixed. Our study shows that capital adequacy has an insignificant influence on the share prices of our combined, Kenya, Nigerian and South African sample of listed banks.

The asset quality has a significant positive effect on the share prices of listed banks in our combined and South African samples. Specifically, our results imply that an increase in the quality of assets of listed banks in Sub-Sahara Africa will increase their share prices. This increase in share price due to asset quality is significant for South African banks but insignificant for Nigerian banks. Also, we find that managerial efficiency significantly affects the share prices of listed banks in selected Sub-Saharan African countries. Specifically, our results show that the increased managerial efficiency of listed banks in Sub-Sahara Africa will increase their share prices. This increase in share price due to managerial efficiency is significant for South African banks but insignificant for Nigerian and Kenya banks. Earnings have an insignificant influence on share prices of our combined, Kenya, Nigerian and South African sample of listed banks. Our findings reveal that liquidity does not significantly influence bank share prices of our combined and south African samples.

However, liquidity significantly negatively impacts bank share prices in Kenya and Nigeria samples.

Recommendation

Based on the findings, we recommend that

I. The financial institutions devise comprehensive strategies to ensure that their capital steadily rises over time, evaluate their bad loans, and define the extent to which bad debt may be converted into equity.

II. Bank liquidity should be carefully maintained to prevent imbalances. Since liquidity directly correlates with profitability, banks should maintain a professional approach to their management.

III. In addition, we argue for increasing management efficiency, which would assist banks in sub-Saharan Africa increase their overall financial performance.

Suggestions for further Study

I. This research examines the influence of internal variables (CAMEL framework) on the share prices of listed African banks. Future studies should investigate the influence of external variables, such as inflation, exchange rate, GDP, etc., and internal factors on the performance of banks.

II. The research was limited to three African countries, and its findings apply to Kenya, Nigeria, and South African banks. They cannot be applied to banks in other nations with distinct legal, institutional, structural, or cultural characteristics. In this line, future research may concentrate on North African countries.

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