Journal of Finance and Investment Analysis, Vol. 15, No. 2, 2026, 1-19
ISSN: 2241-0988 (print version), 2241-0996(online)
https://doi.org/10.47260/jfia/1521
Scientific Press International Limited

Effect of Asset Quality and Liquidity on Financial Performance of Commercial Banks in Kenya

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Abstract

The object of the study was to assess the effect of asset quality and liquidity on financial performance of commercial banks in Kenya. The study deployed explanatory research design using panel data. The period covered was 13 years from 2010 to 2022. Secondary data were mined from individual banks' published audited financial reports and also from annual reports published by the Central Bank of Kenya. A total of 38 commercial banks licensed in Kenya as at December 31st, 2022 were covered under census. Both descriptive and inferential statistics analyses were generated using Stata Soft Ware version 17.0 and Microsoft Excel. Regression analyses were applied to test the hypothesis. Tables and figures were used for data presentation. Based on the findings, asset quality had a statistically significant but negative impact on financial performance. Liquidity, on the other hand, indicated positive but non-statistical significance on financial performance. However, cumulatively, both factors had a statistically significant influence on financial performance. For a bank to survive in the current tempestuous financial climate, the management has to put more emphasis on credit ratings before issuing loans to clients. In addition, the regulatory authorities should relentlessly pursue stringent liquidity policies. All the recommended procedures are in line with the Anticipated Income Theory. This study contributes immensely to the prominence roles credit risk and liquidity risk management framework play in commercial banks' operations.

Keywords: Asset Quality, Liquidity, Financial Performance, Commercial Banks.

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Article Info: *Received:* January 29, 2026. *Revised*: February 18, 2026.
Published online: February 23, 2026.

1. Introduction

Assets of commercial banks comprise among others; the current assets, permanent assets, credit portfolio, and other investments. The major banks' assets more often than not however, are the loans that generate the lion's share of their revenue (Muriuki et al. 2019). So, the quality of loan portfolio determines the quality of assets a bank possesses. The utmost risk facing the banking sector is the emergent losses derived from delinquent loans. Consequently, the best proxy of the quality of assets is the ratios of nonperforming loans. It is in the best interest of banks to keep these ratios at the lowest levels in order to improve their financial performance. Thus, asset quality ratio is considered the right indicator for evaluating a bank's current and future viability under CAMEL rating model and commands a significant recognition (Rani & Zergaw, 2017). Theoretically, an increase of impaired loans is negatively associated with liquidity since bad loans lead to illiquid assets (Agbo and Nwude, 2018). Consequently, a bank with a large chunk of impaired loans will tend to reduce its lending activities until the negative trend is reversed.

Liquidity determines a bank's financial stability or lack of it in the eyes of depositors, investors, and borrowers. To better able fulfil their obligations, banks need to be liquid enough to discharge their liabilities (Muriuki et al., 2019). The viability of commercial banks depends upon their liquidity standing which may be either short term and hence referred to as cash flow position or otherwise referred to as solvency in the long run. Liquidity is intrinsically linked to banking performance. Strong liquidity position is considered a fundamental guarantee to the strength of financial institutions and especially so in the banking sector (Assfaw, 2019). The risk associated with liquidity can be explosive by causing untold damage to the bank's reputation built over time and cripple operations by destroying irreparably good customer relationships (Agbo and Nwude, 2018). Therefore, banks should hold sufficient funds to honour their liabilities as they mature and at the same time observe the contemporary reserve ratio requirements consonance with the set goals of monetary policy. Reserve ratio is a measure of liquidity prescribed by the monetary authorities—in Kenya, it is within the purview of Central Bank of Kenya (CBK).

Lending by commercial banks exposes them to credit risk due to problems of adverse selection and moral hazards. By committing funds to diverse sectors of the economy, the risk intensifies and this has been recognised by singling out banks for special protection through regulations and supervision of the banking sector (Muriuki et al., 2019). Therefore, financial stability and economic growth is synonymous with sound and profitable banking sector as this enables banks to weather both internal and external shocks. On the other hand, threats of insolvency in the system have the potential to cripple the whole sector. The aftermath of the financial crisis of 2007-2009 left many financial institutions scathed since they misunderstood the potential risk posed by liquidity mismanagement (Assfaw, 2019). Liquidity position is a function of many potent factors. Internal factors are those which are readily encountered and controllable by the banks' management.

The capital of an otherwise a viable bank may be affected in the long run by its earning ability in case there are no retained earnings to boost its capital base (Chibole et al. 2022). This is what led to the failure of Imperial Bank and Chase Bank in Kenya after a persistent perennial negative return on assets (ROA) due to poor investment decisions. Capital therefore acts as a buffer for the bank since it avails liquidity which is not susceptible to bank-run like deposits whose disaffected owners may withdraw on demand at the slightest distress (Muriuki et al. 2019). Therefore, capital acts as a safety net in the event of adverse developments.

There are 38 commercial banks (CBs) in Kenya according to Directory of commercial banks as reported by Central Bank of Kenya (CBK) for the year ended 31st December, 2022. Banks are under close scrutiny by the regulators since their failure has both financial cost and social repercussions to the host government and its people. CAMEL rating model is often used by regulators in the assessment of performance and ranking of banks worldwide (Tanim-Ul-Islam and Ashrafuzzaman, 2015) and this is also true in Kenya. In this study, the model rating factors of asset quality and liquidity have been used. In Kenya, CBs are divided into three peer groups(sizes) namely; large, medium, and small respectively, using a weighted composite index (CBK, 2022). "The index consists of net assets, customer deposits, capital and reserves, number of deposit accounts and number of loans". A large bank has a weighted composite index of 5% and above and a medium one index is between 1% and 5%. A bank with a weighted composite index of less than 1% is considered small. The large, medium, and small commercial banks command of market share is; 75%, 16.3%, and 8.6% respectively. In profit terms; large, medium, and small commercial banks show the following percentages; 86%,12%, and 2% in that order. In the year ended December 2022, CBs recorded impressive performance by posting a profit before tax of ksh. 240.4 billion compared to 197.0 billion in 2021. This represented; ROA and ROE at 3.7% and 26.3% respectively. Asset Quality ratio improved from 14.1 % to 13.9% in 2021 and 2022 respectively. In the years 2017 and 2018, Asset quality ratio was between 12.3% and 12.7% correspondingly and thus there seems to be a relentless deterioration over time. Liquidity ratio stood at 50.8% in 2022 as compared to respectively; 56.2% in 2021, 54.5% -2020, 49.7% -2019, 48.6% -2018, 43.7% 2017 and 40.3% -2016. The decreased liquidity in year 2022 versus liquidity in 2021 was attributed to decrease in balances with foreign banks and CBK and also the reduced investment in government treasury bills.

1.1.1 Asset Quality

The core earning assets in commercial banks comprise loans and advances (Assfaw,2019). Loans granted to customers are collected from depositors and hence liquidity reduction from a bank and may take long to recover or might be lost if proper vetting was not done. Hence, there is an inverse relationship between loan growth and liquidity. So, asset quality influences liquidity as it determines the quality of loan portfolio a bank holds. It further strengthens the ability of the bank to settle its obligations when due by providing a timely liquidity capacity. An

increase in impaired loans result into a decrease in liquidity and therefore a bank facing such scenario will have to reduce its lending operations to reverse the trend (Agbo and Nwude, 2018). Therefore, asset quality has an influence on bank profitability since it is a major portion of bank revenue though in equal measure exposes the bank to losses arising from delinquent loans (Kamande et al., 2016).
Bank risk may be classified as; credit risk, liquidity risk, market risk, and operational risk (Rahman et al., 2020). Each risk relates to the prospect that the expected net return would not be realized. This section concentrates on credit risk. Credit risk is the primary cause of bank failures as it incorporates the quality of bank assets or the probability that a borrower will default. Before granting a loan, a borrower is subjected to credit analysis that endeavours to weed out potential default. In case of default, bank's cash flows interrupt temporarily or permanently causing financial distress. Financial measures of credit risk focus on the quality of loan portfolio because loans exhibit the highest default rate. Loans whose contracted interest and principal payments have not been honoured for the last 90 days are branded non-performing. Provision for loan losses are made to cover potential losses which due to time lag may camouflage the correct extent of the problem when a bank gets into trouble. Agbo and Nwude (2018) used ratio of impaired loans to total loans not different from Assfaw (2019) who defined it by loan loss provision to total loans. The lower the loans loss provision to total loans ratio, the better. This is the approach adopted in this study.

1.1.2 Liquidity

Asset liquidity refers to the ease with which an asset can be converted into cash with least loss of value. Liquidity risk refers to the variation of earnings caused by illiquidity during times of need (Agbo and Nwude, 2018). Liquidity risks increase the likelihood of default which degenerates into non-performing loans and hence poor financial performance. Liquidity management entails dealing with fundamental dynamos that causes ripples and keeps cash levels in a state of flux. Liquidity takes a centre stage in working capital management which is all about management of short-term investment and financing of operations. Liquidity management seeks to address the lags in cash collections caused by delayed customers' payments and obsolete inventory. It may also manifest in earlier settlements of liabilities or reduction of credit line by a lender. Viewed from another perspective, the primary sources of liquidity include but not limited to; cash balances--cash and cash equivalents, short term financing such as trade credits and overdraft facilities, and proper cash flow management that synchronizes receipts and payments. Adequate liquidity is associated with bank profitability while excess of it denotes an opportunity cost (Muriuki at et al., 2019).
There are many causes of illiquidity suggested as possible explanations that should be on the watch list. One such cause is attributable to mob psychology in which group of people behave like herds of animals, unaware, heading for slaughter (Agbo and Nwude, 2018). In such situations, clients may anticipate financial crisis and act

in conformance by mass withdrawals in order to avoid losses. Another scenario occurs due to normal business cycle arising from strong emotional commotion to economic principles. The last one is ascribed to economic rounds of recessions and depressions accompanied by reductions in asset values. Given the dynamics of all these disturbances, borrowers may default, depositors may withdraw their funds, culminating into insolvency of banks due to systemic connections. However, unless there is widespread crisis, banks can still survive by inter bank borrowing or reprieved by lender of last resort--Central bank. Another notable cause of lack of liquidity is exposure to delinquent loans which result into losses and low profits (Muriuki at et al., 2019). Accordingly, non-performing loans have led to banks failures since a significant income is generated from interest charged on these loans and any disturbance upsets the income streams.

Liquidity ratios are classified into two types, namely; current ratio and quick ratio. These are defined depending on the speed of cash realizability operations (Agbo and Nwude,2018). Current ratio measures the ability of an entity to settle its current liabilities by applying current assets. Quick ratio on the other hand matches an entity's current liabilities with its most liquid assets. Different ratios have been used to proxy liquidity such as; client deposits to total assets, total loans to client deposits, loans to total assets, etcetera (Chibole et al. 2022, Rahman, 2020, Muriuki et al., 2019, Assfaw, 2019, Al-Gazzar, 2014), and Youssef & Samir, 2015, etc.). High liquidity can be a source of both blessings and a curse at the same time (Rani & Zergaw, 2017). A blessing if it is kept under rational conditions that does not deter earnings since idle cash does not command any income but represents opportunity cost arising from excess funds that could be profitably invested elsewhere (Muriuki et al., 2019).

Liquidity ratios have however faced criticism due to their stationarity as they are calculated at a point in time assuming all factors constant but in reality, such a metric fails given the fluidity of cash items (Agbo and Nwude, 2018). Despite the deficiencies exhibited by ratios, they serve as a theoretical guide of the cash position at a given point of time. Consequently, this study has zeroed in on loans to total assets ratio as a metric for measurement of liquidity (Al-Gazzar, 2014, and Youssef & Samir, 2015). The higher the ratio, the lower the liquidity and the reverse is true. Naturally, as loans to total asset ratio increases, liquidity reduces and this increases interest payments from the loans advanced and hence an improvement in financial performance.

1.1.3 Financial Performance

Performance is defined as the efficient utilization of a firm's limited resources that produces high outputs in comparison to inputs (Pintea & Achim, 2013). Financial performance is often the main objective for the existence of any commercial bank as it leads to increased equity value for its shareholders and improved quality to its clients (Al Zaidanin, 2020). More over, banks' financial performance is a subject of many variables which may be macroeconomic or legal in nature and keep on

changing. Studies have shown that profitability is a reliable source of liquidity (Assfaw, 2019). Therefore, information about financial performance and survival of commercial banks come from their liquidity position and profitability levels. However, studies have shown mixed results, with others finding that liquidity has a positive relationship with profitability while others establish disputing findings (e.g. Mbella and Magloire, 2017). Asset quality has also been shown to have the highest influence on profitability of banks and thus banks should adopt an efficient and effective management of them to avoid insolvency (Kamande et al., 2016).

One of the significant factors affecting banking operational efficiency is risk management (Rahman et al., 2020). Failure to conduct credit risks assessment can easily result into a financial disaster. Consequently, poor liquidity and weak asset quality are recipes for banking failure. These combine to exert a lot of pressure on the management and eventually leads to portfolio diversification geared towards risk mitigation. The risks involved can be split into credit risk (weak asset quality) and liquidity risk. Whenever credit and liquidity risks persist, this is conveyed into unpaid loans, and hence poor returns. Ultimately there will be a deterioration in profitability. This corroborates the economic theory of the natural association between profitability and risks. Hence the higher the liquidity levels the better the returns and long-term sustainability of profits. In this perspective, asset quality and liquidity are normally imbedded in bank specific determinants of profitability.

Mbella and Magloire (2017) found a negative significant effect of liquidity on ROA and explained that it was due to an increased loan to deposit ratio which in turn generated a greater portion of loans thereby reducing liquidity and resulting into profits consequent upon interest charged on loans. Further, the inverse relationship between asset quality and profitability is consistent with the risk-return concept in which riskier investments are compensated with premium returns and the reverse is true.

The common metrics popular with analysts in the measurement of profitability are return on assets (ROA) and return on equity (ROE) (Trung, 2021). ROA measures the efficient utilization of a firm's limited resources to generate income. ROE on the other hand compares the income with the owners' equity. It is relied upon by the investors in their decisions to either invest or disinvest in a firm. This study will rely on ROA as a measurement tool for profitability because it has been found to be more reliable than ROE (Al Zaidanin, 2020).

1.2 Research Problem

To understand the factors behind commercial banks' financial performance one has to investigate the internal factors as a prelude. These are the immediate most variables that affect banks' performance going forward. These factors are often derivatives of CAMEL rating framework namely; capital adequacy, asset quality, management efficiency, earning ability, and liquidity. Studies differing in scope are oscillating around these variables. However, depending on approach and context, different outcomes have been generated but no consensus reached. Some studies

approached liquidity as a dependent variable (Assfaw, 2019, Agbo and Nwude, 2018), some studies found negative contributions of asset quality and/or liquidity (Rahman et al., 2020 and Mbella and Magloire, 2017), while some reported no significant effect of liquidity on profitability (Muriuki et al. (2019). Controversially, Kamande et al. (2016) found a positive influence of asset quality on profitability. Although all the studies referred to internal factors (bank specific factors), only Mbella and Magloire (2017) and Kamande et al. (2016) were faithful to CAMEL rating factors as others used different indicators, and thus were bound to come up with varying results. Further, some studies were done outside Kenya's context (Rahman et al., 2020, Assfaw, 2019, Agbo and Nwude, 2018, Mbella and Magloire, 2017). Just like in many under developed worlds, banks research in Kenya is still rudimentary. Therefore, research in this area still attract interest from many quarters including; banks, investors, lenders, borrowers, academicians, and a plethora of economic entities. Consequently, this study fills the contextual and conceptual gaps still left to be plugged.

1.3 Research objective

The general objective of the study was to determine the relationship among asset quality, liquidity, and financial performance of commercial banks in Kenya. Specifically, the object was to assess the effect of asset quality and liquidity on financial performance of commercial banks in Kenya.

1.4 Value of Study

Banking institutions operate in an industry full of risks that should be continuously managed for better financial performance. This study targets the catalyst of many banking failures. Asset quality and Liquidity are embedded with risks, namely; credit risk and liquidity risk. No bank has ever failed without falling prey to these two predators. Hence this study illuminates safety pathways necessary to avoid the pitfalls. Bank assets identified in these areas would be kept under microscope. Consequently, there could be concerted efforts towards proper credit analysis to avoid bad loans by conducting proper vetting of potential borrowers. Similarly, based on the findings, bank liquidity position would be continuously monitored through dedicated resources. Regulatory authorities will stand advised on the threats posed by the duo factors. The findings will also bolster the current body of knowledge moving forward since it synthesised by deploying a narrower scope with three factors namely, asset quality, liquidity, and financial performance. Further research could also be triggered using similar or different theoretical framework.

2. Literature Review

2.1 Theoretical Framework

The theory is relevant to asset quality particularly with regard to loaning and also liquidity risk with which many a financial institution grapple.

2.1.1 Anticipated Income Theory

This theory was developed by Prochnow in 1940s based on the act of extending credit to US commercial banks. The covenant binds and restricts the financial activities of the borrower (Prochnow, 1949). Accordingly, banks design their term-credit in such a way that it coincides with the borrower's income streams. In that way, a bank considers a borrower's foreseen income plus the collateral. However, this theory relates loan repayment to profits than to relying on the security. The theory takes into account that some loans are more liquid than others. By applying this theory, the loans are usually paid by instalments and thereby alleviating any bank liquidity crisis. In case illiquidity persists, this can be eased by the bank resorting to selling the loans to access cash in secondary markets. The theory has advantages of liquidity, safety, and profitability to the bank, while at the same time beneficial to businesses due to medium-term fundings. The theory's critiques however, portray that it does not meet the threshold of a theory but merely an analysis of creditworthiness. They also claim that it fails to meet the emergency cash needs of the borrowers. Be it as it may, this theory fits this study well which dwells in liquidity and asset quality, considering that liquidity and credit risks are the main challenges facing commercial banks.

2.2 Conceptual Framework

This is a schematic plot depicting the relationships between and among various variables in the study (Cooksey& McDonald, 2019). This study is anchored on the Anticipated Income theory Figure 1 presents the conceptual framework.

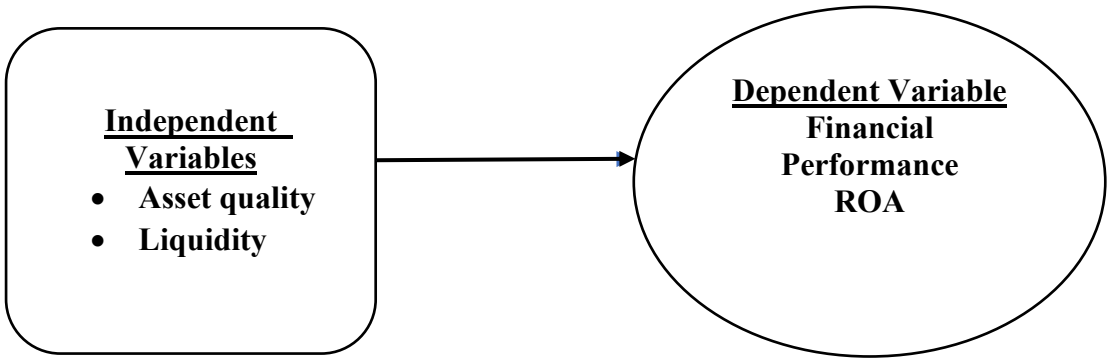

Figure 1: Conceptual Model

Source: Author, 2025

2.2.1 Null Hypothesis

$H_{01:}$ Asset quality and liquidity have no significant effect on the financial performance of Commercial banks

2.2.2 Empirical Literature Review

Rahman et al. (2020) investigated the effect of internal factors and macroeconomic factors of profitability for the banking sector of Pakistan. They employed Arrellano-Bond framework and panel data covering the years 2003 to 2017. Their research established that capital adequacy had a positive effect on financial performance of Pakistani banks. In the contrary, liquidity, business mix pointers, interest rates, and industrial production influenced profitability negatively. Further, it was reported that liquidity risks enhanced the likelihood of loans default and hence unpaid loans leading to poor profits. Consequently, liquidity position cannot be taken for granted as the study has shown and that is what the current study intends to investigate together with issues surrounding loans and their effect on profitability.

In a study aimed at examining internal factors and macroeconomic factors which affect liquidity of privately owned banks in Ethiopia, Assfaw (2019, pp. 123) revealed that bank specific factors which included "bank size, loan growth, and deposits were significant determinant of banks' liquidity". The study further indicated that "interest rate margin, national bank bills purchase, GDP, and annual inflation", all influenced the liquidity position of the banks in question. The study stated that both internal and external factors were key determinants of liquidity position and thus should be taken into consideration in strategy formulation. The study puts more emphasis on the contribution of liquidity to profitability similar to Rahman et al. (2020). Interestingly, there is no consensus on the two results due to dissimilar economic spheres, regulations, and data sets.

Muriuki et al. (2019) delved into studying how bank specific factors affected financial performance of commercial banks in Kenya in a study that covered 11 years (2007-2017). Using correlation and multiple regression analyses, the study found that bank specific factors explained 89.3% of financial performance of commercial banks in Kenya. Accordingly, capital adequacy, management efficiency, and liquidity had no significant effect on financial performance of listed commercial banks. Conversely, they confirmed that asset quality and risk management had statistically significant effect on financial performance of the commercial banks studied. The study posted mix results as it did not find any significant effect of liquidity on profitability while Rahman et al. (2020) found a significant effect though, negative.

Agbo and Nwude (2018, pp.6659) in their study investigated the relationship between bank specific factors and liquidity of commercial banks in Nigeria. The study exposed that 'total capital ratio, impaired loans on total loans, return on equity and banking assets over total banking sector assets have negative and statistically insignificant effect on bank liquidity at 5% significance level while return on assets and interest expenses over deposits had positive and statistically insignificant

impact on bank liquidity". The study approached liquidity as a dependent variable while the current study however deploys asset quality and liquidity as independent factors.

Studying the effect of bank specific factors on performance of Afri-land First Bank in Cameroon, Mbella and Magloire (2017) applied Generalised Methods of Moments and established that capital adequacy, liquidity, and asset quality had a significant negative effect on ROA while management efficiency was significant but positive to ROA. The resultant outcome is mix as compared to Muriuki et al. (2019) who found no significant effect in most of the variables on financial performance except asset quality and risk management. However, this study was similar to Rahman et al. (2020) on liquidity.

Kamande et al. (2016) investigated internal factors and financial performance of CBs in Kenya. They covered a 5-year period between 2011 and 2015. They sampled 11 CBs and established that internal factors in deed affected profitability of the banks significantly. In addition, their study revealed that capital adequacy had gone down considerably during the period under study. They resolve that asset quality was influencing financial performance of CBs positively. The result controverted prior studies in terms of the direction of influence (positive) of asset quality on financial performance which had been consistently negative (Rahman, et al., 2020, and Mbella & Magloire, 2017).

As seen in the preceding paragraphs, there was no consensus on both asset quality and liquidity influence on profitability of banks. No doubt, asset quality plays a significant role in liquidity and its management presents a major challenge to banks and the regulatory authorities keen to monitor the banking loaning system and the attendant risks. Liquidity risk on the other hand is subject to uncountable dynamics, though loans to clients feature prominently. That being the case, it is only prudent to isolate and grant them prominence in a study such as this. Additionally, there were both contextual and conceptual differences in the prior studies which invited further research.

3. Research Methodology

The philosophical research approach adopted in this study is positivism which leads to accurate data where cause and effect relationships can be established similar to scientific methods where generalizability is possible (Saunders et al., 2009). Explanatory research design has been chosen because of its appropriateness in testing relationships between variables and the ability to draw inferences about causality (Kothari, 2004). The population of the study comprised all the 38 commercial banks licensed in Kenya as at December, 2022, according to the Central Bank of Kenya (CBK) supervisory annual report by then. Secondary data were collected from the annual published financial statements of commercial banks in Kenya as well as from the Bank Supervision Annual Reports published by CBK, covering a 13-year period from 2010 to 2022, purposively selected as being more representative. The data were mined and captured in data sheets, processed and

regressed using stata software version 17.0. The targeted variables are presented in table 1 and their operationalization.

Table 1: Operationalization of Variables

Bank Factor	Variables	Metrics	Representation	Source
Dependent Variables	Profitability Ratios	Return on assets=PBT&EI/Total Assets	ROA	Tanim-Ul-Islam and Ashrafuzzaman (2015) and Nakhaei & Hamid (2013)
Independent Variables	Assets Quality (AQ)	Loans Loss Reserve/Total Loans	LLR	Youssef & Samir (2015)
	Liquidity Quality (LQ)	Loans/Assets	LAR	Al-Gazzar (2014) and Youssef & Samir (2015)

(Source: Adopted from Youssef and Samir, 2015)

4. Data Analysis and Interpretation

4.1 Descriptive Statistics

To understand the statistical properties of the dataset, descriptive statistics were generated and the resultant output analysed which gave measures of central tendency such as; mean, standard deviation, minimum, and maximum. The summary statistics is reproduced in table 2.

Table 2: Descriptive Statistics for variables

Summarize Variable	Observations	Mean	Std. Dev	Min	Max
Year	414	16.73913	3.601797	10	22
PBTEI	414	4775046	8545292	-2929676	5.98e+07
Total Assets	414	1.30e+08	2.03e+08	261309	1.55e+09
Total Loans	414	6.94e+07	1.12e+08	118652	8.63e+08
Loan loss Reserve	414	4238567	8916345	0	7.15e+07
Bank Panel ID	414	18.80193	11.26779	1	38

The year's mean is 16.7±3.6 with a maximum and minimum of 10 and 22 respectively. On Profit Before Tax and Extra Ordinary Items (PBTEI), the mean is 4,775,046 ±8,545,292 showing a wide variability around the mean as evidenced by the value of the standard deviation. The total assets show a mean of 130 million and a standard deviation denotes a significant spread of between 200 million to 1.55 billion. The Total Loans range from ksh. 118,652 to ksh. 863.3 million revealing how values are significantly spread as evidenced by a mean of 69 million and a standard deviation of 110 million. Loans Loss Reserve has a range of between 0 to 7.1, a mean of 4.2 million and a spread of ksh 8.9 million according to the standard deviation. The table also shows 38 banks with a mean of 18.80 and a standard deviation of 11.27.

4.2 Diagnostic Tests

There are assumptions of linear regression models that have to be met for robust results. Consequently, a number of diagnostic tests were conducted to ensure that the assumptions were met. These tests were; linearity test, normality test, multicollinearity test, independence test, and heteroscedasticity test. The results of the diagnostic tests are presented in table 3 to 5 and in figure 2.

4.2.1 Linearity Test

Table 3: Linearity Test Result

Source **Model** **Residual**	**SS** **.00454701** **.011109292**	**Df** **5** **33**		**MS** **.000909402** **.00336645**	**No. Obs=39** **F (5,33) = 2.70** **Prob>F=0.0374** **R-squared=0.2904** **Adj R-squared=0.1835** **Root MSE=0.01835**	
Total	.015656301	38		.000412008		
ROA	Coefficient	Std err.	t	P>/t/	95% conf.	Interval
Asset Quality	-.03107773	.1347915	-2.31	0.028	-.5850127	-.0365419
Liquidity	-.0478026	.0795013	-0.60	0.552	-.2095493	.113944
_cons	.0125421	.0465177	0.27	0.789	-.0820988	.107183

The p-value > f =0.0374 is less than the critical value (f<0.05) hence, the data assumes linearity. The overall model of (f (5,33) = 2.70) attests to the significance level and therefore existence of linear relationship between the dependent variables and the explanatory variable. Accordingly, the linearity assumption is upheld.

4.2.2 Normality Test

Table 4: Normality Test results

Shapiro-wilk w test for Normal Data					
Residuals	Observation	w	v	z	Prob>z
	39	0.966640	1.303	0.555	0.28929

Table; shows Shapiro-wilk *w* statistic output ranging from 0—1, with 1 ascribing perfect normality. At *w=0.96640*, there is enough evidence that the sample assumes normal distribution. The p-value is greater than 0.05, so there is no enough evidence to reject the assumption of normal distribution.

4.2.3 Independence Test

Table 5: Test Result

.0529276	0	1	0	0	0	0	0	1
.0548836	0	0	1	0	0	0	0	1
.0574986	0	0	0	0	0	1	0	1
.0589913	0	0	0	0	1	0	0	1
.0852553	0	0	0	0	0	0	1	1
Total	1	1	1	1	1	1	1	39

Pearson chi2(1444) = 1.5e+03 Pr = 0.238

The table displays chi-square output. The hypothesis was that there was no connection between two categories of variables and hence p-value of 0.238 significant level failed to satisfy the fact at 0.05 universal threshold. Therefore, the hypothesis was rejected.

4.2.4 Heteroscedasticity Test

Homoscedasticity refers to the assumption of equivalent or comparable variances or a graphical random pattern. Lack of it (heteroscedasticity) leads to "higher errors" (residuals) for some portions of the range compared to others (Garson, 2012). Heteroscedasticity is most easily visualized in graphed standardized scatter plots. Homoscedasticity assumption is met when residuals patterns are formless clouds of dots.

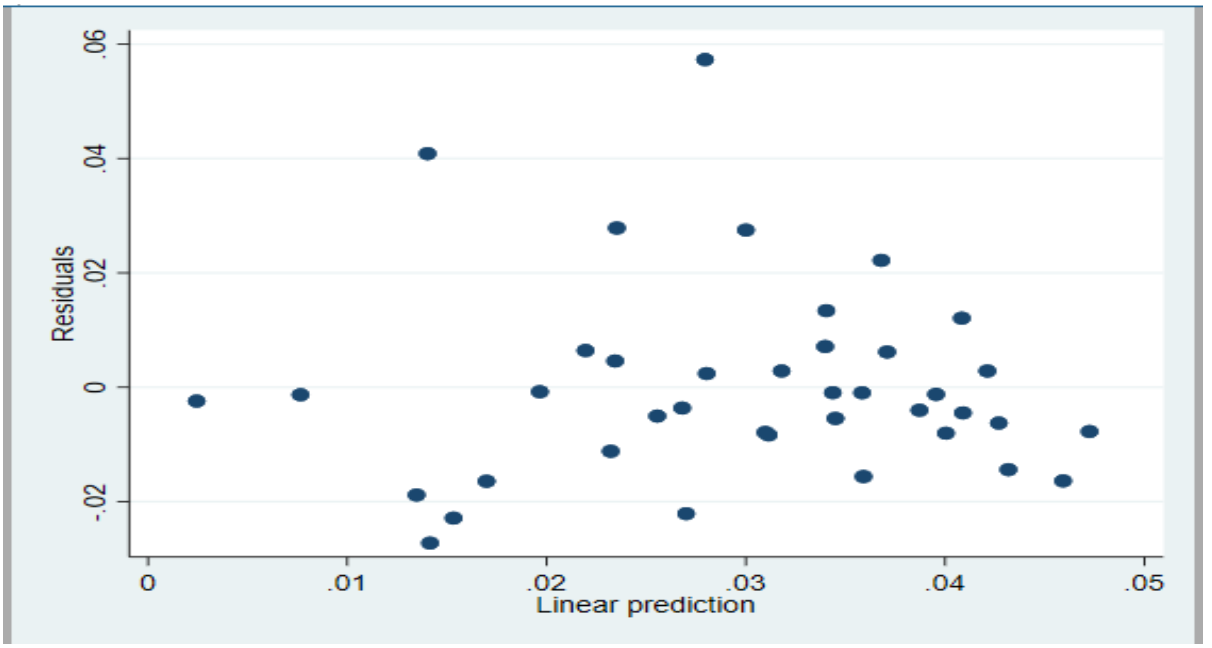

Figure 2: QQ Plot --Heteroscedasticity Test Result

Figure 2 depicts the spread of the residuals which appear to increase slightly with the linear predictions. Though there is a slight increase in spread, there doesn't appear to be any systematic structure in the residuals. This indicates that the model captures most of the underlying trend in the data well. Thus, the presence of Heteroscedasticity is refuted.

5. Hypotheses Testing and Discussion

5.1 Asset Quality, Liquidity, and Financial Performance of Commercial Banks

Multiple regression model was used to test the hypothesis that asset quality and liquidity have no significant effect on the financial performance of Commercial banks. The objective was to assess the effect of asset quality and liquidity on financial performance of CBs in Kenya.
The equation to test for the relationship was:

$$Xit = \alpha 1 + \beta 1 AQit + \beta 2 LQit + \varepsilon \quad (1)$$

Where;
Xit represents performance as conveyed by ROA for bank *i* at time *t*
α = Intercept
AQ*it* = Asset Quality of bank *i* at time *t*
LQit = Liquidity of bank *i* at time *t*
$\beta 1 - \beta 2$ = Coefficients of regression relations
Eit = Error term where *i* is longitudinal and *t* is the time identifier

Table 6: Regression output

Source	**SS**	**Df**		**MS**	**No. Obs=39**	
Model	**.00454701**	**5**		**.000909402**	**Min=13**	
Residual	**.011109292**	**33**		**.00336645**	**Avrg=13**	
					Max =13	
					F(4,32)	
					Prob>F=0.0138	
					R-squared	
					between=0.8887	
Total	.015656301	38		.000412008		
ROA	**Coefficient**	**Std err.**	**t**	**P>/t/**	**95% conf.**	**Interval**
Asset Quality	-.2296937	.0748722	-3.07	0.004	-.3822033	-.0771841
Liquidity	.0307422	.052254	0.59	0.560	-.0756958	.1371802
_cons	.0434654	.0254777	1.71	0.098	-.008431	.0953619

The positive coefficient indicates that as liquidity increases so does financial performance. In the contrary, as asset quality decreases ROA increases, thus there is an inverse relationship between the two variables. However, the influence of asset quality is statistically significant at p-value>0.05=0.004. Liquidity p-value=0.560 shows non-significant effect on ROA.

The linear regression model is fitted thus: $ROAit = 0.435 - 0.23AQit + 0.031LQit$

The model shows asset quality as having a negative effect on financial performance while liquidity has a positive influence on financial performance. However, cumulatively, the factors are statistically significant as shown (f =3.70 and p= 0. 0138).

From the analysis, asset quality which was proxied by loans loss reserve ratio, is an important factor that banks are compelled to properly manage by carrying out stringent credit analysis in order to avoid delinquent loans. Consequently, as asset quality improves (as loan loss reserve goes down), financial performance picks up for the better. Hence, this explains the negative correlation between the asset quality and financial performance (Rahman et al.,2020 and Mbella and Magloire, 2017). This conforms with standard economic concept. Conversely, Kamande et al. (2016) in Kenya found a positive influence of asset quality on profitability.

As liquidity decreases (or as loan to asset ratio goes up) so does financial performance. This finding opposes what obtains in Kenya's banking sector. One can argue that too much liquidity presents opportunity loss to a bank because excess cash should have been prudently invested elsewhere (Muriuki at et al.,2019). In Kenya, generally commercial banks over complied by the reserve ratio imposed by the regulator. While the statutory reserve ratio stood at 20%, the banks had an

average ratio of 50.8% in the year 2022, way above the prudential requirement according to Central Bank of Kenya (CBK) annual report of 2022. Therefore, commercial banks in Kenya might as well be under performing and therefore take notice that the excess cash they seem to hold is curtailing their profitability. Other studies however, found an inverse relationship between liquidity and financial performance (for example; Rahman et al.,2020 and Mbella and Magloire, 2017) which indeed corroborates the known economic concepts.

6. Conclusions, Recommendations, and Limitations

6.1 Conclusions

Based on the findings, asset quality which was proxied by loans loss reserve ratio, was an important factor that banks should manage by carrying out vetting processes before advancing loans to potential borrowers. This is likely to assist in avoiding future delinquent loans. Consequently, as asset quality improves (i.e. loan loss reserve declines), financial performance expands. This therefore explains the negative correlation between the asset quality and financial performance confirmed in this study. Conversely, when this ratio approaches high levels, the danger of a bank failure begins to loom. Accordingly, profitability and survivability of a bank are endangered once accumulated loans degenerates into non-performing loans. Asset quality in this study has proven to be a major factor in financial performance and mishandling it can plunge a commercial bank into a financial catastrophe.

The study conforms to predictions as it indicates that as liquidity reduces (loan to assets ratio increases), so does profitability. It is a common accounting concept that idle cash generates no income. This however, often occurs owing to lack of viable investment opportunities or management inefficiency in seeking out investment options. Therefore, the study resolves that when excess cash is beneficially invested, it spurs profitability but whenever a bank is too liquid it denies them the opportunity to profit, grow, and survive. This is the reasoning behind banking operations.

6.2 Recommendations

The management of commercial banks should take seriously vetting of clients and background credit rating analysis to ensure healthy loaning regimes in which delinquent loans are avoided. As advanced in the anticipated income theory, loan repayment instalments should be matched with income streams from the borrowers. In addition, loans should be secured on viable collaterals.

The regulatory authorities are encouraged to intensify their supervision and monitoring activities on loaning schemes that strictly follow all the guidelines issued. Liquidity position is another area requiring constant assessment and monitoring without which bank failure becomes inevitable.

Further studies could be duplicated in this area of asset quality and liquidity using another methodology or deploying asset quality and /or liquidity as dependable variables and bank specific factors, and ROA and/or ROE as explanatory variables. In so doing, another perspective might emerge informing policies and practice.

Indicators also vary, here asset quality was proxied by loans loss provisions to total loans. This could be expanded to include; loans to total assets, loans and advances to total deposits, etcetera. Similarly, liquidity management could also be indicated by; loans to customer deposits, customer deposits to total assets, etcetera, as opposed to loans to total assets as used in this study.

6.3 Limitations

The scope of the study was limited by the number of internal variables incorporated. Other factors could also be deployed to ensure a wider coverage. Additionally, shorter periods could be used, say between 5 and 8 years, as data for prolonged periods such as 13 years in the current study, tend to be scarce.

ACKNOWLEDGEMENTS

I would like to express my utmost appreciation to my dedicated authors who meticulously contributed to this research to its ultimate destination. I therefore take this opportunity to thank Dr. Herrick Ochieng' Ondigo and Dr. Nixon Oluoch Omoro for their invaluable inputs. My entire family also earns their rightful place.

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