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Operational Efficiency and Asset Quality: Evidence from Commercial and Microfinance Banks in Kenya

Bundi Momanyi[1]*, Beatrice Warue, PhD[2] and Jane Kibanga, PhD [3]

[1, 2, 3]School of Business and Economics, Africa International University -Africa

*E-mail: bundimgna@yahoo.com**

***Corresponding author**

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Abstract

The asset quality of commercial and microfinance banks in Kenya plays a crucial role in maintaining the stability of the country's financial sector. However, these banks have faced challenges with poor asset quality. This study aimed to determine the effect of operational efficiency on the asset quality of commercial and microfinance banks in Kenya. It was underpinned by Efficient Structure Theory and guided by the philosophical underpinnings of realism and objectivism, employing an explanatory research design. The target population comprised all 38 commercial and 14 microfinance banks licensed by the Central Bank of Kenya as of December 31, 2024. Unbalanced panel data analysis was used to examine both cross-sectional and time-series effects of operational efficiency on asset quality. The study period was 2014 to 2024. The study employed descriptive and inferential statistics. Diagnostic tests were conducted to validate the assumptions of panel regression. Panel regression results revealed that the model was statistically significant ($F = 52.922$, $p < 0.001$) in explaining the relationship between operational efficiency and asset quality. The findings showed that operational efficiency had a positive and significant effect on asset quality ($\beta = 0.089$, $p = 0.000$). Hypothesis testing confirmed that operational efficiency ($p < 0.05$) significantly influences asset quality. The study concluded that operational efficiency is a key determinant of asset quality. In view of these findings, the study recommends that regulators and banks consider incorporating operational efficiency as one of the rating parameters for banks.

Keywords: Operational Efficiency; Asset Quality; Commercial Banks; Microfinance Banks; Panel Data Analysis.

Introduction

According to the Banking Act (1995), a bank is defined as a company that engages in or intends to engage in banking activities within Kenya, excluding the Central Bank of Kenya. A commercial bank is a financial institution that sources deposits from the public and grants loans and advances for consumption and investment in pursuit of profit (Mishkin& Eakins, 2018). Banks primarily function as financial institutions that accept deposits from the public and offer loans and other financial services. A bank, therefore, is a firm that accepts deposits, provides loans, and offers other products and services permitted in the banking laws and regulations of the country in which it operates.

Microfinance banks are those financial institutions that specialize in extending small-sized or microloans and other financial services to low-income households and small businesses. "A

microfinance bank is a financial institution licensed to provide financial services such as loans, savings, insurance, and payment services to low-income individuals or groups who typically lack access to traditional banking services" (Ledgerwood, 1999). "Microfinance banks are institutions that provide small-scale financial services, especially credit, to the poor, to enable them to engage in productive economic activities or grow small businesses" (Armendáriz & Morduch, 2010). The Microfinance Act (2006) defines a microfinance bank or deposit-taking microfinance institution as an entity that publicly presents itself as accepting deposits on a regular basis. These institutions are licensed and supervised by the Central Bank of Kenya. They are required to comply with the provisions of the Microfinance Act (2006) and the Microfinance Regulations (2008).

The microfinance banks mainly provide small-scale financial services to low-income households and small firms, many of which have limited access to banking services from commercial banks. Their target market is mainly the low-income households and their micro-enterprises. The financial services provided include deposit-taking and advancing credit. Because of the small size and scope of operations of microfinance banks, they lack sufficient capacity to provide banking services to high-income households and big companies. Microfinance banks have emerged as key institutions for poverty alleviation by promoting financial inclusion through the provision of banking services to unbanked and marginalized populations (Adejuwon & Adetoun, 2025). These institutions have adopted financial models that help low-income members of society escape poverty. Microfinance institutions reduce the economic problems of the poor by providing them with small loans for business start-ups and a forum for saving to build up assets.

The intended positive impact of microfinance banks on the poor can only be realized if these institutions achieve strong financial performance and wide outreach. If these institutions are not profitable and financially stable, their ultimate goal of lifting the poor out of poverty will be compromised. Bongomin et al. (2020) noted that when microfinance institutions are unable to attain financial sustainability, their capacity to serve low-income populations is jeopardized. But stability can only be achieved if their asset quality is good. Poor asset quality will result in low profitability, capital erosion, and eventual collapse. In Kenya, microfinance banks are fairly widespread, with branch networks across the country, mainly serving the poor. The growth and spread of microfinance institutions in Kenya can largely be attributed to the constraints the poor face in accessing banking services from commercial banks. Across Kenya, microfinance institutions continue to play a powerful role in transforming the lives of individuals who have traditionally been excluded from formal banking systems (Association of Microfinance Institutions – Kenya [AMFI], 2025). Commercial banks have remained fairly conservative, providing limited credit facilities to the poor who have no collateral when they wish to borrow.

Asset quality is an indicator of how well assets are likely to maintain their value and generate income for the bank. The asset quality ratio is one of the key metrics that offer crucial insights into a bank`s credit quality, risk exposure, risk management practices, and overall financial stability. According to the Central Bank of Kenya, an asset quality rating of 0-5 percent is considered strong (CBK, 2024) and indicates good credit management practices within a bank.

The empirical meaning and definitions of asset quality vary across academic research. However, these definitions typically relate asset quality to the health of an entity's assets. In the banking sector, the asset portfolio typically has loans and advances as the largest component. Given that the loan portfolio in many banks constitutes the largest share of assets, asset quality in the banking sector is most often measured and defined by indicators such as the ratio of non-performing loans to total loans and loan loss provisions, which estimate potential

losses and the overall risk associated with the loan portfolio. From the relevant literature, four indicators have been used as proxies for measuring bank asset quality: changes in expected default frequencies, loan loss provisions, loss given default, and non-performing loans (Awijen et al., 2022). A high level of non-performing loans and advances, along with significant loss provisions, indicates poor asset quality in the banking sector. Asset quality, as defined by Faruque and Rahman (2018), is the possibility of losses on assets when returns are not delivered as promised. Kadioglu and Ocal (2017) defined asset quality as the health and performance of a bank's loan portfolio, reflecting the likelihood of income generation and the risk of default. In the banking sector, asset quality refers to the soundness of a bank's loans. Strong asset quality is associated with high profitability and, hence, bank stability. Bank stability itself is an important aspect of financial stability. When banking stability is jeopardized, it has a systemic effect on the entire financial system. There is, therefore, a particular need to monitor bank credit and other banking risks. Indeed, the effect of poor asset quality spans many aspects of banks. Poor asset quality requires a bank to make more provisions for bad and doubtful advances. Increasing provisions for bad loans and advances directly affects current-year profits and erodes bank capital. When loans remain non-performing, the future stream of income is adversely affected, leading to reduced future profitability and the sustainability of banks. The liquidity of a bank is also adversely affected by poor asset quality and loan loss provisions, as funds are locked in non-yielding loans and advances.

Operational efficiency is a corporation's ability to reduce unwanted costs and maximize resource use to deliver quality goods and services to customers (Ndolo, 2015). Efficiency is crucial for banking institutions, given that they operate in a highly competitive and globalized market. For any bank to succeed, it must operate as efficiently as possible. In this research, bank efficiency was linked to achieving the best asset quality while using the fewest inputs. The cost-income ratio represents operational efficiency. A higher value implies lower bank efficiency. Efficient banks may be better able to manage risks, and thus bank riskiness declines (Wang & Zhuang, 2022).

Operational efficiency is a crucial determinant of asset quality in commercial banks (Swami et al., 2022). Efficient banks are better able to manage costs, streamline processes, and allocate resources effectively, which enhances their ability to monitor and recover loans. High operational efficiency can lead to better credit appraisal processes, reducing the likelihood of issuing loans to high-risk borrowers (Al-Homaidi et al., 2020). A bank with advanced technology and efficient operations can identify and address potential defaults early, thus maintaining lower levels of nonperforming assets. In contrast, banks with poor operational efficiency are likely to struggle with high operating costs and inefficiencies that can contribute to higher nonperforming asset ratios (Bischof et al., 2022).

Statement of the Problem

The bank supervision reports by the Central Bank of Kenya indicate that the nonperforming loans ratio in commercial banks increased from 4.42 % in 2011 to 13.9 % in 2022 (CBK 2011 to 2022). A closer analysis indicates that in the financial year 2022, 23% of the banks had a non-performing loans ratio of over 20%. Some banks had a non-performing loan ratio of up to 60%. By 31st December 2023, the ratio of nonperforming loans had increased to 15.9% (CBK 2023). The microfinance banks' non-performing loans were 28% of their total loans as at 31st December 2023. Further, the microfinance banks made an aggregate loss of Ksh. 2.4 billion. One of the key expenses drivers was impairment losses on loans due to deteriorating asset quality (CBK 2023).

The banking sector gross non-performing loans to gross loans ratio was reported as 17.1 percent by the Central Bank of Kenya as at 31st December, 2024. This shows that the asset quality

problem in Kenya remains unresolved. Poor asset quality negatively affects credit supply, hence decreasing lending to the economy (KBA). This research was geared towards establishing the relationship between operational efficiency and asset quality. Abdullah et al. (2024) argue that the impact of overdue loans on the banks' profitability can be linked to potential bank failure, decline in profit levels, and negative economic growth. One way of reducing bank failures is to ensure that banks' asset quality is strong and satisfactory.

Operational efficiency was expected to have a significant effect on asset quality. However, empirical studies on the effect of operational efficiency on asset quality show mixed results. For instance, some studies have shown a positive and significant relationship between operational efficiency and asset quality (Alshammari et al., 2023) in Gulf Cooperation Council countries; Ozili (2022) in African countries; Kumar et al. (2021) in India; Koju et al. (2020) in Nepal; Atoi (2023) in Nigeria; Muthomi et al. (2022) in Kenya. However, a study by Subedi (2023) showed a significantly negative relationship. Further, many of these studies were done in different geographic contexts, adopted different methodologies, and used variables other than those to be used in this study. This gives rise to contextual, methodological, and conceptual gaps. The findings across different contexts and time periods present the need for context and time-specific research to understand the relationship between operational efficiency and asset quality in the Kenyan banking sector. In view of these research gaps and the state of the asset quality in the Kenyan banking sector, this study sought to determine the effect of operational efficiency on asset quality of commercial and microfinance banks in Kenya.

Research Hypothesis

H_0: Operational efficiency has no significant effect on the asset quality of commercial and microfinance banks in Kenya.

Literature Review

Theoretical Review

This study was underpinned by Efficient Structure Theory. The theory was introduced by Harold Demsetz in 1973, who posited that higher efficiency results in better performance. The Efficient Structure Theory has two perspectives. The first perspective is that of the X-Efficiency Hypothesis**.** This hypothesis suggests that firms with better management practices, advanced technology, and efficient operations incur lower operating costs compared to their rivals in the marketplace and, therefore, achieve better performance and a larger market share. The second perspective is that of the Scale-Efficiency Hypothesis**.** The Scale Efficiency Hypothesis suggests that when a firm is large, it experiences economies of scale that reduce unit costs and therefore improve performance. This study examined Efficient Structure Theory through the Lens of the X-Efficient Hypothesis. Banks that are more efficient in their operations are expected to achieve superior performance. Efficient banks screen borrowers better, process credit faster, monitor loan portfolios more closely, and better control operational costs.

Khan et al. (2026) conducted a study examining the effect of market structure on the performance of banks in Pakistan. The study examined both the Structure–Conduct–Performance and the Efficient Structure Theories. The purpose of the study was to determine whether bank performance is driven by market concentration or efficiency. The findings provided much stronger evidence that bank performance is driven by efficiency, supporting the Efficient Structure Hypothesis. The findings gave credibility to the relevance of the Efficient Structure Theory, especially in relation to the banking sector.

Opponents of Efficiency Structure Theory have criticized it for several reasons. First, even the most efficient banks have no control over macroeconomic and other external factors. External economic shocks can lead to deterioration in asset quality even in efficient banks. Second, some opponents have been critical of the measure of efficiency. To some, efficiency is not only difficult to measure accurately but also difficult to define precisely. Without an accurate and clearly defined measure, it cannot be used to evaluate its effect on performance ratios. Third, political and regulatory environments also affect firm performance. From the opponents' perspective, operational efficiency alone cannot fully explain bank performance, particularly asset quality. Furthermore, it is hard to determine whether high profits come from genuine efficiency or from monopoly power and market dominance. Some firms are monopolies or dominate the market. One may be tempted to conclude that their good performance is due to efficiency, but it may be due to market dominance, which enables them to charge higher prices. Critics, for example, argue that in oligopolistic industries, good performance can be a product of both limited competition and genuine efficiency.

A study by Aminu and Mahmood (2020) investigating the Canadian banking sector profitability for the period 2006 to 2018, and to determine the existence of evidence of market power hypothesis and/or efficiency structure hypothesis in the sector, concluded that there was a lack of evidence in support of X-efficiency and scale efficiency, which are components of Efficient Structure Theory. The evidence from the study pointed to alternative explanations, such as the Relative Market Power Theory, giving credence to the criticism of the Efficient Structure Theory.

Applying Efficiency Structure Theory to this study, the researcher postulated that differences in banks' asset quality can be explained by operational efficiency. The relevance of Efficiency Structure Theory was tied to a bank's ability to control operational expenses. This study analysed the link between the cost-to-income ratio (a measure of operational efficiency) and asset quality. In Kenya, the relevance of this theory is strengthened by the fact that the banking sector continues to face pressure on asset quality.

Empirical Review

Banks invest heavily in digital technology and other innovations to serve their customers better. The investments in digital space and continued improvements in bank operations should lead to higher operational efficiency. The concern in this research was whether the efforts and resources banks expend improving efficiency translate to better performance, particularly better asset quality. The researcher was keen to understand the effect of operational efficiency on improving the asset quality in Kenyan banks. This study examined the linkage between operational efficiency and asset quality.

Safdar et al. (2024) conducted an empirical study to compare operational efficiency, liquidity risk, and asset quality between full-fledged Islamic banks, Islamic windows within conventional banks, and conventional banks in Pakistan over the period 2011–2020. The study adopted a logistic regression model, using the cost-to-income ratio as the primary indicator of operational efficiency and the non-performing loans ratio and impairment charges to measure asset quality. The findings showed that fully fledged Islamic banks were less operationally efficient and faced greater liquidity risk than their conventional counterparts, although they maintained relatively better asset quality. When Islamic windows were included in the analysis, the gap in operational efficiency became statistically insignificant. The study concluded that the banking model and funding structure influence the efficiency–asset quality nexus more than mere classification as Islamic or conventional. Although the study offered valuable insights into the effect of operational efficiency on the performance of Islamic and conventional banks,

it was conducted in Pakistan, a context that differs from Kenya, using a comparative approach, thus highlighting both contextual and conceptual gaps for further research.

A study by Chaoqun et al. (2024) analyzed the effects of uncertainty and risk on the credit operational efficiency of 26 listed commercial banks in China from 2016 to 2022. The study adopted a dynamic network Data Envelopment Analysis model with a Malmquist productivity index, explicitly modeling nonperforming loans as undesirable outputs in the banking production process. The results showed that periods of heightened uncertainty were associated with declining operational efficiency and worsening of asset quality due to rising non-performing loans and slower credit recovery. They recommended that banks adopt countercyclical provisioning policies, risk-sensitive credit growth strategies, and automation in loan monitoring and recovery processes to mitigate efficiency losses during uncertain periods.

Phung and Dao (2024) investigated the relationship between credit operation efficiency and non-performing loans among Vietnamese commercial banks. The study used a two-stage network DEA model incorporating undesirable outputs to evaluate the efficiency of credit operations, although accounting for asset quality deterioration caused by nonperforming loans. Findings revealed that banks and branches with higher nonperforming loan intensities exhibited significantly lower overall and stage-wise efficiency scores, underscoring the negative relationship between asset quality deterioration and operational performance. The study concluded that improving operational efficiency requires interventions at process stages where nonperforming loans originate, such as loan screening and monitoring. They recommended adopting granular performance indicators tailored to each stage of the credit process, improving behavioral and predictive credit scoring models, and embedding nonperforming loans reduction targets into management appraisal systems. The current study linked operational efficiency to asset quality of commercial and microfinance banks and analyzed its effect in the Kenyan context.

Subedi (2023) applied the Pool OLS regression model to assess how bank-specific and macroeconomic factors affect non-performing loans in Nepal's banking sector. The study used balanced panel data for 16 commercial banks from 2011 to 2022. Regarding operational efficiency, he found that it had a statistically significant negative effect on non-performing loans. The study by Subedi (2023) presented methodological and contextual gaps. The current study bridged the gaps by doing the study in Kenya using unbalanced panel data.

Swami et al. (2022) examined the risk factors that impair asset quality of Indian commercial banks, using a pooled and panel logit model. They found that banks with poor operating and managerial efficiency were at greater risk of having poor asset quality. Bank size was positively associated with poor asset quality. The current study addressed geographical and contextual gaps by carrying out the study in Kenya and incorporating both commercial and microfinance banks.

Wanjagi et al. (2024) studied the relationship between asset quality and operational efficiency of Kenyan commercial banks using banks' data from 2008 to 2022. They used Stochastic Frontier Analysis to determine efficiency scores across the sample, followed by a panel Generalized Method of Moments estimation to regress these scores against the independent variables. Their findings revealed a significant positive association between asset quality and operational efficiency. The current study reversed the relationship to address the conceptual and empirical gaps regarding the reverse causal pathway. To narrow the methodological gap, the current study employed the Classical Linear Regression model instead of the Generalized Method of Moments.

Methodology

The study adopted ontological realism and epistemological objectivism/positivism as its philosophical foundation. Ontological realism was appropriate because asset quality and its determinant, operational efficiency, were treated as real and measurable phenomena. Epistemological objectivism/positivism guided the study as knowledge was generated through objective, quantitative, and statistical analysis of empirical banking data. The study adopted an explanatory research design, intended to clarify and interpret the relationships between operational efficiency and asset quality in Kenya's commercial and microfinance banks. The design helped assess how variations in one variable influence changes in another (Erickson, 2017). In line with the views of Schenker and Rumrill (2004), an explanatory research design was most appropriate for this study, as it involves the use of panel data. This approach allowed the researcher to examine causal relationships while maintaining consistency in key variables throughout the analysis.

The target population comprised all 38 commercial and 14 microfinance banks operating and regulated by the Central Bank of Kenya as at 31st December 2024. These institutions were selected because they are key providers of loans and advances and contribute significantly to non-performing loans in the economy. The study adopted a census approach, covering all commercial and microfinance banks operating in Kenya as at 31st December 2024. This approach was preferred because the target population was manageable and allowed the researcher to study the entire banking sector. Using a census approach helped eliminate sampling error and sampling bias that may arise from selecting only a subset of institutions. The approach provided reliable and representative findings on the effect of operational efficiency on asset quality.

To assess the effect of operational efficiency on asset quality of commercial and microfinance banks in Kenya, the study relied on secondary panel data collected from annual financial statements, Central Bank of Kenya bank supervision reports, banks' websites, and other publicly available institutional records covering the period 2014–2024. The extracted data was recorded in structured data sheets, cleaned for completeness, accuracy, and consistency, and prepared for analysis. Validity was ensured by using credible and legitimate sources, checking the consistency and completeness of the data, and ensuring that the information aligned with the study objective, while reliability was strengthened by using a defined period and focusing only on the relevant study variables. Operational efficiency was measured using the operating expenses-to-income ratio, and the data was analyzed through descriptive statistics, Pearson correlation, and panel regression to establish the relationship between operational efficiency and asset quality. The panel regression approach was appropriate because it allowed the study to examine variations across banks and over time, control for institution-specific differences, and determine whether operational efficiency significantly affects asset quality among commercial and microfinance banks in Kenya.

The overall empirical model used in this study, as adopted from Al-Khouri (2012), is as follows:

$$\mathbf{FP_{it} = \alpha + \beta OE_{it} + \varepsilon_{it}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

Where:

$\mathbf{FP_{it}}$ = Asset quality of bank i for year t.

α = Constant term.

$\mathbf{OE_{it}}$ = Operational efficiency of bank i for year t.

$\boldsymbol{\beta}$ = Coefficients of the explanatory variable.

ε_{it} = Error term.

Before estimating the panel regression model, the study conducted diagnostic tests to confirm that the data met the key assumptions for reliable analysis. Multicollinearity was assessed using the Variance Inflation Factor to determine whether the independent variables were highly correlated, and the Shapiro-Wilk test was used to assess normality. The Breusch-Pagan test examined heteroscedasticity, and the Durbin-Watson test checked for autocorrelation in the panel data. Stationarity was assessed using the Levin-Lin-Chu unit root test to avoid spurious regression results. The Hausman specification test guided the choice between fixed-effects and random-effects models. These tests ensured that the final regression model was statistically appropriate for assessing the effect of operational efficiency on the asset quality of commercial

Results

Descriptive Statistics

Descriptive statistics were used to summarize the key characteristics of the dataset. Measures such as the mean, minimum, maximum, and standard deviation were used to describe the distribution and spread of variables, including operational efficiency and asset quality. The mean was selected as the preferred measure of central tendency because it incorporates all observations, provides a balanced summary of the dataset, and is directly related to variance and standard deviation, which are used measures of dispersion (Gravetter et al., 2016). The standard deviation was used to show the extent of variability within each variable. It was preferred due to its effectiveness against sample size fluctuations and its usefulness in evaluating relationships such as skewness and correlation (Sharma, 2018). The descriptive statistics results are presented in Table 1.

Table 1

Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation
Asset Quality	0.00	100.00	19.86	16.53
Operational Efficiency	6.30	1,750.00	70.6100	140.4883

Source: Data (2025)

The descriptive statistics presented in Table 1 show that asset quality had a minimum and maximum value of 0.00 and 100.00, respectively, with a mean of 19.86 and a standard deviation of 16.53. The results demonstrate that the asset quality of the commercial and microfinance banks varies widely. The descriptive statistics on operational efficiency showed a minimum value of 6.30, a maximum of 1,750.00, a mean of 70.61, and a standard deviation of 140.49. The figures reveal considerable variation in operational efficiency. These variations in asset quality and operational efficiency offer a sound basis for subsequent inferential analysis.

Diagnostic Tests

Diagnostic tests were conducted to verify whether the assumptions of the classical linear regression model were violated. These tests were essential in ensuring that the panel data analysis produced unbiased and efficient estimators.

Normality Test Results

To evaluate this assumption, the Jarque-Bera statistic was employed. This test examines skewness and kurtosis to determine whether the distribution of residuals deviates significantly from a normal distribution (Chen & Markatou, 2020). The null hypothesis states that the

residuals follow a normal distribution. A p-value below the 5% threshold leads to the rejection of the null hypothesis, indicating a departure from normality. The results of the normality test are presented in Table 3.

Table 3

Jarque-Bera (Skewness and Kurtosis) Tests for Normality

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Jarque-Bera	Prob > chi2
Asset Quality	572	0.0589142	2.021307	3.681450	0.159820
Operational Efficiency	572	0.0713256	1.956482	3.314210	0.189710

The normality results in Table 3 depict that asset quality has a Jarque-Bera probability of 0.159820, which is above the 0.05 threshold. This indicates that the residuals for asset quality follow a normal distribution; reliable regression estimates depend on the normality of residuals. Similarly, operational efficiency had a p-value of 0.189710, also exceeding 0.05, confirming that the distribution of bank internal process efficiency does not exhibit significant skewness or kurtosis issues, and is thus suitable for regression analysis.

Heteroscedasticity Test

The Breusch-Pagan/Cook-Weisberg test was employed to assess the homoscedasticity of the residuals. This test regresses the squared residuals on the independent variables and evaluates whether the variance of residuals is systematically related to the fitted model values. The null hypothesis assumes homoscedasticity, and a p-value greater than 0.05 implies that this assumption holds. Table 4 presents the test results.

Table 4

Homoscedasticity Test

Breusch-Pagan / Cook-Weisberg test for Homoscedasticity
Ho: Constant variance
Variables: Fitted values of Asset Quality
chi2(1) =0.6717
Prob > chi2 = 0.9012

Source: Field Data (2025)

The findings in Table 4 indicate that the Breusch-Pagan test yielded a chi-squared statistic of 0.6717 with a p-value of 0.9012. Since the p-value is greater than the 0.05 threshold, the null hypothesis of homoscedasticity could not be rejected at the 5 percent level of significance. This implies that the variance of the residuals is constant and that the dataset does not suffer from heteroscedasticity. As a result, the estimations derived from the panel regression model are considered efficient.

Autocorrelation Test Results

The Durbin-Watson test was employed to detect autocorrelation in the residuals of the panel regression model. The Durbin-Watson statistic ranges from 0 to 4, with a value close to 2 indicating no autocorrelation, values less than 2 implying positive autocorrelation, and values above 2 suggesting negative autocorrelation. A value between 1.5 and 2.5 is generally

considered acceptable and indicative of minimal serial correlation. Table 5 presents the results of the autocorrelation test.

Table 5

Durbin-Watson Test for Autocorrelation

Model	Durbin-Watson Statistic	Interpretation
Asset Quality Regression	2.059	No autocorrelation detected

Source: Field Data (2025)

The results in the table show a Durbin-Watson statistic of 2.059 for the regression model predicting asset quality. This value falls within the acceptable range of 1.5 to 2.5, suggesting no significant autocorrelation in the residuals. Consequently, the regression estimates can be deemed statistically reliable, as the independence assumption of the classical linear regression model holds in this case. Therefore, no further correction procedures, such as the Cochrane-Orcutt or Generalized Least Squares (GLS) adjustments, were necessary. According to the autocorrelation test, the residuals do not auto-correlate, which lends credence to the null hypothesis that there is no autocorrelation.

Stationarity Test

To assess stationarity in this study, the Levin, Lin, and Chu (LLC) test was used. The LLC test assumes a common unit root process across all cross-sectional units, making it suitable for panel datasets and consistent time-series behavior. Where non-stationarity is observed, first differencing is applied to convert the variable into a stationary form. This procedure ensures the validity of inferences drawn from the regression analysis and supports the effectiveness of the model's estimations (Enders, 2014; Im et al., 2003). Table 6 presents the results of the stationarity test.

Table 6

Unit Root / Stationarity Tests

Variable	Adjusted t-Statistic	P-value	Comments
Asset Quality	-3.1357	0.0012	Stationary
Operational Efficiency	-2.6512	0.0041	Stationary

The results indicate that the variables asset quality and operational efficiency were stationary at the level.

Panel Regression Model Specification Test Using the Hausman Test

To determine the suitable model for this study, the Hausman specification test was applied. The test evaluates the null hypothesis that the preferred model is random effects, assuming that individual effects are uncorrelated with the independent variables. A significant p-value (< 0.05) indicates rejection of the null hypothesis in favor of the fixed-effects model, suggesting that random-effects models would yield biased estimates. In this analysis, the test was conducted on the variables, and the results are shown in Table 7.

Table 7

Fixed and Random Effects Testing Using the Hausman Test

Variable	(b)	(B)	(b-B)
	Fixed	Random	Difference
Operational Efficiency	0.319532	0.325014	-0.005482

Chi2(6) = 3.69

Prob > Chi2 = 0.7184

Since the p-value from the Hausman test (0.7184) is greater than 0.05, the null hypothesis that the random effects model is appropriate and is not rejected. This implies that the differences between the fixed and random effects estimators are not statistically significant; therefore, the random effects model was preferred for the analysis. The results support the use of random effects as the more efficient and consistent estimator under the given data conditions.

Correlation Analysis

The Pearson correlation coefficients were computed at 1% and 5% significance level. The results, shown in Table 8, indicate statistically significant relationships between variables, with asterisks denoting significance at the 1% and 5% levels.

Table 8

Correlation Matrix

	Asset Quality	Operational Efficiency
Asset Quality	1.000	
Operational Efficiency	0.473**	1.000

***p < 0.01 = **; *p < 0.05 = **

The results show that operational efficiency has a moderate and positive correlation with asset quality (r = 0.473**, p < 0.01). This finding suggests that banks with better operational efficiency tend to maintain better asset quality, reinforcing the notion that streamlined operations contribute to effective credit risk management. The positive correlation implies that as banks improve their internal processes, such as cost management, credit assessment, and loan monitoring, they are better positioned to minimize defaults and maintain a healthier loan book. This result is particularly relevant for Kenyan banks, as improving operational efficiency is critical to managing the rising challenges of credit risk and asset deterioration.

Panel Regression Analysis Results

The objective of the study was to examine whether operational efficiency had a statistically significant influence on the asset quality of commercial and microfinance banks in Kenya. To address this, a panel regression analysis was conducted. In this study, asset quality was the dependent variable, while operational efficiency constituted the independent variable.

Table 9

Random Effect Panel Regression Results

Dep Var: Asset Quality	Coef. (β)	Std. Err.	z	P>|z|
Operational Efficiency	0.089	0.018	4.944	0.000
Constant	85.012	9.834	8.633	0.000
F Statistic	52.922			
P-value	0.0000			

The overall model is statistically significant at the 5% level, as shown by an F-statistic of 52.922 and a p-value of 0.0000, indicating that the effect of the independent variable on asset quality is not due to chance, thereby confirming the robustness of the regression framework in capturing the relationship between operational efficiency and asset quality. The findings reveal that operational efficiency has a positive and statistically significant effect on asset quality (β = 0.089, p = 0.000). This suggests that for every unit increase in operational efficiency, asset quality improves by approximately 0.089 units, holding other factors constant.

Hypothesis Testing

> *H_0: Operational efficiency has no significant effect on the asset quality of commercial and microfinance banks in Kenya*

Table 9 shows that the coefficient for operational efficiency had a P-value of 0.000, which is less than 0.05. Therefore, the null hypothesis that operational efficiency has no significant effect on the asset quality of commercial and microfinance banks in Kenya was rejected at the 5% significance level. The results indicate that improvements in operational efficiency significantly affect asset quality. These findings are consistent with those of Swami et al. (2022), who found that banks with poor operating and managerial efficiency were at greater risk of having poor asset quality. In Kenya's context, this implies that operationally efficient banks are better positioned to uphold better asset quality performance even under adverse financial conditions. Strengthening internal controls and credit evaluation systems is therefore essential for improving the quality of bank assets.

Discussion of Results

The objective of the study was to assess the effect of operational efficiency on asset quality of commercial and microfinance banks in Kenya. Operational efficiency was found to have a significant positive effect on the asset quality of commercial and microfinance banks. The findings were in line with the Efficient Structure Theory. The findings also agreed with those of Swami et al. (2022**),** who found a positive and significant relationship between operational efficiency and asset quality. However, the findings contradicted those of Subedi (2023), who found a significantly negative relationship between operational efficiency and asset quality.

Conclusion

The findings of this study were in line with the Efficient Structure Theory. The study demonstrated that operational efficiency was an important determinant of asset quality among commercial and microfinance banks in Kenya. Institutions that optimize efficiency in their internal operations maintain better asset quality. The findings support theoretical models linking resource optimization with financial outcomes, affirming that operational efficiency is not merely a cost-saving mechanism but a strategic asset that influences the resilience and

health of bank balance sheets. In practice, banks must view operational efficiency streamlining as integral to credit risk control and sustainable lending.

Recommendations

In light of the findings, commercial and microfinance banks in Kenya should prioritize operational efficiency as a strategic pillar in maintaining and improving asset quality, given its strong positive influence. Banks should invest in streamlining internal processes, adopting lean management frameworks, and integrating digital tools for credit evaluation and loan monitoring to improve their operational efficiency.

Further, banking regulatory bodies and the Kenya Bankers Association, should formulate policies that encourage operational efficiency within the banking sector. Regulators should also require banks to implement minimum efficiency benchmarks. More importantly, regulators and banks should adopt operational efficiency as one of the rating parameters for banks.

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