The University Journal: A Doctoral Association of Eastern Africa (DAEA) Publication
Vol 7(2)

ISSN: 2519-0997 (Print)

Influence of Bank Capitalization on Intermediation Efficiency of Commercial Banks in Kenya

Abubakar Ketemon Lewano[1*], Elizabeth Kalunda[2], Francis W. Wambalaba[3]
[1,2,3]United States International University - Africa
**E-mail: aklewano@gmail.com*

***Corresponding author**

Cite: Lewano, A.K., Kalunda, E., Wambalaba, F.W. (2025). Influence of Bank Capitalization on Intermediation Efficiency of Commercial Banks in Kenya. *The University Journal, 7*(2), 33-46.

Abstract

The banking sector in Kenya exhibits a relatively low level of intermediation efficiency at 67.5%, which constrains its ability to effectively fulfill its critical role in promoting economic growth. The purpose of this study was to investigate the influence of bank capitalization on intermediation efficiency of commercial banks in Kenya. The research was grounded in the economic efficiency theory. The study adopted an explanatory sequential research design which involved use of both secondary and primary data in two phases. In the first phase, quantitative secondary data was collected from the annual financial statements of individual banks and analyzed to establish baseline relationships. This was followed by collection and analysis of qualitative primary data to help explain or elaborate on the quantitative results achieved in the first phase. Primary data was collected through an interview guide. The target population was 39 commercial banks in operation in Kenya during the study period from 2014 to 2023. A two-stage analysis was adopted. In the first stage, efficiency scores were generated using the Data Envelopment Analysis (DEA) methodology and the estimated efficiency scores were used as dependent variables in the efficiency equation. Then, Tobit regression analysis model was used to regress the computed DEA efficiency scores against bank capitalization. The study also gathered qualitative data using interviews which was analyzed using thematic summary analysis. The study found that bank capitalization has a statistically significant and positive impact on the intermediation efficiency of commercial banks in Kenya ($\beta = 0.2215$, $z = 2.71$, $p = 0.007$). The study recommends to policymakers to consider promoting the growth and consolidation of commercial banks to enhance intermediation efficiency. Further, regulators should intensify risk-based supervision to ensure that undercapitalized banks are promptly addressed to prevent systemic risks.

Key Words: Bank capitalization, Banking sector, Intermediation efficiency, Kenya.

Introduction

Financial institutions play a vital role in stimulating economic growth and development at the international, regional and national levels (Istaiteyeh et al., 2024). This role stems largely from their primary function in the capitalization of savings from which excess funds are mobilized in financing productive investments. They channel funds from surplus units to deficit units in the economy as financial intermediaries (Werner, 2015). Commercial banks' roles as financial intermediaries include accepting deposits, storage of assets and issuance of loans (Ulvi, 2023). In their intermediation function, commercial banks diversify risk, enable economies of scale and economies of scope. Commercial banks provide an avenue for individuals with excess funds to diversify their risk by lending to several borrowers instead of just one (Ullah et al., 2023). Moreover, commercial banks benefit from economies of scale by aggregating deposits from several clients and providing loans to various borrowers. In addition, commercial banks have the ability to tailor loan packages to meet the needs of both small and big borrowers when they lend money (Chowdhury et al., 2023).

Financial intermediation has existed since the inception of currency, when affluent individuals saw the need of a secure repository for their wealth. Ancient empires needed an operational financial system to enable commerce, allocate wealth, and collect taxes. Historical documents from ancient kingdoms of Rome, Greece, Egypt, and Babylon indicate that temples often served as the financial hubs of their communities and provided loans in addition to safeguarding deposit (Rathore, 2021). According to Silva (2018), intermediation efficiency is crucial because it steers saved funds toward productive uses at minimal cost, narrowing credit spreads and encouraging capital formation. When banks deploy resources well, they lower systemic risk through portfolio diversification, sound liquidity, and depositor trust, helping the economy avoid the disruptions seen in crises such as 1929 and 2007 (Cetorelli et al., 2012). Data Envelopment Analysis (DEA) is used in this study to measure intermediation efficiency by assessing how well a bank turns its resource mix into lending and investments. Arora (2014) attributes the reasons for the efficiency differences on banks to two main factors; external macroeconomic forces that influence all banks, and internal bank-specific forces. The internal factors include those aspects of the firm that are largely controlled by firm-level management. These internal factors also referred to as micro or firm-specific characteristics originate from the financial statements of the firm (Athanasoglou et al., 2008). Key among them, are bank size, credit risk, bank capitalization, bank profitability, bank liquidity and bank ownership.

Bank capitalization or capital adequacy has received considerable scholarly attention as a determinant of bank efficiency, though findings remain inconclusive. Dao and Nguyen (2020) emphasized that maintaining the required capital adequacy ratios is essential for ensuring operational efficiency in commercial banks. Similarly, Odekina et al. (2019) found that adequate capitalization not only stimulates but also enhances the operational efficiency of banks, particularly when combined with sound management practices. From a risk mitigation perspective, Lotto (2018) argued that capital adequacy contributes to financial stability by reducing moral hazard between shareholders and debt holders, thereby supporting operational efficiency. However, opposing views exist. Adusei (2016), for instance, found that capital adequacy has a negative and significant effect on technical efficiency, suggesting that excessive capitalization may lead to inefficiencies due to underutilized resources. These divergent findings highlight the need for further empirical investigation into the relationship between capital adequacy and bank intermediation efficiency, particularly within different regulatory and economic contexts.

Statement of the Problem

The continuous financial reforms in Kenya's banking industry are expected to have considerable impact on the efficiency of the banks in the country. The banking sector in Kenya has a low level of overall intermediation efficiency at 67.5%, which inhibits its crucial role in promoting economic growth (Osoro & Kiplangat, 2020). Camanho et al. (2024) attribute the reduced efficiency in banks to external macroeconomic variables affecting all banks and internal bank-specific characteristics. Understanding the impact of bank capitalization on the efficiency of the banking industry is therefore crucial to the management of commercial banks, various stakeholders and interest groups who include the regulators and the government (Andries, 2011). Although numerous studies have examined factors contributing to bank efficiency, there remains a need to expand the limited empirical evidence within the African context.

A bulk of the studies on efficiency in banking sector have been conducted in various countries in Europe, such as Grmanová and Ivanová (2018) in Slovakia and Blatter and Fuster (2022) in Switzerland. These studies left a contextual gap as they did not focus on a developing country

like Kenya which the current study seeks to fill. Besides, the study by Istaiteyeh et al. (2024) left a conceptual gap as it included factors such as return on equity, return on assets, and GDP growth, and left out bank capitalization which will be included in the current study. Further, a study in Ethiopia by Abdulahi et al. (2023) assessed the influence of capitalization, inflation on bank efficiency. The study however, left a contextual gap as it was undertaken in Ethiopia which has contextual differences in economic, political and social environment. Further, the study applied a generalized linear regression model instead of a Tobit panel regression model which would be more suited to the panel data collected.

In Nigeria, Yahaya and Awen (2020) assessed the role played by bank capitalization on efficiency, but their study had a methodological gap as it applied regression analysis rather than DEA which is more robust in assessing efficiency using various inputs and outputs. In Kenya, Omete (2023) studied the factors influencing efficiency of commercial banks, but only targeted commercial banks listed on the Nairobi Securities Exchange. The findings from the study by Omete (2023), would not therefore be generalizable to other smaller banks that are not listed. Another study by Kiemo and Kamau (2020) established that despite various policy pronouncements by the CBK and the various prudential guidelines to the banking sector, the Kenyan banking sector still experience average efficiency. The current study thus sought to fill these knowledge gaps by investigating the effects of bank capitalization on intermediation efficiency of all commercial banks in Kenya.

This study further makes a useful contribution by using a rich panel dataset of 39 banks for a sufficiently long period 2014-2023, with the period informed by the numerous policy reforms that have been implemented in the banking sector. The relatively long data period further enriched the estimation and analysis of efficiency over time, offering a more robust basis for assessing the impact of various policy interventions. Moreover, while most studies on bank intermediation efficiency rely solely on secondary data, the current study incorporated both primary and secondary data. This mixed-methods approach provided deeper insights and wider perspective of how bank specific attributes influence intermediation efficiency of commercial banks in Kenya.

Study Hypothesis

The study tested the following null hypothesis:

H_0: Bank capitalization has no statistically significant effect on intermediation efficiency of commercial banks in Kenya

Literature Review

Theoretical Review

This study was anchored on the economic efficiency theory of the firm which is grounded on an assumption that the business entity operates in a perfectly competitive market and uses its assets, experience and capital to generate profits and efficiency (Cohen & Cyert, 1975). In this competitive market, it is natural to expect that all the actions of the firm are geared towards maximizing profits through both revenue maximization and cost minimization. The theory posits that in a competitive market environment, the firm which fails to reach the efficient frontier will be driven out of the market and the efficient one will survive (Dong, 2009). This theory was applied in this study to link bank capitalization to intermediation efficiency of commercial banks. Commercial banks ensure that they are well capitalized to reduce the long-

term risks and because their liabilities are well backed by assets and capital, banks have an edge over other competitors (Qayyum, 2018). By exposing the bank to a higher risk of insolvency, the rather high degree of debt in a bank's capital structure helps to discipline managers' risk-taking and their vigilance in supplying financial services. Given that the loan is demandable and not entirely covered, growing liquidity risk raises safety issues and performance pressure even more. These incentives usually help banks keep good eye on their capital adequacy (Jelassi & Delhoumi, 2021). Therefore, having adequate capital can enhance the financial performance of bank and boost credit availability for companies too informationally opaque to borrow in public debt and equity markets. Besides, commercial banks seek to adhere to prudential regulations by the government regulators and this pressure makes management to have adequate capital and enhance their efficiency to meet the legal requirements (Istaiteyeh et al., 2024).

Empirical Review

Financial intermediation efficiency is crucial for commercial banks as it helps in identifying the best mix of resources needed to achieve a certain level of production. The financial sector's efficiency contributes to the stability of the financial system and economic progress by eliminating inefficiencies (Rathore, 2021). A study by Dao and Nguyen (2020) examined the factors that affect both the efficiency of banks and their capital adequacy ratio as well as the correlation between the two. The study used of 128 observations made from 16 Vietnamese commercial banks between 2010 and 2017 and included capital adequacy ratio, provision for loan loss ratio and cost to income ratio as study variables. The findings show a statistically significant association between capital adequacy ratio and bank efficiency, as well as significant relationships between cost-to-income ratio and capital adequacy ratio. The study's results show that in order to maintain a sufficient level of efficiency, commercial banks should attain the requisite capital adequacy ratios.

Odekina et al. (2019) examined the performance of commercial banks in Nigeria in relation to capital adequacy and operational efficiency. The annual bank reports served as the study's primary sources of secondary panel data. Panel random effect regression was the method of data analysis used. The study's capital adequacy variables demonstrate that capital adequacy significantly improves the operational efficiency of the bank. Thus, having enough capital stimulates, enhances, and grows the operational efficiency of commercial banks, and that having enough capital and good management may lead to better performance. Another study by Lotto (2018) investigated the effects of capital requirements regulation on bank operating efficiency in Tanzania during the period 2009 -2015. The study found that capital ratio has a positive and significant relationship with bank operating efficiency, implying that banks with more stringent capital regulations are more operationally efficient. A number of conclusions were drawn from these results. First, capital adequacy strengthens financial stability by the sheer size of capital made available and also enhances bank operating efficiency through prevention of a moral hazard problem between debt holders and shareholders. Secondly, increased rules on capital requirements have an impact on decision making within the bank as it influences the bank’s decision to revisit their internal operations strategy in terms of credit evaluation procedures, corporate governance, human resource matters, risk assessment methods and enhanced internal control procedures.

Adusei (2016) applied binary logit in assessing the drivers of the technical efficiency in rural and community banks in Ghana. The study showed that capitalization had negative and significant effect on technical efficiency when fund quality is not included in the logit model. Capitalization on the contrary has negative and significant effect when fund quality but bank

size is not included in the logit model. Another study by Řepková (2015) applied the ordinary least square method to examine the efficiency drivers in the Czech banking sector over the period 2001–2012. The results revealed that the level of bank capitalization was one of variables that had positive and significant effect on banks efficiency. The results were similar to the findings by Singh and Fida (2015) who applied Tobit model to estimate the determinants of the technical efficiency of Oman banking sector. It was found that capital adequacy had positive and significant effect on technical efficiency.

Nasieku (2014) examined the impact of Basel capital adequacy framework on the economic efficiency of commercial banks in Kenya between 2001 and 2011. DEA was utilized to analyze banks economic efficiency and Malmquist index to measure growth of banks in Kenya during 2001-2011 period of analysis. The study revealed that efficiency in the Kenyan banking sector is influenced by the level of capital held by the bank and the country's economic situation. The study also found out that risk-based capital cushions impact on bank efficiency positively unlike voluntary capital cushions measured by the leverage ratio. Alrafadi et al. (2014) examined the determinants of the efficiency of Libyan Banks over the period 2004–2010 using Tobit model. The results indicate the existence of positive and significant effect between capital adequacy and efficiency on overall technical efficiency. It also showed that capital adequacy and efficiency have positive and significant effect on pure technical efficiency.

Conceptual Framework

The study's conceptual framework is provided in Figure 1 and provides the hypothesized relationship between bank capitalization and intermediation efficiency. Bank capitalization was measured using capital adequacy which was proxied by the ratio of equity to total risk weighted assets to indicate the bank safety and soundness. Intermediation efficiency was measured using DEA as a ratio of the weighted sum of outputs to the weighted sum of inputs. The inputs used were wages, fixed assets and deposits, while the outputs were loans and investments.

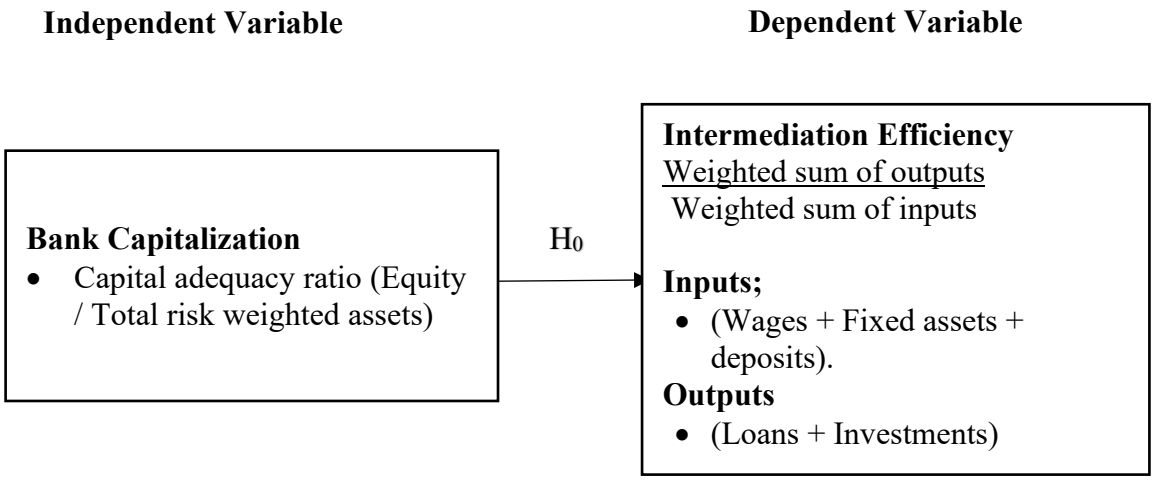

Figure 1: Conceptual Framework

Methodology

This research used a positivist philosophy to collect data on bank capitalization and assess its influence on intermediation efficiency of commercial banks in Kenya. This study used an

explanatory sequential research design, which according to Creswell and Creswell (2022), is a mixed methods research design that follows a two-phase approach. The design begins with the collection and analysis of quantitative data, followed by the collection and analysis of qualitative data (Kothari & Garg, 2019). The qualitative data is gathered after design of an instrument that is informed by the findings of the quantitative analysis (Schindler, 2022). This study applied this design by first gathering secondary data from the 34 commercial banks in Kenya for ten years from 2014 to 2023 and analyzing it to get quantitative findings. Thereafter, the study then used interviews to gather qualitative data based on the findings from the secondary quantitative data analysis.

A two-stage analysis was then adopted where in the first stage; efficiency scores were generated using the DEA methodology. The estimated efficiency scores were used as dependent variables in the efficiency equation. The frontier efficiency analysis in R (FEAR) program was utilized to computed efficiency scores using DEA. In the second stage, Tobit panel regression analysis was used to regress DEA efficiency scores against bank capitalization. The study conducted diagnostic tests to evaluate the six essential assumptions; linear relationship between outcome and predictor variables, no multicollinearity, stationarity, no autocorrelation, normality of regression residuals, and homoscedasticity. This study used Nvivo software and applied the six steps to analyze the qualitative data. The steps include familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining themes, and generating the report (Creswell & Creswell, 2022), The results from the analysis were used to explain the findings from the quantitative secondary data analysis.

Results

General Information

The study gathered secondary data for bank capitalization and financial performance from 39 commercial banks in Kenya for a period of 10 years (2014 – 2023). Of the 39 commercial banks that were considered in the study, 34 satisfied the inclusion criteria as they were operational for 10 years and this resulted in 340 observations.

Descriptive Analysis of Bank Capitalization and Intermediation Efficiency

The study measured capitalization as the ratio of core capital to total risk weighted assets of the commercial banks. The panel data descriptive statistics for capitalization were computed and the findings are displayed on Table 1. The descriptive information for capitalization for the 34 commercial banks for 2014 – 2023 comprises of mean, standard deviations, minimums, and maximums.

Table 1: Descriptive Statistics for Capitalization

Variable		Mean	Std. Dev.	Min	Max	Obs.
Capitalization	Overall	17.9	7.43	-4.52	58.2	N = 340
	Between		5.32	2.75	45.3	n = 34
	Within		2.27	16.6	19.5	T = 10

The panel data findings on capitalization, measured as core capital divided by risk-weighted assets, reveal that commercial banks in Kenya maintain a relatively strong capital position. The overall mean capitalization stands at 17.9%, which suggests that, on average, banks are operating well above the statutory minimum capital adequacy ratio set by regulators of 10.5%. This indicates a generally sound financial system with banks possessing sufficient buffers to absorb potential losses and maintain stability in the face of economic shocks.

The decomposition of the standard deviation into between-bank and within-bank variations provides further insight into capitalization dynamics. The between standard deviation of 5.32% shows that there are notable differences in capitalization levels across the 34 banks in the study, reflecting institutional disparities such as varying risk appetites, business models, or management strategies. In contrast, the within standard deviation of 2.27% indicates that capitalization levels for individual banks tend to remain relatively stable over time. This consistency suggests that banks follow steady capital management practices, with few drastic year-to-year shifts.

However, the data also highlight potential outliers, as evidenced by the minimum capitalization value of -4.52%, which points to at least one instance of severe undercapitalization or financial distress. On the other end of the spectrum, some banks reported capitalization as high as 58.2%, indicating a highly conservative approach or limited risk exposure. These extremes underscore the need for continuous regulatory oversight to ensure that undercapitalized institutions do not threaten financial system stability, while also examining whether excessively capitalized banks are underutilizing resources that could support economic growth.

The study used Frontier Efficiency Analysis with R (FEAR) package to perform non-parametric efficiency analysis utilizing data envelopment analysis (DEA). Using FEAR for DEA-based non-parametric efficiency analysis is methodologically sound and practically efficient. The FEAR package was instrumental in evaluating intermediation efficiency by analysing inputs (wages, fixed assets and deposits) and outputs (loans and investments). Table 2 includes descriptive information for intermediation efficiency across the 34 commercial banks over the period 2014 – 2023, including the means, standard deviations, minimums, and maximums.

Table 2: Descriptive Statistics for Intermediation Efficiency

Variable		Mean	Std. Dev.	Min	Max	Obs.
Intermediation Efficiency	Overall	0.771	0.238	0.531	0.951	N = 340
	Between		0.229	0.574	0.893	n = 34
	Within		0.192	0.622	0.835	T = 10

The descriptive statistics for intermediation efficiency among commercial banks in Kenya, as shown in the panel data descriptive analysis in Table 2, reveal a relatively high average efficiency level of 0.771 or 77.1% across the 10-year period. The overall standard deviation of 0.238 indicates moderate variability in efficiency levels across the observed banks. The minimum and maximum values of 0.531 and 0.951 respectively suggest that while some banks operate with notably lower efficiency, others approach near-optimal intermediation. The dataset includes 340 observations, covering 34 commercial banks over a 10-year period, offering a robust basis for analysing trends and performance in the sector.

Further, the "between" variation, which reflects differences across banks, shows a standard deviation of 0.229, with intermediation efficiency ranging from 0.574 to 0.893. This points to notable efficiency disparities between different banks. On the other hand, the "within" variation, capturing changes over time within each bank, has a slightly lower standard deviation of 0.192 and a narrower efficiency range from 0.622 to 0.835. This indicates that while banks do experience changes in efficiency over time, these shifts are less pronounced than the differences observed between institutions. Overall, the statistics suggest that structural and institutional factors may play a larger role than temporal ones in shaping intermediation efficiency.

Tobit Fixed Effects Model

The objective of the study was to evaluate the effect of bank capitalization on intermediation efficiency of commercial banks in Kenya. The study fitted a Tobit regression model which was used to address the objective and also to test the study hypothesis which stated;

H_0: Bank capitalization has no statistically significant effect on intermediation efficiency of commercial banks in Kenya.

The study findings of the fitted fixed effects model are provided in Table 3.

Table 3: Tobit Model of Bank Capitalization on Intermediation Efficiency

Tobit fixed-effects regression					Number of obs =	306
					Uncensored =	306
Limits	Lower = 0				Left-censored =	0
	Upper = 1				Right-censored =	0
					Wald chi2(1) =	59.89
Log likelihood = -131.40957					Prob > chi2 =	0.000

EFF	**Coef.**	**Std. Err.**	**z**	**P > | z |**	**[95% conf. interval]**	
Bank Capitalization	.2215	.0817	2.71	0.007	.0613	.2917
_Cons	-.1842	.1298	-1.42	0.156	-.3512	.0918
var (e.EFF)	2.7098	.2554			2.2526	3.2597

The resultant equation from the Tobit regression model is;
$EFF_{it} = -0.1842 + 0.2215$ Bank $\text{Capitalization}_{it} + \varepsilon_{it}$
Where:

EFF = Intermediation efficiency
i = Bank
t = Year
ε = error term

Table 3 presents Tobit regression findings that examine the influence of bank capitalisation, measured as core capital relative to risk-weighted assets, on intermediation efficiency among commercial banks in Kenya, considering efficiency scores constrained between 0 and 1. The model is based on 306 observations, all uncensored, indicating that none of the efficiency scores hit the model's limits. The significant Wald chi-square statistic ($\chi^2 = 59.89$, $p < 0.001$) suggests that the overall model is statistically significant, meaning that bank capitalization explains a significant portion of the variation in intermediation efficiency. The coefficient for bank capitalization is 0.2215 with a standard error of 0.0817, yielding a z-value of 2.71 and a p-value of 0.007. This result is statistically significant at the 1% level, implying a positive relationship between bank capitalization and intermediation efficiency. Specifically, an increase in the capitalization ratio is associated with an increase in efficiency. The 95% confidence interval for the coefficient ranges from 0.0613 to 0.2917, confirming that the effect is robust and not likely due to random chance.

The constant term (_Cons) has a coefficient of -0.1842 and is not statistically significant ($p = 0.156$). This suggests that when bank capitalization is zero, the predicted intermediation efficiency is negative, which is not meaningful within the bounded 0 to 1 range of efficiency. However, since this value is not statistically different from zero, it does not significantly affect the interpretation of the main effect of bank capitalization. Further findings show that the variance of the error term (var(e.EFF)) is estimated at 2.7098 with a confidence interval between 2.2526 and 3.2597. This indicates considerable unexplained variability in intermediation efficiency that is not captured by bank capitalization alone. While capitalization plays a significant role, other factors likely contribute to the efficiency outcomes observed in the banking sector. The findings indicate that banks with higher capital levels are generally more effective in their intermediation functions, hence reinforcing regulatory initiatives aimed at sustaining sufficient capital in the industry. These findings led to the rejection of the null

hypothesis that bank capitalization has no statistically significant effect on intermediation efficiency of commercial banks in Kenya.

Findings from the interviews showed consensus that bank capitalization, measured by the ratio of core capital (Tier 1 capital) to total risk-weighted assets (RWAs), plays a crucial role in shaping the bank's intermediation efficiency. Study participants indicated that when a bank maintains a strong capital adequacy ratio, it signals financial soundness and stability. This enhances stakeholder confidence, particularly that of depositors and investors, allowing the bank to attract more funds at lower costs. One study participant posited that 'A well-capitalized bank also has greater capacity to absorb losses, reducing the probability of insolvency. This financial buffer allows the bank to engage more confidently in lending activities, potentially increasing the volume and quality of credit extended to the economy.'

Further, findings from the interviews determined that a well-capitalized bank has more flexibility in managing credit risk and can lend more confidently across various sectors of the economy. One research participant explained this and noted that 'this promotes a more active and efficient intermediation process, as the bank can meet the credit demands of businesses and consumers without being overly constrained by regulatory capital requirements or market pressures.' Study participants also observed that capital adequacy allows banks to withstand economic shocks and maintain their lending activity even during times of financial stress. Respondents observed that this countercyclical effect helps stabilize the broader economy and ensure that credit continues to flow to where it is most needed, thus improving the overall efficiency of financial intermediation of the commercial banks. However, a few study participants observed that the relationship between capital adequacy and intermediation efficiency may not strictly be linear. One study participant noted that 'holding excessive capital can be costly, as it may indicate under-leveraging or inefficient capital allocation. Since equity capital is more expensive than debt, an overly conservative capital buffer might reduce the bank's return on equity and lead to conservative lending policies that dampen credit expansion, ultimately impairing intermediation efficiency.'

Generally, study participants were of the view that a bank with low capital adequacy may pursue aggressive lending strategies to boost short-term profitability, but this can come at the cost of higher credit risk and potential instability. Thus, inadequate capital buffers can constrain lending during economic downturns, when capital conservation becomes a regulatory priority, thus reducing the bank's ability to fulfil its intermediation role. Therefore, the implication of the interview findings is that a high capital adequacy ratio enhances a bank's intermediation efficiency by ensuring financial stability and maintaining credit supply, but both excessive and insufficient capital can undermine this efficiency. Therefore, optimal capital adequacy is essential for sustaining a bank's effective financial intermediation.

Discussion

The study sought to evaluate the effect of bank capitalization on intermediation efficiency of commercial banks in Kenya. The findings revealed that bank capitalization has a statistically significant and positive impact on the intermediation efficiency of commercial banks in Kenya. These findings strongly support the economic efficiency theory. According to Diamond and Rajan (2000), sufficient capitalization enables financial institutions to perform their intermediary roles effectively, mobilizing savings, allocating credit, managing risks, and reducing transaction costs, functions that are central to a well-functioning banking sector. Capital adequacy ensures that banks maintain liquidity and stability, thereby fostering depositor confidence. Furthermore, as Marcus (1984) and subsequent scholars like Milne and

Whalley (2001) have argued, banks maintain buffer capital not only to meet regulatory requirements but also to shield themselves from supervisory penalties and exploit future growth opportunities, especially when loan demand surges. This buffer also serves as a signal of strength and credibility to external stakeholders, including credit rating agencies. Therefore, the positive relationship observed in the study aligns with the theoretical and empirical literature, underscoring the strategic importance of robust capitalization in enhancing banks' ability to intermediate efficiently in the financial system.

The findings that bank capitalization has a statistically significant and positive effect on the intermediation efficiency of commercial banks in Kenya are consistent with much of the existing literature that emphasizes the crucial role of capital adequacy in enhancing bank efficiency. According to Dao and Nguyen (2020), achieving the required capital adequacy ratios is essential for maintaining operational efficiency in commercial banks. Similarly, Odekina et al. (2019) argue that sufficient capital not only improves bank operations but also supports growth and overall performance. Lotto (2018) adds that adequate capitalization promotes financial stability and operational efficiency by mitigating moral hazard risks between shareholders and debt holders. These perspectives align with the positive relationship observed in the findings, where well-capitalized banks demonstrate higher efficiency in financial intermediation. While some studies, such as Adusei (2016), have found a negative effect of capitalization on efficiency, often attributing it to the cost implications of raising capital, the prevailing consensus leans toward a positive influence. Therefore, the current findings substantiate the view that capital adequacy is not just a regulatory requirement but a strategic enabler of intermediation efficiency and stability in the banking sector.

The Tobit regression findings, which indicated a significant positive relationship between bank capitalization and intermediation efficiency collaborate existing literature that emphasizes the critical role of capital adequacy in enhancing financial intermediation efficiency within the banking sector. Rathore (2021) underscores the importance of financial intermediation efficiency in driving organizational success and economic stability by eliminating inefficiencies. This is echoed in Omete's (2023) study, which found a strong and favorable relationship between capital adequacy and financial efficiency, ultimately contributing to better bank performance in Kenya. Similarly, Dao and Nguyen (2020) established that capital adequacy ratios are significantly associated with bank efficiency, suggesting that sufficient capitalization is a prerequisite for maintaining operational efficiency. In the Nigerian context, Odekina et al. (2019) also concluded that adequate capitalization directly improves the operational efficiency of commercial banks, reinforcing the notion that capital buffers enhance a bank's ability to perform effectively.

The interview insights, which highlighted that strong capital adequacy enhances financial soundness, stakeholder confidence, credit risk management, and resilience during economic shocks, ultimately contributing to more effective financial intermediation, are well supported by existing empirical literature. Several studies affirm the positive link between capital adequacy and banking efficiency. For instance, Řepková (2015) found that bank capitalization significantly improved efficiency in the Czech banking sector, a finding echoed by Singh and Fida (2015) in the context of Oman, where capital adequacy was positively associated with technical efficiency. Similarly, Alrafadi et al. (2014) observed a significant positive relationship between capital adequacy and both overall and pure technical efficiency in Libyan banks. Nasieku (2014) further supports this view, noting that risk-based capital cushions, those aligned with regulatory frameworks such as Basel, positively influence intermediation efficiency in Kenyan banks. These studies collectively validate the qualitative insights from

interviews, which emphasized that well-capitalized banks are more robust, inspire greater trust among stakeholders, manage credit risk more effectively, and are better equipped to absorb economic shocks. However, it is important to acknowledge divergent findings such as those by Adusei (2016), whose study of rural and community banks in Ghana revealed a negative relationship between capitalization and intermediating efficiency under specific model conditions. Despite this outlier, the broader literature consistently supports the notion that adequate capitalization is a critical pillar of bank efficiency and effective intermediation.

Conclusion

The study concluded that bank capitalization plays a critical role in enhancing the intermediation efficiency of commercial banks in Kenya. Empirical evidence confirms a statistically significant and positive relationship between capitalization and efficiency, underscoring the value of strong capital buffers in promoting sound financial practices, resilience, and effective credit allocation. Further, the study concludes that well-capitalized banks are better equipped to manage risks, meet stakeholder expectations and be more effective in intermediation, while also revealing disparities in capitalization levels across institutions that call for sustained regulatory oversight. Overall, the results highlight capitalization as a key lever for improving banking sector performance and ensuring efficiency in financial intermediation.

Recommendations

Based on the conclusions, it is recommended that banks should aim to maintain capital ratios well above regulatory minimums while avoiding excessive capitalization that may signal underutilized lending capacity. Furthermore, management should implement consistent capital planning strategies and support regulatory oversight to address undercapitalization risks and ensure capital is optimally aligned with each bank's risk profile and growth objectives. The study also recommends to regulatory authorities in Kenya to continue to enforce and possibly enhance capital adequacy requirements for commercial banks to sustain and improve intermediation efficiency. However, given the presence of both undercapitalized and excessively overcapitalized institutions, regulators should intensify risk-based supervision to ensure that undercapitalized banks are promptly addressed to prevent systemic risks, while encouraging overcapitalized banks to optimize capital use in ways that stimulate economic activity without compromising prudential standards.

References

Abdulahi, S. M., Yitayaw, M. K., Feyisa, H. L., & Mamo, W. B. (2023). Factor affecting technical efficiency of the banking sector: Evidence from Ethiopia. *Cogent Economics and Finance, 11*(1), 2186039. Doi:10.1080/23322039.2023.2186039

Adusei, M. (2016). Determinants of bank technical efficiency: Evidence from rural and community banks in Ghana. *Cogent Business & Management, 3*(1), 1 – 15. Doi:10.1080/23311975.2016.1199519

Alrafadi, K. M., Kamaruddin, B. H., & Yusuf, M. (2014). Efficiency and determinants in Libyan banking. *International Journal of Business and Social Science, 5*, 156–168.

Andries, A. M. (2011). The determinants of bank efficiency and productivity growth in the central and eastern European banking systems. *Eastern European Economics, 49*(6), 38-59.

Arora, P. (2014). Reforms, Ownership and Determinants of Efficiency: An Empirical Study of Commercial Banks in India. *Journal of Emerging Market Finance, 13*(1), 103–138. 132

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money, 18*(2), 121–136.

Camanho, A. S., Silva, M. C., Piran, F. S., & Lacerda, D. P. (2024). A literature review of economic efficiency assessments using Data Envelopment Analysis. *European Journal of Operational Research*, *315*, 1–18. Doi:10.1016/j.ejor.2023.07.027

Cetorelli, N., Mandel, B. H., & Mollineaux, L. (2012). The Evolution of Banks and Financial Intermediation: Framing the Analysis. *Federal Reserve Bank of New York Economic Policy Review, 18*(2), 1-12.

Chowdhury, M. A. I., Uddin, M. S., Ahmmed, M., Hassan, M. R., & Kabir, M. J. (2023). Potential risks of liquidity and credit affecting the efficiency of Islamic banks in Bangladesh. *Cogent Economics and Finance*, *11*(1), 2209950. Doi:10.1080/23322039.2023.2209950

Cohen, K. J. and Cyert, R. M. (ed.) (1975). Theory of the Firm: Resource Allocation in the Market Economy, Prentice Hall, New Jersey.

Creswell, J. W., & Creswell, D. (2022). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (6th ed.). New York: SAGE Publications.

Dao, B. T. T., & Nguyen, K. A. (2020). Bank Capital Adequacy Ratio and Bank Performance in Vietnam: A Simultaneous Equations Framework. *The Journal of Asian Finance, Economics and Business*, *7*(6), 39–46. Doi: 10.13106/JAFEB.2020.VOL7.NO6.039

Diamond, D. W., & Rajan, R. G. (2000). *A theory of bank capital.* Journal of Finance, 55, 2431-2465.

Dong, Y. (2009). *Cost efficiency in the Chinese banking sector: a comparison of parametric and non-parametric methodologies.* Unpublished Doctoral Thesis, Loughborough University.

Grmanová, E., & Ivanová, E. (2018). Efficiency of banks in Slovakia: Measuring by DEA models. *Journal of International Studies*, *11*(1), 257–272. Doi: 10.14254/2071

Istaiteyeh, R., Milhem, M. M., & Elsayed, A. (2024). Efficiency Assessment and Determinants of Performance: A Study of Jordan's Banks Using DEA and Tobit Regression. *Economies*, *12*(2), 37. Doi:10.3390/economies12020037

Jelassi, M. M., & Delhoumi, E. (2021). What explains the technical efficiency of banks in Tunisia? Evidence from a two-stage data envelopment analysis. *Financial Innovation*, *7*(1), 1–26. Doi: 10.1186/s40854-021-00282-w

Kiemo, S., & Kamau, A. (2020). *Banking sector competition and intermediation efficiency in Kenya*. Nairobi. Kenya Bankers Association.

Kothari, C. R., & Garg, G. (2019). *Research Methodology* (4th ed.). New Delhi: New Age International Publishers.

Lotto, J. (2018). The empirical analysis of the impact of bank capital regulations on operating efficiency. *International Journal of Financial Studies, 6,* 34-43.

Marcus, A. (1984). Deregulation and Bank Financial Policy. *Journal of Banking and Finance, 8,* 557–565.

Milne, A., and Whalley A.E. (2001). Bank Capital Regulation and Incentives for Risk -Taking. *Journal of Banking & Finance, 20*(3), 495-509.

Nasieku, T. (2014). *Basel Capital Adequacy Framework and Economic Efficiency of Commercial Banks in Kenya.* Unpublished PhD Thesis: Jomo Kenyatta University of Agriculture and Technology.

Odekina, I. I., Gabriel, A. O., & Solomon, T. T. (2019). Effect of Capital Adequacy, Credit Risk and Operating Efficiency on the performance of Commercial Banks in Nigeria. *Financial Markets, Institutions and Risks*, *3*(1), 106–114. Doi:10.2139/ssrn.2536531

Omete, F. I. (2023). *Financial intermediation efficiency and performance of commercial banks listed on the Nairobi Securities Exchange in Kenya* [Unpublished PhD Thesis, Kenyatta University].

Osoro, J., & Kiplangat, J. (2020). *Market Power and Intermediation Efficiency in Kenya: Blind Spots and Empirical Clarity*. Nairobi: Kenya Bankers Association.

Qayyum, A. (2018). *Measurement of Banks Efficiency in Emerging Economies* [Unpublished PhD Thesis]. COMSATS University Islamabad.

Rathore, A. S. (2021). *Essays on the risk and efficiency of the banks* (Unpublished PhD Thesis). University of Glasgow, Glasgow.

Repkova, I. (2015). Banking efficiency determinants in the Czech banking sector. Procedia Economics and Finance, 23, 191–196.

Schindler, P. S. (2022). *Business Research Methods* (14th ed.). McGraw-Hill Education.

Silva, A. F. (2018). *Essays on financial intermediation* [Unpublished Doctoral Thesis]. University of London.

Singh, D., & Fida, A. B. (2015). Technical efficiency and its determinants: An empirical study on banking sector of Oman. Problems and Perspectives in Management, 13, 168–175.

Ullah, S., Majeed, A., & Popp, J. (2023). Determinants of bank's efficiency in an emerging economy: A data envelopment analysis approach. *PLoS ONE*, *18*(3), e0281663. Doi: 10.1371/journal.pone.0281663

Ulvi, Y. (2023). Measuring the efficiency of the banking sector by the method of Data Envelopment Analysis. *Proceedings of the 5th International Scientific and Practical Conference*, *30(143)*, 70–79. Doi:10.51582/interconf.19-20.02.2023.008

Werner, R. A. (2015). Lost century in economics: three theories of banking and the conclusive evidence. International Review of Financial Analysis, 1-19. doi:10.1016/j.irfa.2015.08.014.

Yahaya, O. A., & Awen, B. I. (2020). Bank-specific attributes and operational efficiency: Evidence from efficient-structure hypothesis. *Journal of Business and Social Review in Emerging Economies*, *6*(3), 1087–1098. Doi:10.26710/jbsee.v6i3