

Effect of Deposits Portfolio on the Financial Performance of Commercial Banks in Kenya

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Abstract: Managing a bank's portfolio effectively, maximizing returns and minimizing risks all at once, while being constrained by management and regulatory requirements, is no easy feat. While concentrating on the removal of current risk classes, this article addresses relevant topics in the banking industry's portfolio diversification. Focusing on commercial banks in Kenya, this study evaluates the theoretical and empirical foundations of portfolio diversification as a strategy for banks operating in a nation like Kenya. This research set out to address the limitations that Kenyan banks face by building a multi-objective strategy for achieving an optimum balance sheet, using the present situation as a starting point. The purpose of the research was to find out how different types of deposit portfolios affected the bottom lines of Kenyan commercial banks. Research methods that were used in the study were descriptive and correlational. The study's intended participants were the 43 commercial banks that have obtained formal licenses from the Central Bank of Kenya by the end of 2018. Data for the study came from a variety of sources, including the Kenya National Bureau of Statistics, the World Bank, the Central Bank of Kenya, the published financial accounts statements of all 43 commercial banks in Kenya, and the Banking survey publications. The data was analyzed using time series and cross-sectional unbalanced secondary panel methods. The study covered the years 2003–2018. Existing pair-wise correlations between the studied variables were examined in the study. Financial performance was positively impacted by the diversification of deposits. According to the research, portfolio management should have safeguards in place to reduce risk. Commercial banks should prioritize building trust, creating diverse marketing tactics, and determining the optimal asset combination for efficient portfolio diversification.

Keywords: Deposits Portfolio, Financial Performance, Commercial Banks, Banks' Portfolio Diversification.

I. INTRODUCTION

Commercial banks, like other profit-making institutions, are expected to generate profitable revenues by efficiently and effectively utilizing their capital resources to ensure progress and meet the shareholders' expectations of maximum returns on their investments. Financial intermediation, which is a primary function of commercial banks, involves receiving money from entities having excess funds in the form of different types of deposit accounts, and then lending these monies to entities who need them at different interest rates. Moudud-Ul-Huq, Zheng, Gupta, Hossain, and Biswas (2023). In order to fulfill their primary role of intermediation, banks should be in sync with the economic and social progress of a country. In this current age of economic problems and changes, banks are experiencing a period of significant turmoil. It is essential to implement methods to aid in the recovery of the banking sector. Olarewaju, Migiro, and Sibanda (2017) and Maharjan and Pradhan (2023) argue that it is crucial to enhance the portfolio composition of banks.

The banking system plays a crucial role in the development and rapid growth of a country's economy. It facilitates the efficient allocation of resources by using deposited surpluses to provide funding to sectors of the economy that are experiencing a deficit. This promotes liquidity and ensures the proper functioning of a country's financial systems. The financial sector, which includes both banking and non-banking firms, has a role in determining the sorts of assets that the

public may choose to hold, as well as the types of obligations that debtors are ready to take on. Consequently, it will undergo changes in size, maturity, and risk level for different types of assets, thereby increasing the opportunities for savers who want to purchase long-term assets. Retail banks primarily acquire short-term deposits, but they may effectively simulate long-term deposits by maintaining a steady influx of deposits from customers. The primary and essential function of banks is to facilitate the allocation of resources, particularly in developing countries like Kenya, where the available resources may not be sufficient to meet the economic and developmental requirements (Cavaliere, Keswani, Kumar, Mathew, Das, Hasan, and Regin, 2021). An essential task is to analyze the input-output mix portfolio of these banks and their interactions with each other in order to assess the overall performance of banking institutions in Kenya.

Various researchers have identified factors that can influence bank performance, with one of them being diversification. However, Ngware, Muturi, and Olweny (2019) and Olweny and Shiphoo (2011) have found that there is no agreement on how diversification of income streams has specifically contributed to cost efficiency and improved performance in this specific region. Kiweu (2012) and Mulwa (2018) argue that there is an urgent need to examine the diversification of revenue streams in the Sub-Saharan Africa (SSA) area. They are driven by curiosity to uncover the impact of income diversification on bank performance after the 2008 crisis. The efficient operation of retail banking institutions, which stimulate the development of the capital market, is the fundamental basis for the production of capital. The Kenyan financial system is regarded as the highest-ranking system among those in sub-Saharan Africa (Ngware, Muturi, & Olweny, 2019; Odhiambo, 2008). Commercial banking organizations have seen growth and recorded higher levels of assets. The banking system in Kenya comprises of 43 commercial banking institutions and 2 mortgage finance businesses. Commercial banks are categorized into three groups based on their asset base. The success of a bank is closely linked to the way in which bank management gather, distribute, and handle the inherent risks of resources. It might also be seen in relation to the quality of the assets portfolio, the degree of liquidity, and the net contribution to a nation's economic progress.

The banking industry in Kenya has received praise for its variety and scale when compared to other economies in East Africa. There is a noticeable shift in portfolio allocation towards assets that are seen to be less hazardous, such as cash and government securities. In September 2016, the proportion of Government securities to the sector's balance sheet was 24%, which is higher than the average of roughly 18% from 2011 to 2015. In 2015, the private credit to GDP ratio, which is a commonly used measure of financial development, was projected to be 34.9%. This is lower than the average of 45% for nations in Sub-Saharan Africa. (CBK, 2016).

If banks do not properly manage their portfolio of deposit types and sectoral loans, it will be difficult to achieve the required performance. Portfolio refers to a combination of deposits with different time structures and associated expenses, while the portfolio mix of sectoral credits is assigned based on time structures and the interest rates used for lending. The composition of these portfolios might result in hazards for banks, which in turn can impact their performance. A portfolio is often associated with diversification as it describes the methods used to control unsystematic risk variables that are inherent in the activities conducted by banks (Kipleting & Bakongo, 2016). The evaluation found that diversifying income-generating activities, both in terms of interest and non-interest streams, increases profitability by reducing the risk of bankruptcy.

Banking across borders increases income stream diversification due to competition, according to research by Sissy (2015) that included 329 banks in 29 African nations from 2002 to 2013. This understanding provides support for the idea that diversifying a bank's income streams and geographic reach improves the quality and consistency of that performance. According to Kiweu (2012), commercial banks' income performance as a result of their loan portfolios should be examined in light of the various deposit classes and the capital base. This is particularly true in Kenya. The reasoning behind this is that successful outcomes are more likely to occur when deposit and credit portfolios are well-aligned. The capital basis, the bank's deposit and credit portfolio, and the performance of the bank as a whole are all factors that are likely to be interrelated.

Research conducted in Kenya, including studies by Maharjan and Pradhan (2023), Mulwa and Kosgei (2016), Oloo (2011), Kiweu (2012), and others (Mulwa (2013), Magambo (2013), Wafula (2014), Mutega (2016), Sanya and Wolfe (2011), Teimet, Ochieng and Anywa (2011), and Kipleting and Bokongo (2016), has reached a consensus regarding the centrality of managing a retail bank's portfolio and diversifying its products and services in order to mitigate unsystematic risks, maximize shareholder wealth, and ensure the survival of the business in the face of intense industry competition. There have been significant changes in the number of institutions, ownership structure, scope and depth of activities, and overall state of Kenya's banking sector throughout the years. Challenges posed by financial sector deregulation, globalization of banking operations, technological innovation, and the adoption of supervisory and prudential regulations that bring institutions into line with international standards have all contributed to these shifts.

Statement of the Problem

Despite significant financial sector reforms in Africa in the 1980s and 1990s, commercial banks have continued to perform poorly in their overall role of financial intermediation. This is due to several factors, including increased credit risk from non-performing loans, inadequate capitalization, poor asset quality, operational inefficiencies, high costs, and low liquidity. It has come to light that several Kenyan banks are still reporting losses (CBK, 2019). Earnings per share growth for Kenyan commercial banks was dismal in 2018 (8.6%), 2016 (4.4%), and 2015 (2.8%), compared to a five-year average of 13.9%. Over the whole industry, ROA averaged 3.7 in 2010, 2.96 in 2014, and 2.70 in 2018. Since its 2008 high of 26.5%, return on equity has fallen to 24.4 in 2017 and 20.8 in 2018. (CBK, 2019). The industry's fundamental problems, such as provisioning for non-performing loans, slowing growth in private sector lending, difficulties with deposits, and liquidity, are to blame for this dismal performance. The total loans and advances made by Kenyan banks increased by 8.1% to Kshs 1.9 trillion in FY'2016 from Kshs 1.8 trillion in FY'2015, a moderate pace compared to the 14.6% growth recorded during the last five years. From Kshs 2.0 trillion in FY 2015 to Kshs 2.1 trillion in FY 2016, the growth rate of deposits was 6.7%, which is lower than the 5-year average growth rate of 14.6%. Danger is a problem for 95% of financial firms. Kenyan banks have spread their bets over a variety of assets and revenue sources (Berger et al., 2010). Results from individual banks don't tell the whole story when it comes to the economy as a whole.

Banks' portfolio diversity and its impact on financial performance has been the subject of fragmented and incomplete examination in a number of studies, both domestic and foreign. Some examples of such studies on credit diversification include Maharjan and Pradhan (2023), Mulwa (2018), Meressa (2017), and Yudistira and Anggono (2013). Research on deposit diversification was conducted by Lomuto (2008). Kiweu (2012) and Teimet, Ochieng and Anywa (2011) found that diversifying income is beneficial. When it comes to investing, Rop et al. (2016) looked at diversity. Because of these limitations and contradictory findings, the studies provide room for further research. For example, in emerging institutional settings like Kenya's, researchers have shown that portfolio diversity helps improve financial performance (Mulwa, Tarus and Kosgei, 2015; Mulwa and Kosgei, 2016; Mwau et. al., 2015). In their 2004 study, Gönenç and Kılıçhan found the inverse correlation between diversity and return on asset. It is acknowledged by Patrick (2012) that there is no universal agreement about whether portfolio diversity has a positive, negative, or neutral effect on financial performance. According to Doaei, Anuar, and Hamid (2012), there is likely to be a non-significant connection between diversity and performance. Palich et. al., (2010) concluded the presence of a curvilinear linkage between the value of the firms and diversification. Berger et al. (2010); Nakane and Weitraub (2015) highlighted that there is a need for more empirical investigation of Sub-Saharan Africa dynamic financial systems.

Objective of the Study

To scrutinize the effect of deposits portfolio on the financial performance of commercial banks in Kenya.

Hypothesis of the Study

H₀: Deposits portfolio has no significant effect on the financial performance of commercial banks in Kenya.

II. LITERATURE REVIEW

Theoretical Framework

The basis of this research was Diamond's (1984) theory of financial intermediation and delegated monitoring. Reducing the overall cost of creating information that might help with incentive issue resolution is central to the idea of financial intermediation, which states that financial firms should split the benefits of the information's acquisition evenly. This idea proposed two ways to spread risk: increasing the number of agents in the middle, or spreading them out, and increasing the number of projects handled by a single intermediary, or doubling down on risk. It was the author's intention for the financial intermediary theory to function as a pure asset transformer, with the only option for diversification being the addition of independently dispersed projects by a single agent. Because the total cost of delegation for good monitoring of comparable expenses by several intermediaries via risk sharing is much higher than the monitoring costs for a large number of projects by a single intermediary, this reduces the per-entrepreneur prevailing costs of intermediation.

Mulwa (2018) states that this theory takes a cost- and risk-minimization stance when discussing diversification, and that due to the strong similarities between intermediaries and depositors, investing in a diverse portfolio within the intermediary is crucial for achieving net cost advantages. Given the above, it has been suggested that intermediation might be a feasible option when the costs of delegation are reduced, which is equivalent to the risk premium, by the consolidation of monitoring

under a single intermediary handling several projects. Financial intermediation and delegated monitoring provides an in-depth analysis of bank diversification under the risk and neutrality frameworks. As a result of diversity, the neutrality risk model predicts that the intermediary is less likely to go bankrupt and more likely to have enough loan profits to pay off a fixed debt claim placed by depositors. Based on the risk aversion model, financial institutions are able to increase their exposure tolerance with each loan via diversification, which in turn lowers the cost of urgent risk absorption for incentive reasons.

The theory was used in this research because it provides an explanation for the advantages of bank diversification. It does this by introducing the idea of cost benefits that result from a diverse intermediary and the efficiency in monitoring that is achieved by including hazards. The diversification of banking institutions' risk tolerance reduces the costs of delegated monitoring beyond what borrowers could achieve on their own. As a result, deposit money banks earn a higher return than fund suppliers/depositors do, and they also lower their bankruptcy risk by implementing measures to improve delegated monitoring efficiency.

Conceptual Review

This is a diagrammatic representation of the linear relationships between independent and the dependent variables as illustrated in figure 1.0.

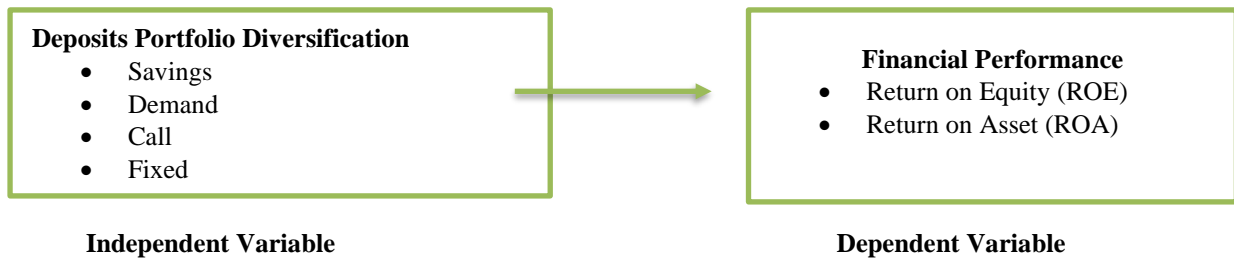


Figure 1.0: Conceptual Framework

Empirical Review

Capgemini (2017) surveyed 16,000 consumers in 32 countries, including both emerging and established economies. The results showed that young individuals with a strong grasp of technology are the ones who utilize financial technology. The data analysis of the study was done using a descriptive research approach. Consumers and various contexts may utilize the term "FinTech" in diverse ways, as we've already shown. When comparing FinTechs in developed markets to those in developing nations, it is clear that the services and products supplied by the former are vastly different. In Gikomba Market in Nairobi, Kenya, Otieno (2018) studied micro and small businesses to see whether there was a correlation between mobile loan use and interest rates. There was a positive and statistically significant relationship between the quantities borrowed and the interest rate, processing costs, and late payment penalties, according to the research. There was an upsurge in the use of mobile loans among Gikomba market merchants when interest rates, processing fees, and late payment costs were raised. The research found that there is a positive and statistically significant relationship between borrowing rates and quantities borrowed. The impact of interest rate quotas on the volume of loans extended by Kenyan commercial banks was studied by Kiseu (2017). Commercial banks' loan-making practices were unaffected by the interest rate regulation, according to the results. Some banks did reduce their loan books after the rule went into force, according to the report, but it wasn't enough to change the game for the whole sector. On the other hand, it was discovered that the credit expansion was not as dramatic as the policymakers had anticipated; in fact, it was just 0.2% higher than the pre-capping era.

For their 2017 research, Hosseyni and Khaledi analyzed the transaction costs associated with getting loans in rural Iran. On average, the data show that the transaction expenses associated with getting a loan are nine percent of the overall loan amount. Rural loan applicants face vastly varied fees when dealing with formal and semiformal lenders. Important factors of transaction costs, according to the results, include contractual form, loan amount, borrower's distance from financial center, and other borrower idiosyncrasies. Njiru (2017) spearheaded an investigation into how the cost of loan affects the bottom lines of micro and small businesses in the dairy industry in Kiambu County. The financial performance of small and medium-sized enterprises (SMEs) is positively correlated with the following variables: the age of the SMEs, the sizes of the SMEs, the interest payable in the year due to advances acquired over time, the amount of outstanding loans from financial institutions, and the estimations of loans acquired from SMEs.

The effect of credit data sharing on the credit market performance of Kenyan commercial banks was the subject of an inquiry spearheaded by Koros (2017). Findings indicate a clear correlation between credit data sharing (number of CRBs inquiries made by business banks), total advances progressed, and all resources when estimating market execution as fully advanced minus non-performing loans. Following the establishment and operationalization of the acknowledgment data component, credit market execution increased, leading to expansion. Commercial banks in Kenya had their loan performance evaluated by Bonaya (2017) after they shared credit information. According to the results, there is a negative correlation between credit information sharing, lending rate, total loans, and loan performance, as shown by the mobile loan uptake rate. Using Equity Bank as a case study, Okumu (2018) analysed how commercial banks' loan portfolios were affected by credit information sharing. A descriptive research approach was used in the study. Equity Bank's credit quality was shown to be significantly improved by exchanging credit information, according to the research. According to the study's findings, Equity Bank's non-performing assets are reduced when customer credit information is shared. Additionally, the study's findings demonstrate that CIS is very beneficial for NPL management. Credit reference bureaus' effects on Kenyan banks' credit performance were evaluated by Dalal (2018). Research shows that credit bureaus drive down interest rates for borrowers by making lenders more competitive. Respondents predicted a shortened credit application procedure when CRB reports were favorable, according to the results. The majority of respondents' companies employed credit scoring as a method of vetting potential customers, according to the report.

III. RESEARCH METHODOLOGY

The positivist guiding principle of this study was to scientifically describe the correlations between the dependent variable (banks' financial performance) and the independent variables (deposit diversifications), with the goal of objectively determining facts. The study used a descriptive correlational research approach, which evaluates the strength of correlations across variables by collecting and analyzing data from study units at a certain moment in time (Saunders et al., 2007; Mulwa, 2013). All of Kenya's commercial banks with valid licenses, as recorded by the Central Bank of Kenya, made up the study's target population. Data in secondary format was examined in the research. The research covered the years 2003–2018, or sixteen full years. Both Choi and Kotrozo (2006) and Mulwa and Kosgei (2016) used the Herfindahl-Hirschmann Index in order to determine diversification ratios. Using the STATA program, version 13.0, the data that was compiled was processed.

$$ROE_{i,t} = f(SD, DD, CD, FD)$$

$$ROA_{i,t} = f(SD, DD, CD, FD)$$

Upon linearization and parameterization which involved transforming the variables into natural logarithms the long run model was specified as:

$$ROE_{i,t} = \beta_0 + \beta_1 SD_{i,t} + \beta_2 DD_{i,t} + \beta_3 CD_{i,t} + \beta_4 FD_{i,t} + \alpha_i + \varepsilon_{it}$$

$$ROA_{i,t} = \beta_0 + \beta_1 SD_{i,t} + \beta_2 DD_{i,t} + \beta_3 CD_{i,t} + \beta_4 FD_{i,t} + \alpha_i + \varepsilon_{it}$$

And the short run model was:

$$ROE_{i,t} = \beta_0 + \lambda ROE_{i,t-1} + \beta_1 SD_{i,t} + \beta_2 DD_{i,t} + \beta_3 CD_{i,t} + \beta_4 FD_{i,t} + \alpha_i + \varepsilon_{it}$$

$$ROA_{i,t} = \beta_0 + \lambda ROA_{i,t-1} + \beta_1 SD_{i,t} + \beta_2 DD_{i,t} + \beta_3 CD_{i,t} + \beta_4 FD_{i,t} + \alpha_i + \varepsilon_{it}$$

SD, DD, CD and FD are savings deposit, demand deposit, call deposit and fixed deposits.

IV. RESULT AND DISCUSSION

Descriptive Statistics for Deposits Portfolio Diversification

This research looked at how commercial banks in Kenya fared after diversifying their deposit portfolios. Savings, demand, call, and fixed deposits were the operationalization of deposit portfolio diversification. The average savings was 9.24, the next highest at 9.02 for fixed deposits, 8.93 for demand deposits, and 8.89 for call deposits, according to Table 1. The fact that the p value for the Jarque-Berra coefficients was less than 0.05 indicates that none of the deposit portfolio components followed a normal distribution. Despite being the least popular, savings accounts showed the greatest diversity across banks due to their large standard deviations.

For symmetrical normal distributions, the research used a skewness of zero (0), and a typical result shows values between -3 and +3, as pointed out by Muigai and Muriithi (2017). Values that are negative indicate a left-to-right skewness, whereas

values that are positive indicate a right-to-left skewness. A distribution's kurtosis indicates how heavy its tails are. The distribution is considered normal if the skewness and kurtosis values are both 0. A distribution with fatter or heavier tails than typical is indicated by a kurtosis greater than three (Curran, West & Finch, 1996). With the exception of savings deposits, which exhibited platykurtic behavior, all kurtoses were greater than 3.

No normal distribution of the deposit component was found, and positive skewness showed that variety of funding had a considerably favorable influence on performance (Mulwa, 2013). All the variables, with the exception of savings deposits, displayed kurtosis of a leptokurtic type, as seen in the table. This is because all of the kurtosis coefficient indices were positive. All of the series' components had probability values of 0.000, indicating that the study's model was well-fitting. As a result, researchers expected that each of the deposit portfolio variables they measured would significantly affect the financial performance of Kenya's banking industry.

Table 1: Descriptive Statistics for Deposits Portfolio Diversification

	Savings	Demand	Call	Fixed
Mean	9.24	8.93	8.89	9.02
Median	7.56	8.77	8.68	7.78
Maximum	26.57	21.48	19.93	25.87
Minimum	2.24	1.40	2.03	1.10
Std. Dev.	5.25	3.38	2.95	4.39
Skewness	0.78	1.07	0.90	1.38
Kurtosis	2.69	5.43	5.27	4.73
Jarque-Bera	60.31	250.07	200.53	254.63
Probability	0.00	0.00	0.00	0.00
Sum	5301.91	5124.85	5101.69	5175.87
Sum Sq. Dev.	15820.98	6551.34	4986.01	11027.52
Observations	574	574	574	574

Correlation Analysis of Deposit Portfolio Diversification

The results shown in Table 2 demonstrate that savings, demands, call, and fixed deposits have a strong and favorable impact on both Return on Equity (ROE) and Return on Assets (ROA). The correlation coefficients (rho) for these variables are 0.657, 0.688, 0.675, and 0.636 for ROE, and 0.462, 0.578, 0.556, and 0.496 for ROA. These correlations are statistically significant with p-values less than 0.05. Collinearity was absent since none of the variables that were independent exhibited a correlation value over 0.8. These results were in agreement with those of Nafula (2013), who found a substantial correlation between the variety of deposits and the efficiency of Kenyan banks. Mulwa (2013) found a strong correlation between diversified deposits and successful Kenyan banks, and they were in agreement with that conclusion. According to the findings, in the Kenyan environment, lagging deposits of commercial banks have a substantial impact on bank profitability. The results have many policy implications that try to get banks to increase their deposits so that they may reap the benefits of local deposit mobilization. It is crucial to implement policies that encourage the increase of bank deposits in order to boost growth. According to these results, Lomuto (2008) was correct. This finding is in line with what Mulwa (2013) found when he used a regression model to determine the relationship between Sacco financial performance and the diversity of their funding sources. He found that SACCOs' overall financial health and performance were positively correlated with the diversity of their deposit funding sources. While this research noted that banks should not overlook deposit diversification when aligning their strategy, Olarewaju, Migiro, and Sibanda (2017) found the opposite to be true: a negative correlation between HHId and ROA.

Table 2: Correlation Analysis of Deposit Portfolio Diversification

		ROE	ROA	Savings	Demand	Call	Fixed
ROE	Pearson Correlation	1					
ROA	Pearson Correlation	.787**	1				
	Sig. (2-tailed)	0.000					
	N	574	574				
Savings	Pearson Correlation	.657**	.462**	1			
	Sig. (2-tailed)	0.000	0.000				
	N	574	574	574			
Demand	Pearson Correlation	.688**	.578**	.469**	1		
	Sig. (2-tailed)	0.000	0.000	0.000			

	N	574	574	574	574		
Call	Pearson Correlation	.675**	.556**	.489**	.777**	1	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
Fixed	N	574	574	574	574	574	
	Pearson Correlation	.636**	.496**	.541**	.578**	.581**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	574	574	574	574	574	574

** Correlation is significant at the 0.01 level (2-tailed).

Test of Hypothesis

The hypothesis posited that the composition of a bank's deposits portfolio does not have a statistically significant impact on its financial performance in Kenya. Table 3 demonstrates a notable impact of the deposits portfolio on the return on equity (ROE) with a statistically significant F-value of 47.5139 and a p-value of less than 0.05. The coefficient of determination, which is 0.7898, indicates that 78.98 percent of the variations in the return on equity (ROE) can be explained by savings, demand, call, and fixed deposits. The remaining portion was attributed to additional characteristics that were not included in the model. The presence of savings deposits had a statistically significant beneficial impact on the return on equity ($\beta = 0.5482$, p value <0.05). This suggests that a little increase in savings deposits led to a 0.5482 rise in return on equity (ROE), assuming that demand, call, and fixed deposits remained same. Furthermore, it is worth noting that demand had a statistically significant positive impact on return on equity ($\beta=1.1026$, p value <0.05). This implies that a one-unit rise in demand deposits resulted in a 1.1026 increase in return on equity (ROE), assuming that savings, calls, and fixed deposits remained unchanged. Call deposits had a statistically significant positive impact on the return on equity ($\beta=0.4672$, p value <0.05). This suggests that a one-unit rise in call deposits leads to a 0.4672 unit increase in return on equity (ROE), assuming savings, demand, and fixed deposits remain unchanged. Fixed deposits had a notable positive impact on the return on equity (ROE) with a beta coefficient of 0.5340 and a p-value less than 0.05. This implies that a one unit increase in fixed deposits resulted in a 0.5340 unit rise in return on equity (ROE), assuming that savings, demand deposits, and call deposits remained unchanged.

$$ROE = -7.6062 + 0.5482 * Savings + 1.1026 * Demand + 0.4672 * Call + 0.5340 * Fixed$$

Table 3: Fixed Effects on Effect of Deposits Portfolio Diversification ROE

Variable	Coefficient	Robust Std. Error	t-Statistic	Prob.
C	-7.6062	1.3585	-5.5989	0.0000
Savings	0.5482	0.0803	6.8264	0.0000
Demand	1.1026	0.1605	6.8695	0.0000
Call	0.4672	0.1848	2.5283	0.0118
Fixed	0.5340	0.0990	5.3937	0.0000
R-squared	0.7898	Mean dependent var		16.2697
Adjusted R-squared	0.7732	S.D. dependent var		14.7145
S.E. of regression	7.0074	Akaike info criterion		6.8038
Sum squared residuals	26074.010	Schwarz criterion		7.1298
Log likelihood	-1909.6810	Hannan-Quinn criterion.		6.9310
F-statistic	47.5139	Durbin-Watson stat		2.1899
Prob(F-statistic)	0.0000			

The effect of deposit diversification on ROA was described in Table 4 of the FEM model. F= 28.5853, p value <0.05) shown that the deposits portfolio had a substantial impact on ROA. With a coefficient of determination of 0.6933, we can see that savings, demand, call, and fixed deposits explained 69.33% of the variation in ROA. Other characteristics that were not included in the model accounted for the rest. The return on assets (ROA) of Kenyan banks was positively, although not significantly, affected by savings deposits ($\beta = 0.0341$, p value <0.05). After controlling for demand, call, and fixed deposits, ROA improved by 0.0341 units due to unit increments in savings deposits.

Additionally, with a beta value of 0.2046 and a p-value less than 0.05, demand significantly impacted ROA. This meant that, with savings, calls, and fixed deposits held unchanged, ROA improved by 0.2046 for every unit increment in demand deposits. Additionally, ROA was positively impacted by call deposits ($\beta= 0.1128$, p value <0.05), which brings us to our third point. This meant that, all else being equal, a one-unit increase in call deposits would result in a 0.1128-unit rise in ROA. Finally, fixed deposits had a favorable and substantial influence on ROA ($\beta=0.1079$, p value <0.05). Assuming no change to savings, demand, or calls deposits, this suggested that a one-unit rise in fixed deposits resulted in a 0.1079-unit

gain in ROE. Demand deposits had the highest effect on ROA followed by call and fixed deposits respectively. Savings deposits had the lowest and non-significant effect because interest is payable on all savings deposits thus minimizing the returns derived from this deposits type.

$$ROA = -2.1128 + 0.0341 * Savings + 0.2046 * Demand + 0.1128 * Call + 0.1079 * Fixed$$

Table 4: Fixed Effects on Effect of Deposits Portfolio Diversification on ROA

Variable	Coefficient	Robust Std. Error	t-Statistic	Prob.
C	-2.1128	0.3921	-5.3877	0.0000
Savings	0.0341	0.0232	1.4706	0.1420
Demand	0.2046	0.0463	4.4149	0.0000
Call	0.1128	0.0533	2.1152	0.0349
Fixed	0.1079	0.0286	3.7746	0.0002
R-squared	0.6933	Mean dependent var		2.0040
Adjusted R-squared	0.6691	S.D. dependent var		3.5163
S.E. of regression	2.0227	Akaike info criterion		4.3187
Sum squared residuals	2172.5860	Schwarz criterion		4.6448
Log likelihood	-1196.4800	Hannan-Quinn criterion.		4.4459
F-statistic	28.5853	Durbin-Watson stat		1.7984
Prob(F-statistic)	0.0000			

Table 5 shows that diverse deposit portfolios had a substantial impact on the financial performance of Kenyan banks (Wald Chi square = 329.82, p value < 0.05). Return on equity (ROE), savings, demand, call, and fixed deposits all had noteworthy beneficial effects. Positive Coefficients of 0.5612, 0.9180, 0.04314, and 0.3605 on savings, demand, call and fixed deposits was observed in relation to return on equity.

$$ROE = -8.2062 + 0.2474 * ROE_{t-1} + 0.5612 * Savings + 0.9180 * Demand + 0.4314 * Call + 0.3605 * fixed$$

Table 5: Dynamic Panel Model on Effect of Deposits Portfolio Diversification on ROE

Arellano-Bond dynamic panel-data estimation		Number of obs	=	574		
Group variable: id		Number of groups	=	39		
Time variable: year						
		Obs per group	min =	9		
			avg =	14.717949		
			max =	16		
Number of instruments	= 123	Wald chi2 (5)	=	329.82		
		Prob > chi2	=	0.0000		
One step results						
	Roe	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
	Roe					
L1.		.2474928	.0483179	5.12	0.000	.1527914 .3421941
Savings		.5611881	.0805092	6.97	0.000	.4033929 .7189834
Demand		.9180322	.1758853	5.22	0.000	.5733032 1.2627610
Call		.4313731	.1947279	2.22	0.027	.0497134 .8130324
Fixed		.3604546	.1030550	3.50	0.000	.1584705 .5624386
_cons		-8.2062150	1.5097020	-5.44	0.000	-11.1651800 -5.2472540

In order to check the likelihood of the model being estimated, the Sargan test was used. Against the alternative of its non-satisfaction, the null hypothesis claimed that the basic requirements for the model were met. The model was successfully recognized, according to Table 6's findings, as the p-value was less than 0.05.

Table 6: Sargan Test for Model

Sargan test of overidentifying restrictions			
H0: overidentifying restrictions are valid			
chi2 (117)	=		194.2658
Prob > chi2	=		0.0000

Table 7 shows that banks in Kenya saw a notable impact from diversifying their deposit portfolios on their financial performance (Wald Chi square = 228.28, p value < 0.05). The effects of savings, demand, fixed deposits, and delayed return on ROA were all positively significant. Call deposits had a beneficial impact on return on assets (ROA) for Kenyan banks, however it was not statistically significant.

$$ROA = -2.3763 + 0.5542*ROA_{t-1} + 0.0498*Savings + 0.1891 * Demand + 0.0591 * Call + 0.0636*fixed$$

Table 7: Dynamic Panel Model on Deposits Portfolio Diversification and ROA

Arellano-Bond dynamic panel-data estimation		Number of obs	=	574		
Group variable: id		Number of groups	=	39		
Time variable: year						
		Obs per group	min =	9		
			avg =	14.717949		
			max =	16		
Number of instruments	=	123	Wald chi2 (5)	=	228.28	
			Prob > chi2	=	0.0000	
One step results						
	Roa	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]
	Roa					
L1.		.5542088	.0463433	11.96	0.000	.4633775 .6450400
Savings		.0498238	.0227775	2.19	0.029	.0051807 .0944669
Demand		.1891295	.0491855	3.85	0.000	.0927277 .2855313
Call		.0591408	.0545080	1.08	0.278	-.0476929 .1659745
Fixed		.0636112	.0292052	2.18	0.029	.0063700 .1208523
_cons		-2.3760570	.3976996	-5.97	0.000	-3.1555340 -1.5965800

To check whether the model under estimate was possible, the Sargan test was used. According to the null hypothesis (H0), the model's underlying requirements were met, as opposed to the alternative that they were not. Since the p-value was less than 0.05, the model was accurately recognized, according to the results shown in Table 8.

Table 8: Sargan Test for Model

Sargan test of overidentifying restrictions		
H0: overidentifying restrictions are valid		
chi2 (117)	=	258.0345
Prob > chi2	=	0.0000

Both dynamic panel models using ROE and ROA as bank performance indicators have a very small number of instruments (123) in relation to the number of observations (574), indicating that the proliferation of instruments is not an issue. The instrument set was validated and found to be more exogenous according to the substantial Sargan test. The models were evaluated and the findings and observations based on system GMM estimates were also validated by these results of the diagnostic tests of system GMM in the models. Incorporating the years as a temporal variable helps to account for economic cycles. There were 39 different banks included in the sample for this analysis. Groups were observed with an average of 14.72 and a range of 9–16.

Consistent with previous research, our analysis found that a mix of different types of financing—including savings, demand, call, and fixed deposits—had a favorable impact on performance (Baele et al., 2007; Mulwa, 2013; Oyewobi et al., 2013; Mulwa, 2015). Banks would not be able to achieve their projected performance if their deposit and loan portfolios are not handled appropriately. Odhiambo (2008) defined a portfolio in this context as a combination of deposits characterized by cost and term structure and a mix of loans characterized by term structure and lending rates; the present investigation lends credence to this definition. Banks' risk-taking and the impact of that risk-taking on performance will be shaped by these mixtures. In their study, Olarewaju, Migiro, and Sibanda (2017) identified many important aspects affecting the banking business. These elements include branch network count, national income levels, and stability. Deposits have a negative impact on the performance of financial institutions.

While this study's findings supported the idea that the customer deposits variable had a negative impact in all regressions, they were at odds with the discussion paper by Nafula (2003) that was given at KIPPRRA. Previous research by Gul et al.

(2011) found that deposits—including demand, savings, and fixed deposits—had a negative correlation with ROCE. However, the current results contradict this. Additionally, the economic instability and difficulties experienced by most of the nations studied during the specified time period may have contributed to the depicted negative observations of bank diversification deposits and performance. This is because a significant portion of banks' funding comes from customers' accounts, and banks' relatively low levels of diversity make them vulnerable to competition, which could force them to take a hit from economies of scale and a broader array of customer deposits.

V. CONCLUSION AND RECOMMENDATION

Research in Kenya found that banks' bottom lines improved significantly once they diversified their deposit accounts. Optimizing returns and minimizing operational expenses linked with deposits requires individual banks to assess their strengths and weaknesses in relation to unique deposits. Since savings and demand deposits contributed the most to performance, that's where banks should put their focus. Even while call deposits have a negligible impact on banking performance, their contribution is crucial, thus more should be done to encourage them. Results from this study were consistent with those from previous research by Baele et al. (2007), Mulwa (2013), Oyewobi et al. (2013), and Mulwa (2015). In contrast, Nafula (2003) argued in a discussion article that the customer deposits variable had very significant negative coefficients in all regressions. The results also contradicted those of Gul et al. (2011), who found that all three types of deposits—demand, savings, and fixed—had a negative correlation with ROCE.

Financial institutions should diversify their deposit bases; this may be accomplished by using technologically aided instruments that facilitate the expansion of banking services to the unbanked population. Given the diverse range of consumers that Kenyan banks serve, it is important that measures be tailored to each individual bank's needs, since savings have the greatest impact on financial success. Financial institutions that accept deposits should put measures in place to improve their management's capacity to meet their short-term, regular, and occasional withdrawal and obligation needs, so that their liquidity positions are strong enough to greatly boost stability and profitability.

The researcher concluded that the Central Bank of Kenya, as the country's top bank, should ensure stringent supervision, monitor the health of deposit money banks, and increase their credit portfolio benchmark in order to prevent a collapse and make the financial sector healthier. Since it is hard to totally prevent defaults, it is important to collect advances and credit carefully and handle the risks of defaults properly. Effective portfolio management necessitates the establishment of appropriate safeguards. Regulators and policymakers should consequently pay close attention to financial institutions' diversification strategies when formulating future laws and regulations pertaining to commercial banks.

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