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Joint Effect of Interest Rate Spread, Liquidity Creation and Firm Characteristics on Firm Performance

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Abstract

The study had a general objective to evaluate the relationship among interest rate, liquidity creation, firm characteristics, and performance of commercial banks in Kenya. The study relied on balanced panel data where secondary data was collected from 38 active financial institutions in Kenya for a ten-year period from 2008-2018. The study used a descriptive research design and was subjected to random effects panel regression analysis. Hypotheses were tested at 95 percent confidence levels ($p<0.050$) to determine the effect of the independent variable, moderating variable and intervening variable on the performance of the banks which was the dependent variable. The results indicated that interest rate spread as an independent variable, was significant in determining the performance of the banks. The study also established that liquidity creation was a non-intervening variable in the relationship between interest rate spread and performance. Firm characteristics including firm size, age and ownership did not exert a moderating effect on the relationship between interest rate spread and performance. Moreover, the results revealed a significant joint effect of interest rate spread, liquidity creation and the firm characteristics on performance. The results of this study add to existing knowledge by using liquidity creation as an alternative metric for performance measurement, which the banks can utilize to remain afloat by meeting their immediate monetary demands for their external clients and their internal daily financial requirements. Maintaining a narrowed spread in interest rates is also crucial in maintaining a competitive edge in an increasingly competitive financial market. The study also contributes to improving the existing literature and body of information in determining the predictors of firm performance in Kenya. It provides evidence against firm characteristics as unreliable predictors.

Keywords: *Interest rate spread, liquidity creation, firm characteristics, firm performance*

1. Introduction

Interest rate spread is the difference linking the rates that the depositor is paid and the rate that the borrower is charged (Brock & Rojas, 2000). Generally, it is the net income relative to all earning resources of an institution. The major risk of a volatile interest rate regime is that it reduces the equity value, lowers the asset returns and raises the cost of funds for the firm. Risk-averse commercial banks have a smaller spread compared to risk-neutral commercial banks. According to Emmanuelle (2003), the spread of interest rates is affected by fiscal and monetary policy,

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alongside several specific aspects of commercial banks. Whereas a narrow spread can be assumed to portray a banking sector that is dependable and reliable when variance on the rate charged on both deposit and loan is huge, conclusively, the operating environment within the existing system is assumed to be very weak, and its constraints the country's economic expansion (Emmanuelle, 2003).

Liquidity creation is the process through which the banks generate cash and cash equivalent by transforming illiquid assets into liquid liabilities (Diamond & Rajan, 2000). From a banking perspective, liquidity is the amount of cash and other assets these institutions have available to pay bills and meet short-term business and financial obligations quickly. It can also be said to be the capacity of a commercial bank to be in a position to finance its growth and settle its short and long-term monetary requirements without incurring excessive costs (BIS, 2008). The optimum level of liquidity is strongly associated with prudent operations in commercial banks. If liquidity is not managed effectively, this can lead to low profitability and insolvency and finally extinguish shareholder value while negatively affecting other banks (Berger & Bouwman, 2009).

Firm characteristics are the internal factors and other macroeconomic indicators of the respective banks expected to influence their decision-making, thus affecting performance (Balk & Gort, 1993). These characteristics are aspects that are mostly under management control. Some of these characteristics include the ownership of the firm, its size, and years of existence.

According to Lin et al. (2008), the resultant outcome while pursuing internal and external objectives should be considered as the firm performance. In their study, however, Richard et al. (2009) alluded that the output of any firm may not only be attributed to its internal effectiveness but the efficiency of the market it operates on. Thus, external factors entirely outside the control of the firm's management may contribute to the successful performance of a firm. Achrol et al. (2003) furthered the argument and stated that the ability of the management to achieve the set goals greatly determines the firm's performance.

1.2 Objective of the Study

The study objective was thus to ascertain the joint effect of interest rate spread, liquidity creation, and firm characteristics on performance of commercial banks in Kenya.

2. Literature Review

2.1 Theoretical Review

The study was based on four theoretical perspectives; Liquidity Preference Theory, Asset Liability Management Theory, Modern Portfolio Theory and Upper Echelon Theory. This study is anchored on the Liquidity Preference Theory, which was introduced by Keynes. According to the theory, the decision on how much income to save or spend is defined as liquidity preference, and interest rates are determined by the overall demand and supply of money (Keynes, 1936). Transaction, precautionary, and speculative needs influence this demand (Akpan, 2004). Transaction needs arise due to limited incomes and continuous expenditures, leading individuals to keep assets in cash for daily requirements. Precautionary needs involve holding cash to mitigate future unforeseen outcomes, directly proportional to income. Speculative needs depend on interest rate movements, creating an inverse relationship. This theory explores interest rates from both demand and supply perspectives, emphasizing the role of monetary policies (Keynes, 1936). However, it faces some limitations, such as indeterminacy disorder in interest rate determination until earnings are established (Hicks, 1980). The theory also oversimplifies investor behavior, assuming a binary choice between riskless cash and risky bonds. Real factors are often neglected, and applicability is limited to well-organized markets (Clair, 2004). Despite these limitations, it plays a crucial role in understanding the impact of interest rates on monetary policies and the banking sector's performance, especially in managing interest rate spread and liquidity creation.

The Asset Liability Management Theory, pioneered by Leibowitz, focuses on managing assets and liabilities differently based on the firm's stage in the macroeconomic cycle (Leibowitz, 1986). It involves aligning the effects of interest rates on assets and liabilities to mitigate risks and enhance profitability. By matching cash inflows to outflows, firms can control liquidity risks associated with market, credit, operational, and business factors (Choundhry, 2011). The theory aims to optimize returns while managing exposures, providing insights into liquidity creation and risk control. However, it faces challenges such as

the need for accurate data, differing institutional frameworks, and the reliance on estimates and assumptions. Its significance lies in its ability to link returns and top management team skills to the liquidity creation variable, emphasizing the compromise between returns and liquidity initially (Leibowitz, 1986). As firms grow, effective liquidity management improves income and overall performance.

The Modern Portfolio Theory, developed by Harry Markowitz, guides investors in constructing portfolios to minimize risk for a given return (Iraya, 2014). The theory emphasizes diversification to reduce unsystematic risk while acknowledging the inherent market/systematic risk. It assumes investors are risk-averse and aims to balance risk and return in a portfolio. However, it faces challenges in aligning with real financial markets due to assumptions of perfect rationality and information symmetry (Howells & Bain, 2008). The model assesses assets based on variance rather than underlying risk. The theory serves as a foundation for understanding the dependent variable of firm performance by evaluating portfolios for positive returns. It aids investors in navigating changing interest rate regimes and limited cash resources, contributing to sound decision-making and positive shareholder outcomes.

Upper Echelon Theory portends that top management characteristics such as tenure and age can predict the outcome of the firm in terms of performance (Nielsen & Nielsen 2013). The management's main role is to make deliberate decisions regarding the current and future path of the organization, by employing tactics and strategists which will help realize the vision. Despite criticism that the theory lacks construct validity, explanatory power and the ability to make practical prescriptions, it demonstrates that top management teams, as senior members of the organization's hierarchy, has direct control over the company's strategic direction and by extension, the expected returns (Michael & Hambrick, 1992).

2.2 Empirical Review

This is critical since as it assists the researcher in placing their study into a historical and intellectual context by applying a logical methodology informed by previous scholars.

Rusuhuzwa and Nyalihama (2016) while analyzing the components of rates of interest spread in Rwanda using dynamic panel data generalized method of moment’s estimation, utilized six financial institutions as the population for their research study. Utilizing financial institution bank-level quarterly data, their findings verified that risks connected with providing out funds

affect the rates of interest spread. Using an extremely low population made it impossible to generalize the results to Rwanda's economy and other African economies.

Owusu-Antwi (2017) studied the impact of interest rate spread on bank profitability in Ghana. Twenty-eight commercial banks made up the study's sample. Using unbalanced panel data from 1992-2015, they analyzed the macroeconomic and bank-specific variables that affected the banks' returns. They concluded that the interest rate spread was affected by factors unique to each bank. These factors were return on asset, net interest income, operational cost and total assets.

Kiyota (2009) sampled twenty-nine banks from 2000 to 2007 in Sub Sahara African Countries. While interrogating their operation and below-the-line efficiency, he employed a two-stage process using stochastic frontier and Tobit regression approaches. In comparison, nonlocal banking institutions' returns and operational effectiveness were more sophisticated than domestic ones. The study, however, suffered from a lack of a precise enough cross-sectional analysis due to data deficiencies for some periods.

Ibe (2013) investigated liquidity management in Nigeria, suggesting increased holdings in treasury bills and certificates. The study's small sample size and potential impact on economic growth raised concerns about generalizability, and the mediating role of liquidity creation was not explicitly examined.

Gedajlovic and Shapiro (2002) analyzed data from Japan's 334 operating companies between 1986 and 1991. Cross-sectional and collective time series data were used. Their findings, that a higher concentration of ownership was associated with better financial results aligned with agency theory's predictions. The study also found evidence of a more significant profit redistribution effect: cash flows from more lucrative to less profitable businesses.

Kartiningsih and Daryanto (2020), in their casual study on the profitability effect by firm characteristics between 2014 and 2018, was based on twelve firms listed in the Indonesia stock exchange. The data analysis was mainly done using descriptive techniques before being subjected to multiple regression analysis. The study concluded that firm size, liquidity, age and leverage

significantly and positively affect profitability. The study, however, suffered from the limited number of the companies' information utilized during the study. This made it difficult to generalize the results to the industry.

In a study in Tanzania, Kipesha (2013) reviewed how age and level of operation impacted the efficiency of undertaking in a microfinance business. Panel data was used from thirty microfinance firms that had done reports for not less than five cycles. The findings showed that the age of firms, which indicates their experience, had a favorable impact on effectiveness, sustainability, as well as earnings degrees but a negative influence on the productivity of these organizations. The study on microfinance, however, may not be robust enough to be generalized in the banking industry.

Ahmad, Mohammad and Muhamad (2013) examined liquidity management in Malaysian Islamic banks, revealing that economic conditions influenced liquidity creation. While underscoring the crucial role of steady returns, the study's small sample size limited generalizability and omitted other potential moderating variables.

Samad (2004) explored bank performance in Bahrain, finding no major differences in liquidity and profitability between conventional and Islamic banks. The study's limited sample size raised concerns about drawing broad conclusions.

Kumbirai and Webb (2010) studied South African banks, emphasizing credit quality, profitability, and liquidity. The 2007 global crisis impacted initial performance, but financial ratios offered insights into liquidity effects. The study, however, faced challenges related to backward-looking data and susceptibility to manipulation.

Hamid and Akhi (2016) analyzed liquidity and performance in Bangladesh's pharmaceutical industry, finding no statistically significant correlation. The study's small sample size and Bangladesh's economic growth posed challenges in generalizing the results.

Tesfaye (2012), in their review of the determinant of bank liquidity and its impact on bank performance in Ethiopia, employed the balanced fixed effect panel regression. The study covered

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the period from 2000 to 2010 and involved eight banks in the study population. The results also deduced that bank size, liquidity, and capital adequacy positively influenced financial performance, whereas, statistically, short-term interest rate and non-performing loans did not directly influence bank returns.

Muhmad and Hashim (2015), in their study on bank performance in Malaysia, conducted an analysis encompassing the period between 2008 and 2012. They evaluated both domestic and foreign banks using the CAMEL model. Regression analysis was utilized, and the study deduced that capital adequacy, liquidity asset quality, and earning quality had a notable impact on Malaysian banks' returns. Other CAMEL ratios needed to be tested to ascertain the results of the outcome and to make the recommendation conclusive.

Research Hypothesis: - H_{01}: The Interest Rate Spread, Liquidity Creation, and Firm Characteristics have no significant joint influence on Performance of Commercial Banks in Kenya.

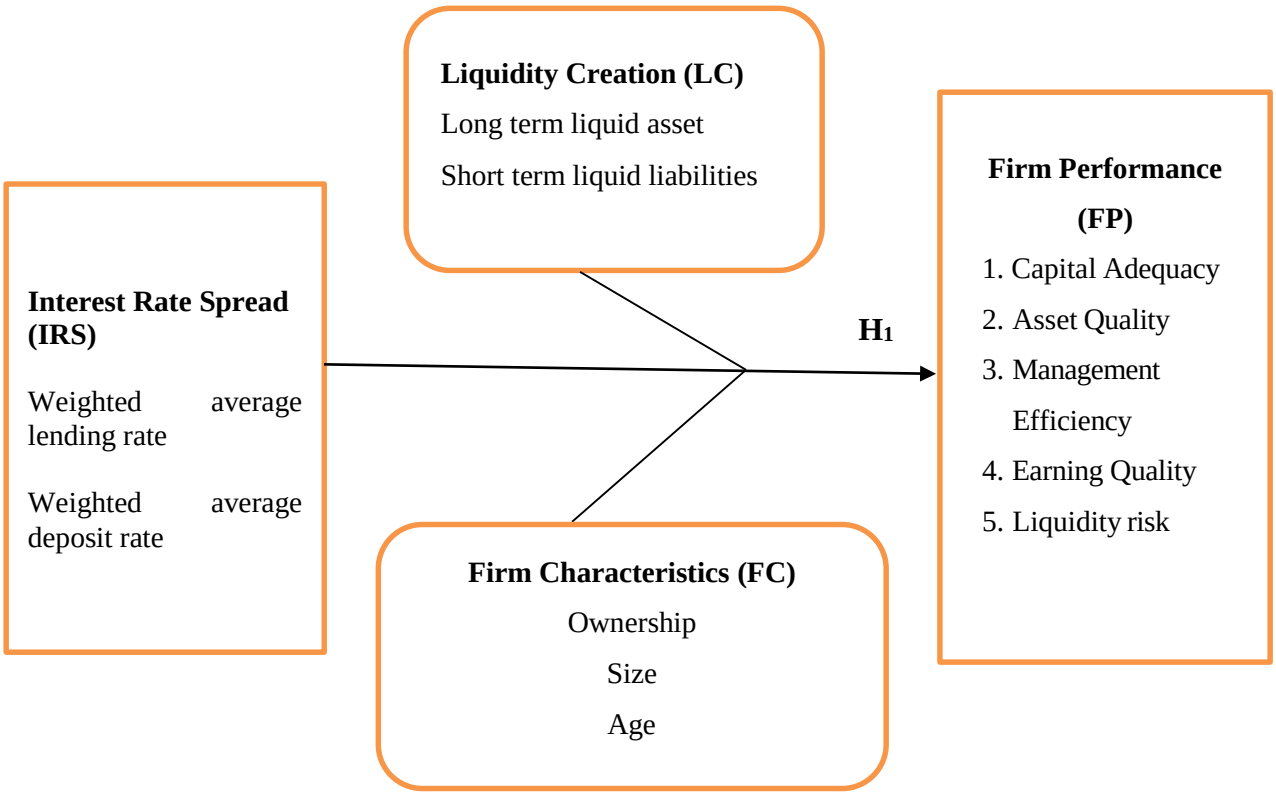

Figure 1: Conceptual Framework

3. Methodology

This study adopted a descriptive design grounded on the positivism research philosophy. Positivism embodies the view that knowledge is dependent on observable evidence that can also be experienced (Cooper & Shindler, 2008). The positivist view was adopted because the study sought to establish gaps, test the hypothesis and deduce knowledge from the resulting observations while considering quality or essence of the participants' experience. A descriptive design allows for a fine-grained description of a phenomenon occurring within a given population (Mugenda & Mugenda, 2003). Therefore, this design was considered ideal for this study. Besides, it enabled generation of a representative picture of the target population over time.

The study targeted the 42 commercial banks operational as of December 2018. A census approach was used to study these banks. The data collected was secondary in nature and covered the period 2008 to 2018. STATA software was employed in the analysis of the data. Descriptive statistics including mean, standard deviation, minimum and maximum were computed. Panel regression analysis was utilized in assessing the joint influence of interest rate spread, liquidity creation and firm characteristics on performance of commercial banks in Kenya.

Diagnostic tests: - The tests undertaken to enable further analysis included normality, linearity, heteroscedasticity, multicollinearity, autocorrelation and stationarity tests. The results were interpreted using significance of t-statistic, F- statistic, adjusted R squared (R^2) in establishing the relationship among the variables.

Model Specification: -The study assumed a null hypothesis (H_0) that the random effects model is appropriate while fixed effects model was the alternative hypothesis (H1). Table 1 presents the results of the Hausman test, which assesses whether the fixed effects random effects model is more appropriate for the given data. The Hausman test statistic is calculated as7.34 with a p-value of 0.1191. A p-value less than the 5% significance level would suggest that the fixed effects model is more appropriate, indicating the presence of unobserved individual-specific effects. Conversely, a larger p-value would suggest that the random effects model is preferable. In this case, the p-value of 0.1191 exceeds the threshold of 0.05, indicating that there is insufficient evidence to reject the

null hypothesis that the random effects model is appropriate. Therefore, based on these results, the random effects model was more suitable for the data.

Table1: Results of the Hausman Test

chi2	7.34
Prob > chi2	0.1191
DF	379

4. Data Presentation and Empirical Analysis

4.1 Descriptive Statistics

The descriptive statistics presented on the Table 2 below are mean, range, maximum, minimum, standard deviation, skewness, and kurtosis. The detailed descriptive statistics are elaborated in relation to the study's variables.

Table 2: Summary of Descriptive Statistics

Variables	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Interest Rate Spread (IRS)	380	1	2	3	2.38	0.51	0.12	-1.27
Age (A)	380	73	5	78	38.03	16.63	0.22	-0.52
Firm Performance (FP)	380	0.060	0.050	0.110	0.079	0.018	0.163	-0.873
Liquidity Creation (LC)	380	450	350	800	551.97	132.02	0.11	-1.08
Firm Size (S)(KES000000)	380	975970	30	976000	132000	183000	0.70	-0.41
Valid N (list wise)	380							

The banks' average interest rate spread was 2.38, with a standard deviation 0.51. This suggests that banks had a significant margin for profit in their lending and investment activities. However, it is important to note the standard deviation of 0.51, indicating some variability in this spread among the banks. The age of banks in the sample revealed a wide spectrum of historical experience. With an average age of 38.03 years (SD =16.83) it was apparent that these banks had been operating for a significant period during the study period. However, the standard deviation of 16.83 indicates considerable historical variation. The average liquidity creation, which stood at 551.97 (SD = 132.02), suggests that, on average, these banks were capable of creating liquidity amounting to 552 units during the study period. However, the standard deviation of 132.02 underlines the variation in this ability. The variation in firm size was indicative of differences in the scale of operations and capabilities among the banks. The low standard deviation of 0.018 in performance suggests that there was relatively limited variability in performance, implying a degree of consistency in historical profitability across these banks. The average ownership score of 0.47 implies that, on average, 47% of the banks in the sample were foreign-owned during the study period while the others were domestically owned. However, it is important to note that there was no standard deviation provided for this variable, as ownership was a binary classification (0=Domestic, 1=Foreign).

The outcome of skewness and kurtosis of the variables, which are indicators of distribution, symmetry, and the data tails in relation to the normal distribution were within range. All variables are skewed to the right, with interest rate spread being (0.12), Liquidity Creation (0.11), Age (0.22), firm size (0.70), and Firm performance (0.163). This means that the right tail of all the variables was long relative to the left tail. On the same note, all the variables had a negative kurtosis, which indicates that the distribution peaked with thick tails. The distribution of the study variables was normal, as indicated by the skewness coefficients, which was within the normality margin of -2 and 2.

Correlation Analysis: - While Pearson product– moment correlation, the results on Table 3 below shows a strong positive relationship between liquidity creation and firm performance, as shown by the correlation coefficient ($\rho = 0.81$). This relationship was significant at 95% and 99% confidence levels. The correlation coefficient between firm performance and interest rate spread

($\rho = 0.71$) was also strongly positive and statistically significant at both confidence levels, just as the latter related to liquidity creation ($\rho = 0.63$). There was however, a weak correlation between the other variables.

Table 3: - Correlation Analysis of the Variables in the Model

	Interest Rate Spread (IRS)	**Age (A)**	**Firm Performance (FP)**	**Ownership (O)**	**Liquidity Creation (LC)**	**Firm Size (S)**
Interest Rate Spread (IRS)	1					
Age (A)	0.02	1				
Firm Performance (FP)	0.71**	0.01	1			
Ownership (O)	0.01	0.04*	0.02	1		
Liquidity Creation (LC)	0.63**	0.00	0.81**	0.07	1	
Firm Size (S)	-0.02*	-0.01	0.02	-0.01	0.05	1

Results

The combined effect of the study variables (interest rate spread, liquidity creation and firm characteristics) on the performance of commercial banks was tested to establish these variables' influence levels. The null hypothesis was represented as follows:

The joint effect of interest rate spread, liquidity creation, and firm characteristics on commercial banks' performance in Kenya is not significant.

The model was presented as: -

$$FP_6 = \beta_{06} + \beta_{16}IRS + \beta_{26}LC + \beta_{36}O + \beta_{46}S + \beta_{56}A + \varepsilon_6$$

Where: - FP6= Firm Performance; β06= Regression Constant; β16, β26, β36, β46, β56, β66 = Coefficients; IRS=Interest Rate Spread; LC=Liquidity Creation; O- Ownership; S- Firm Size; A – Years of existence; ε4= Error term.

The results of the model was as follows: -

Table 4: - Model Results for the Joint Effect of Interest Rate Spread, Liquidity Creation and Firm Characteristics on Firm Performance

	Performance			
	RE Coefficients	*SE*	*Z*	*p*
Constant	0.025	0.011	1.82	.069
Interest rate spread	0.026	0.001	20.13	<.001
Liquidity creation	-0.00002	0.000	-2.99	.003
Firm age	-0.00001	0.000	-0.29	.601
Ownership	0.0004	0.001	0.29	.774
Firm size	0.0002	0.0004	0.52	.601
R^2	.521			
Wald χ^2 (5)	406.40			<.001
Observations	380			

From Table 4 above the R-squared value (R^3 = 0.521) indicates that the model accounts for approximately 52.1% of the variance in firm performance. This signifies a substantial proportion of the variability in the dependent variable (firm performance) that is explained by the combined influence of interest rate spread, liquidity creation, and firm characteristics. While this R- squared value suggests a relatively strong explanatory power of the model, it also implies that there is a portion of the variance in firm performance that remains unexplained. Therefore, other unmeasured factors or variables not included in the model may contribute to the remaining variability.

The Wald chi-square test for joint significance revealed a highly significant value, Wald χ^2= 406.40, $p < .001$. This outcome demonstrates the collective impact of interest rate spread, liquidity creation, and firm characteristics on firm performance.

With respect to individual coefficients, it is evident that interest rate spread significantly and positively influences firm performance ($\beta = 0.026$, $z = 20.13$, $p < .001$). This implies that, all else being equal, a one-unit increase in interest rate spread is associated with a 0.026-unit increase in firm performance. However, liquidity creation exhibited a negative influence on firm performance ($\beta = -0.00002$, $z = -2.99$, $p = 0.003$), indicating that an increase in liquidity creation is associated with a slight decrease in firm performance. Firm age, ownership, and firm size did not exhibit statistically significant relationships with firm performance, as indicated by their coefficients and p-values.

Given the significant Wald chi-square test result, there is ample evidence to reject the null hypothesis. The collective effect of interest rate spread, liquidity creation, and firm characteristics is statistically significant, signifying their joint influence on the performance of commercial banks in Kenya.

Discussion and Findings: -The study investigated whether interest rate spread, liquidity creation and firm characteristics significantly affect firm performance of commercial banks operating in Kenya. Given that the RE model was used to model this relationship, the Wald chi-square statistic was used to assess the joint effect of the variables of interest on firm performance. The analysis revealed a significant Wald chi-square statistic thus suggesting that collectively, interest rate spread, liquidity creation, firm size, firm ownership and firm age exert a significant effect on firm performance. It also emerged that individually, not all variables had a significant effect on firm performance, only interest rate spread and liquid creation had significant influence. In particular, controlling for other variables, interest rate spread had a positive effect while liquidity creation had a negative effect.

These findings are inconsistent with the view that when the firm's size increases, the sustainability of returns and overall earnings of a firm scales downward according to Kipesha (2013). On the same note, Arif et al. (2013) research on Pakistani banks uncovered that the bank size positively impacted their profitability. Nevertheless, Aremu et al. (2013) agree with our research findings that bank size does not significantly impact banks' profitability.

5 Conclusions and Recommendations

The spread of interest rates had an extensive influence on the returns of the banking sector. This was because it was a significant factor affecting performance. This outcome was similar to a previous research study conducted in the European banking sector by Merceica et al. (2007), which showed a converse link between the bank's returns in relation to the interest rate spread. Liquidity creation on the other hand also had a major impact on the bank's returns in relation to the interest rate spread. Including liquidity creation in the model significantly improved the predictability of firm performance by interest spread rate.

Another deduction is that firm ownership had no significant influence on the bank's returns in relation to the interest rate spread. In the same light, a firm's size did not significantly affect the association of interest rate spread and bank performance. While Shepherd (1972), in his study, discovered that size leads to a deceleration of economic growth, Niresh and Velnampy (2014), on the other hand, found that size may not have any major and impactful effect on the banks' returns in the long run. In determining returns using ROA, Haron (2004) also confirmed no direct causal association exists between bank size and its ultimate returns. Thus, mergers that increase the size of a firm may not necessarily improve performance. The result that was reached by Hassan and Bashir (2003) goes a long way to prove that a firm's returns are not directly proportional to its size. Whittington (1980) had found that firm size does not have any effect on profitability. The firm's years of experience which was equated to its age was also not found to have a significant influence while determining the causal link on performance attributable to interest rate spread in the Kenyan banking sector. Finally, liquidity creation and interest rate spread jointly were significant in determining the commercial banks' performance in Kenya.

Commercial banks' performance may be affected by variables other than those considered during this study undertaking. Among those factors are the regulatory and control measures which limit the operations of these commercial banks. Thus, further research may be undertaken considering other factors to compare their effects on the bank's performance.

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