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Financial Innovation and Financial Performance of Tier 3 Commercial Banks in Kenya

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ABSTRACT : Banks play very important role in economic development of nations despite that they face a myriad of challenges including financial innovation in establishing and maintaining financial performance. General objective was to assess financial innovation on financial performance of Tier 3 Commercial Banks in Kenya. Specifically, study was to establish moderating effect of bank regulatory framework on financial innovation and financial performance. Schumpeterian growth theory adopting explanatory research design. Target population constituted all managers drawn from Tier 3 commercial banks in Kenya. Proportionate sampling and simple random sampling were employed in picking managers. Questionnaire was used in collecting data for financial innovation while secondary data was collected for financial performance from published annual returns obtained from Central Bank of Kenya. Pearson product moment correlation analysis and multiple regression analysis were employed. Sample size was 129. Findings indicated that correlation matrix of financial innovation ($r=0.365$, $p=0.000$) had linear relationship with financial performance. Regression results indicated that coefficient of financial innovation was 2145.08, $p=0.000<0.05$implying positive and significant while bank regulatory framework, had a model where $F=8.033$,$p=0.006<0.05$ implying positive and significant at 5% level. Findings of study indicated that financial innovation influenced financial performance while bank regulatory framework moderated relationship between financial innovation and financial performance. Commercial banks should implore financial innovations by including budgets specifically for transaction bank cards, agency banking, mobile banking, internet banking and electronic payment so as to increase financial performance.

KEYWORDS - *Commercial Bank, Financial Innovation, Financial Performance, Kenya, Tier 3*

I. INTRODUCTION

Banks play very important role in the economic development of nations as they largely wield control over the supply of money in circulation and are the main stimuli of economic progress. Bank performance can be defined as the reflection of the way in which the resources of a bank are used in a form, which enables it to achieve its objectives. Furthermore, the term bank performance means the adoption of a set of indicators, which are indicative of the bank's status, and the extent of its ability to achieve the desired objectives [1].

Financial performance for Tier 3 Commercial Banks in Kenya has long been of interest to political leaders, current and potential funders, and the communities that they serve. However, these banks face a myriad of challenges in establishing and maintaining financial performance. In the study of the role of commercial banks, noted that as far as the financial performance of the banks itself was concerned, it was evident that most Tier 3 commercial banks and institutions would simply not be able to survive without the support of Central bank of Kenya [2].

According to [3], new technologies, economic uncertainties, fierce competition and more demanding customers have brought about unprecedented set of challenges. Prudent commercial banks in Kenya have to make efforts to survive in a competitive and uncertain market place. Financial innovation as a variable of financial performance is very important factors for organizational success, which can also help Kenya's banks to build long lasting relationships with their customers and increase their performance through the right management systems. However, since the variables of financial performance continue to be challenging, it is worth investigating the real framework of variables of financial performance of Tier 3 commercial banks and institutions in Kenya.

Today's more competitive banking environment is causing banking institutions to evaluate carefully the risks and returns involved in serving the needs of the public [4]. Hence given that their functioning area is not limited within same geographical limit of any country, banks have to manage large volume of transactions. The era of globalization modern free market economy introduce a window of banking acidity that has huge impact on any countries trade and overall development. [5] posited that financial sectors in most developing countries are characterized by fragility, volatile interest rates, high-risky investment and operational inefficiencies in their intermediation process the risk that a bank may not meet its obligations.

[6] noted that as the depositors could call their funds at an inconvenient time, causing fire sale of assets. [7] indicated that upon depositors calling their funds back could negatively affecting profitability of the bank. According to [8] Tier 3 commercial banking problems began the year 1986 which led to massive bank failures, that is, about 37 commercial banks as at the year 2000. The failures were attributed to non-performing assets which was due to financial performance. External auditors had come under sharp scrutiny accused of sleeping on the job or colluding with rogue directors to manipulate financial statements to hide weaknesses. This had partly been attributed to the sudden collapse of three banks-Dubai bank, Imperial bank and Chase banks- in the past nine months. [9] made an attempt to identify the key variables of profitability of public sector banks in India.

Studies that are close to variables of bank performance in Kenya include [10], [11] and [12]. These studies were however, designed to focus on each factor of bank financial performance to the exclusion of the other factors while some only focused on listed commercial banks as in the case of [13]. There is no study that has been done on a larger sample of commercial banks hence a gap that needs to be filled in by carrying out the present study.. Given the passage of time and limitations of case studies as far as generalization of results to the population is concerned, there is need for the present study to be conducted. This study aimed at filling this gap by evaluating the effect of financial innovation on financial performance of Tier 3 commercial banks in Kenya. The specific objective was to determine the influence of moderating effect of bank regulatory framework on financial innovation and financial performance of Tier 3 Commercial Banks in Kenya.

II. DATA AND RESEARCH METHODOLOGY

Cross-sectional survey research design was used in this study. This study involved 22 Tier 3 commercial banks in operation as at 31st December 2017. According to [14], an effective sample should possess diversity, representativeness, reliability and accessibility. The total management level staff is presented in table 2.1:

Table 2. 1: Target Population

Management Level	Target Population
Branch Manager	26
Executive Managers	22
Finance Managers	24
Head of ICT	25
Credit Manager	27
Internal Audit & Compliance Manager	23
Operations Manager & Customer Manager	23
Human Resource Manager	22
TOTAL	**192**

Proportionate random sampling method is used to select relevant respondents from various departments of Tier 3 commercial banks. Proportionate sampling was used to allocate the number of sample size to be pick in each Tier 3 commercial bank using simple random technique. Simple random sample was then used to pick the respondents for the study. The unit of analysis was the staff in management level in Tier 3 commercial banks in Kenya in operation as at 31st December 2019. This study employed [15] formulae in obtaining the sample size stated as:

$$n = \frac{\chi^2 * N * \mathrm{P} * (1 - \mathrm{P})}{\{ME^2 * (N-1)\} + \{\chi^2 * \mathrm{P} * (1-\mathrm{P})\}} \quad \text{.....3.1}$$

Where:

n = Sample size required;

χ^2 = The table value of Chi-square for one degree of freedom at the desired confidence level: N is Population size; P is Population proportion and *ME* is Desired Margin of Error.

With the population of 192 at 95 percent confidence level (table value of Chi-square for one degree of freedom being 3.841); assuming a desired margin of error of 5 percent and a 0.50 population proportion which provides maximum sample size;

Therefore, the sample size used was:

$$n = \frac{3.841*192*0.5*(1-0.5)}{\{0.05^2*(192-1)\}+\{3.841*0.5*(1-0.5)\}}$$

= 128.23 ~ 129

Primary sampling unit was a Tier 3 commercial banks while the basic unit was Departmental Heads of all the Tier 3 commercial bank. The bank branches were listed and one branch for each bank picked through simple random sampling. Where the Tier 3 Commercial Bank had more than one branch, proportionate sampling was used in selection to achieve inclusion on the basis of presence.

The semi-structured questionnaire was administered to the staff in management level on financial performance of Tier 3 commercial banks regulated by the Central Bank of Kenya. The researcher conducted a detailed desk study of various literatures including, Central bank of Kenya reports on financial performance, reports from the World Bank and the International Monetary Fund.

The sample size of 129, that is, staff in management level, who completed the questionnaire out of a total of 192 were obtained using proportionate is shown in the Table 2.2.

Table 2. 2: Number of Managers Selected to Respond to the Questionnaires

	Name of Financial Institution	**No. of Mgt Staff**	**No. of Sample to Respond**
1.	Bank of Baroda	7	5
2.	Consolidate Bank Limited	11	7
3.	Credit Bank Limited	9	6
4.	Development Bank of Kenya	9	6
5.	Dubia Islamic Bank	7	5
6.	Fidelity Commercial Bank	9	6
7.	First Community Bank	10	7
8.	Guaranty Trust Bank	6	4
9.	Guardian Bank Ltd	11	7
10.	Gulf African Bank	11	7
11.	Habib Bank A G Zurich	7	5
12.	I & M Bank	13	9
13.	M-Oriental Commercial Bank	6	4
14.	May Fair Bank	7	5
15.	State bank of Mauritius(SBM)	9	6
16.	Paramount Bank Ltd	9	6
17.	Prime Bank Limited	7	5
18.	Sidian Bank Ltd	16	10
19.	Spire Bank Ltd	10	7
20.	Trans National Bank	9	6
21.	United Bank Limited	6	4
22.	Victoria Commercial Bank	7	5
	Total	**192**	**129**

The selected managers from the Tier 3 commercial banks in Kenya were requested to fill the structured questionnaires with the consultation of the respective managements who provided help in order for the researcher to obtain study information. The respondents filled the questionnaire and were picked after three days. This ensured that all the questionnaires were returned. This study collected primary data which was gathered and generated for the project at hand directly from respondents mainly using questionnaires. The semi-structured questionnaire was administered to the key decision makers on financial performance of Tier 3 commercial banks regulated by the Central Bank of Kenya. The researcher conducted a detailed desk study of various literatures including, Central bank of Kenya reports on financial performance, reports from the World Bank and the International Monetary Fund. The questionnaire consisted of three main sections.

Secondary data was obtained from literature sources through review of published literature such as journals, articles, published theses and text books. These sources were reviewed to give insight in the search for the primary information. Secondary data was also be collected from the various CBK Bank Supervision Annual Reports to calculate the ROA for the period 2013-2019 to represent financial performance. For financial risk, the measures for financial risk management included total capital to risk weighted assets, current ratio, cash to deposit ratio and non-performing loans. Similarly, for regulatory framework, secondary data was collected from the financial statements of the banks and books to collect information on annual earnings of the banks, profits

and loss accounts and balance sheets of specialist banks registered under Central Bank of Kenya. The key variables included Return on Assets, Liquidity, Man-efficiency, and capital requirement. To evaluate the influence of internal controls on financial performance of Tier 3 commercial banks and institutions in Kenya. Secondary data was obtained from the following sources; Data on borrowing interest rates trends and monthly averages from the individual Tier 3 Commercial Banks Annual financial statements and banking supervision reports on Tier 3 Commercial Banks under consideration was obtained from the Central Bank of Kenya Website and Tier 3 Commercial Banks in operation as at 31st December 2019.

Prior to carrying out the main study, pilot study was done. [16] noted that a pilot test is conducted to detect weakness in design and instrumentation and to provide proxy data for selection of a probability sample. Before data was collected, the study first conducted a pilot test on the research tools where data for testing were collected from 10% of the sample size, that is, 10% of 129 managers. This was in line with [17] who asserted that, a sample of 10% was adequate for pilot testing purposes. The pilot sample was therefore 13 managers from Tier 2 commercial banks. The respondents were given two days to respond. These results were not included in the study since these were from another tier.

Validity was carried out with the aim of indicating how accurate the data obtained in the study represent the variables of the study. Factor analysis was used to check validity of the constructs. Factor analysis is used to find factors among observed variables to produce a small number of factors from a large number of variables which is capable of explaining the observed variance in the larger number of variables [18]. Prior to extraction of the factors, several tests were used to assess the suitability of the respondent data for factor analysis.

Historically, the following labels are given to values of [19] as depicted in table 2.3.

Table 2. 3: Labels of Kaiser-Meyer-Olkin

Value of KMO	Interpretation
0.00-0.49	Unacceptable- Sample size not accepted
0.50-0.59	Miserable- Sample size barely accepted
0.60-0.69	Mediocre-Sample size is average and accepted
0.70-0.79	Middling- Sample size is adequate
0.80-0.89	Meritorious- Sample size is commendable
0.90-1.00	Marvellous- Sample size is superb

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy provides an index between 0 and 1 of the proportion of variance among the variables that might be common variance (Cochran, 1963). Where KMO values are small, that less than 0.5, indicate that there is too little in common to warrant econometric analysis. Bartlett's Test of Sphericity relates to the significance of the study and thereby shows the validity and suitability of the responses collected to the problem being addressed through the study. For Factor Analysis to be recommended suitable, the Bartlett's Test of Sphericity must be less than 0.05.

III. RESULTS AND DISCUSSIONS

Regression model was adopted in the study to establish the statistical relationship between the independent and the dependent variables. Kaiser-Meyer-Olkin (KMO) test was used to assess the adequacy of the samples. The test for sampling for this study was carried out and presented in Table 3.1.

Table 3. 1: KMO and Bartlett's Test

Variable	KMO	Bartlett's Test	Df.	Sig.
Financial Innovation	0.616	509.060	231	0.000
Bank Regulatory Framework	0.599	264.723	120	0.000

The Kaiser-Meyer-Olkin Measures of Sampling Adequacy showed the value of test statistic for financial innovation, loan portfolio, internal control, financial risk and bank regulatory framework were 0.616 and 0.599 respectively, which were greater than 0.5 hence an acceptable index. While Bartlett's Test of Sphericity showed that the test statistic value for each of the variables was 0.000 which was less than 0.05 indicating that index was acceptable. These results indicated that the sample adequacy for the variables was adequate to be utilized in the analysis.

Reliability test was carried out and the results is presented in Table 3.2.

Table 3. 2: Reliability Results

Variable	**No. of Items**	**Coefficient Alpha**	**Comments**
Financial Innovation	22	0.920	Reliable
Bank Regulatory Framework	16	0.872	Reliable

Cronbach's alpha was used to determine the reliability of the questionnaire used in this study. In their study, the results showed that Cronbach alpha values ranges between 0 and 1.0; while 1.0 indicated perfect reliability. The findings indicated that innovation had a coefficient of 0.920 and bank regulatory framework had a coefficient of

0.872. All variables depicted that the value of Cronbach's Alpha are above value of 0.700 hence the study was reliable [20]. This represented high level of reliability and on this basis it was supposed that scales used in this study was reliable to capture the variables. [21] explained that reliability could be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy).

Kolmogorov-Smirnov (K-S) test was used to test normality. The results are presented in Table 3.3 for all variables with the distribution of the variables of the study with reference to K-S test.

Table 3. 3: Tests of Normality

Variable	**Statistic**
Financial Performance	0.183
Financial Innovation	0.107
Bank Regulatory Framework	0.118

The findings showed that the variables had significance values higher than 0.05 thus implying that they were normally distributed. Sekaran (2013) observed that a multiple linear regression model was devoid of statistically significant normality problems when it returned Kolmogorov-Smirnov statistics that are greater than the significance level. In this study, the confidence interval was 95% indicating a significance level of 0.05. The findings provide a Kolmogorov-Smirnov value of 0.183 for financial performance, 0.107 for financial innovation and 0.118 for bank regulatory framework.

The findings of heteroskedasticity test based on the Breuch-Pagan Lagrange Multiplier (LM) is presented in Table 3.4.

Table 3. 4: Heteroskedasticty Test Results

Breuch-Pagan LM	Statistic	2.005
	Df	98
	Sig.	0.085

[22] intimated that the error term is homoscedastic if the Breuch-Pagan LM has a significant value greater than the standard model level of significance. In this study, the Breuch-Pagan LM was 2.005 with a significance level of 0.085. Since the significance value was greater than 0.05, the null hypothesis that there was no significant level of heteroscedasticity was rejected with the conclusion that the error term was homoscedastic. This implied that the findings met the homoscedasticity criteria.

This study used [23] test to check that the residuals of the models were not auto correlated since independence of the residuals is one of the basic hypotheses of regression analysis. The results of D-W test in table 3.5 showed the relationship between an error and its immediately previous value.

Table 3. 5: Serial Correlation Test

Model	Durbin Watson
Multiple Regression	1.735

* Predictors: (Constant), Financial Innovation, Loan Portfolio. Internal Control, Financial Risk, Bank Regulatory Framework

** Dependent Variable: Financial Performance

The results indicated that DW statistics was 1.735 which was close to the prescribed value of 2.0 for residual independence. This implied that data had no autocorrelation.

In this study, collinearity was tested using the Tolerance and Variance Inflation Factor (VIF). These variables were subjected to the multicollinearity test and the result is presented in Table 3.6.

Table 3. 6: Multicollinearity Test Results

Variable	**Collinearity**	**Statidtics**
	VIF	Tolerance
Fianncial Innovation	1.119	0.894
Bank Regulaory Framework	1.059	0.944

Multicollinearity in the study was tested using Variance Inflation Factor (VIF). A VIF of more than 10 (VIF ≥ 10) indicated a problem of multicollinearity. According to Montgomery (2001) the cut off thresholds of 10 and above indicated the existence of multicollinearity while tolerance statistic values below 0.1 indicated a serious problem while those below 0.2 indicated a potential problem. The results showed that Variance Inflation Factor of financial innovation, loan portfolio, internal control, financial risk and bank regulatory framework 1.119 and 1.059 respectively. The tolerance levels for financial innovation and bank regulatory framework 0.894 and 0.944 respectively. The results in table 4.30 indicated that the VIF value for financial innovation and bank

regulatory framework had values below 10 with tolerance values above 0.1. Based on these results, the assumption of no multicollinearity between predictor variables was therefore not rejected.

The study sought to establish the association among the study variables. The results are as presented in Table 3.7.

Table 3.7: Correlation Matrix

	FinPerf	FinInnov	BankRF
FinPerf	1		
FinInnov	0.365*	1	
BankRF	0.081	-0.007	1

- Indicates significant at 5% level.

The results in Table 3.7 showed that financial innovation (FinInnov) and internal control were significant and positively associated with financial performance (FinPerf) while financial risk was significant and negatively associated with financial performance (FinPerf). The results further indicated that Loan Portfolio (LoanPort) and Internal Control (InterContr) were significant with a positive association with financial innovation (FinInnov).

A bivariate analysis of the effect of financial innovation on financing performance of Tier 3 commercial banks in Kenya was carried out. To determine bank regulatory framework as a moderating effect of financial innovation and financial performance of Tier 3 commercial banks in Kenya, three models were fitted hierarchically with as depicted in table 3.7.

1. Model 1 having X_1 as the predictor.
2. Model 2 having X_1 and the moderation variable as a predictor.
3. Model 3 is model 2 with interaction term between X_1 and the moderating variable.

Table 3.8: Moderating Effect of Bank Regulatory Framework on Financial Innovation and Financial Performance

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	R Square Change	F Change	Sig. F Change
1	0.365[b]	0.133	0.125	2002.03	0.133	14.942	0.000
2	0.408[c]	0.167	0.149	1973.53	0.167	9.600	0.000
3	0.481[d]	0.232	0.207	1904.98	0.065	8.033	0.006

ANOVA[a]

Model		Sum of Squares	Df	F	Sig.
1	Regression	59890580	1	14.942	0.000[b]
	Residual	388790555	97		
	Total	448681136	98		
2	Regression	74777642	2	9.600	0.000[c]
	Residual	373903494	96		
	Total	448681136	98		
3	Regression	103930761	3	9.546	0.000[d]
	Residual	344750374	95		
	Total	448681136	98		

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		Beta	Std. Error	Beta	t	Sig.
1	(Constant)	-5381.2	1586.7		-3.392	0.001

	FinInnov	2145.08	554.93	0.365	3.866	0.000
2	(Constant)	-7320.61	1852.1		-3.953	0.000
	FinInnov	2152.64	547.0	0.367	3.935	0.000
	Bank RegFrame	770.69	394.2	0.182	1.955	0.053
3	(Constant)	-6874.899	1794.7		-3.831	0.000
	FinInnov.	2145.083	0.053	0.365	3.866	0.000
	Bank RegFrame	747.230	380.6	0.177	1.963	0.053
	FiInnov*BankRegFrame.	2995.949	1057.0	0.256	2.834	0.006

a. **Dependent Variable**: Financial Performance
b. **Predictors:** (Constant), FinInnov
c. **Predictors: (**Constant), FinInnov, BankRegFrame
d. **Predictors:** (Constant)), FinInnov*BankRegFrame

Model 1 showed a positive linear relationship between financial innovation and financial performance (R = 0.365, R^2 = 0.133). The R^2 explained the variations in the dependent variable that could be explained by financial innovation. R^2 of 0.133 indicated that 13.3% of the variations in financial performance could be attributed to financial innovation, while the remaining, 66.7% could be attributed to other factors not included in the model. The model was significant (F change = 14.942, p=0.000). The coefficient of financial innovation was 2145.08, which was positive and statistically significant, p=0.000, at 5 percent level, which implied that for every unit increase in financial innovation, profits increased by kshs2,145.08 in Tier 3 commercial banks in Kenya.

Model 2 showed that when moderator, bank regulatory framework was added as a predictor to the model containing financial innovation, the model was significant (F change = 9.600, p=0.000).

Model 3 showed that when the interaction term (financial innovation*bank regulatory framework) was introduced, the model was significant (F change = 8.033, p-value = 0.006). This meant that the moderator, bank regulatory framework, was statistically significant moderator of the relationship between financial innovation and financial performance of Tier 3 commercial banks in Kenya.

Applying Regression Analysis, the stated hypotheses was that there is no significant influence of moderating effect of bank regulatory framework on financial innovation and financial performance of Tier 3 Commercial Banks in Kenya. The observed test statistic, (F change = 8.033, p = 0.006), for the model when the interaction term (financial innovation*bank regulatory framework) was introduced, indicating the model was significant. This meant that the moderator, bank regulatory framework, was statistically significant moderator of the relationship between financial innovation and financial performance of Tier 3 commercial banks in Kenya at 5 percent level.

Therefore, the null hypothesis indicating that bank regulatory framework does not statistically moderated the relationship between financial innovation and financial performance of Tier 3 commercial banks in Kenya was rejected at 5 percent level of significance.

IV. CONCLUSION

The results obtained indicated that financial innovation plays a critical role in enhancing financial performance financial performance of Tier 3 commercial banks in Kenya. This therefore meant that Tier 3 commercial banks should continue to be in progress with new innovations in order to maintain and improve their financial performance. Such innovations to include transaction bank cards, agency banking, mobile banking, internet banking and electronic payment. This study did not include other factors influencing financial performance of Tier 3 Commercial banks in Kenya. Therefore other studies could be conducted with the addition of factors not included in this study such resource availability, firm size and external factors like macroeconomic volatility that can also influence financial performance of Tier 3 commercial banks in Kenya. This study brought forth that for Tier 3 commercial banks in Kenya to be competitive and improve on their financial performance, financial innovation is a key factor to consider and implement.

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