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RELATIONSHIP BETWEEN FINANCIAL INNOVATION AND COMMERCIAL BANK PERFORMANCE IN KENYA

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Abstract

The need for innovation is precipitated by transaction and operational costs; this can be attained through use of branchless banking system through technological adoption. The current study sought to determine the contribution of mobile, internet, ATM, credit cards, and agency banking. The study was guided by Schumpeter and resources based theory. Using correlation research design, the examined the causal effect of innovation on commercial banks performance in 2012 to 2015. The target population of this study was all the 41 commercial banks in Kenya. Purposive sampling was used to select 11 commercial banks which are listed and actively trading in NSE. Secondary data which was collected from the published annual reports for commercial banks spanning four years (2012-2015). The data was analyzed through the use of STATA version 12. Descriptive statistics showed the average commercial banks performance was 23.7%. Correlation analysis showed that ATM banking had the highest influence on commercial bank performance and more ATM and banking services should more availed through use of it. Regression analysis showed that ATM, mobile banking, use of credit and debit cards, internet banking and agency banking all have positive significant influence on commercial banks performance in Kenya.

Keywords: *Agency Banking, Commercial Bank, Financial Innovation, Online Banking*

1. Introduction

According to European Commercial Bank (ECB, 2003), financial innovation is primarily a product and organizational innovation which allows cost reduction for banks and/or a service improvement for the industry as a whole. Financial innovations have been used by banks as formidable strategic variables to outstrip any form of competition thus becoming an effective means by which banks can improve their performance while simultaneously being able to maintain their effectiveness in the market (Lazo & Woldesenbet, 2006).

The success of agency network of the mobile money providers stimulated some reforms in the banking sector to provide commercial banks with an avenue to promote financial inclusion. In mid-2010, the CBK unveiled amendments to the Banking Act through Finance Bill 2009 to allow agency banking in Kenya. The guidelines allowed banks to use third parties (agents) to provide certain banking services on their behalf in a cost effective way. The agents are already established businesses offering the banking services over and above their normal business. The services offered by agents include: cash deposits, cash withdrawals, payment of bills, account balance enquiry and collection of account opening application forms.

Aduda and Kingoo (2012) sought to establish the relationship between electronic banking and financial performance among commercial banks in Kenya. The research findings established that a positive relationship existed between e-banking and bank performance. The study sought to establish whether the dependent variable which was business performance measured by returns on assets and the independent variables: investment in e-banking, number of ATMs and number of debit cards issued to customers as substitute for e-banking. The researchers ascertain that electronic banking has made banking transaction easier by bringing services closer to its customers thereby resulting to an improvement in bank performance.

In Ghana over time, technology has elevated in importance in the banking sector and has transformed the manner in which banks are able to serve their customers more efficiently while at the same time being able to increase profits and be more competitive with the most revolutionary electronic innovation in the country and the world at large being the ATM (Joshua, 2010).

Commercial banks in Kenya are licensed, supervised and regulated by the Central Bank of Kenya (CBK) as mandated under the Banking Act (Cap 488) and the Central

Bank of Kenya Act. The CBK is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system. According to CBK Supervision Report, there are 43 commercial banks and 1 mortgage finance institution. Out of the 43 commercial banks in Kenya 30 of them are domestically owned and 13 are foreign owned. In terms of asset holding, foreign banks account for about 35% of the banking assets. The locally owned financial institutions comprise 3 banks with significant shareholding by the Government and State Corporations and 27 commercial banks whose greater shareholding is by the public(Central Bank of Kenya, 2015).

The banking industry has been earmarked as a key pillar to the achievement of vision 2030 through encouragement of Foreign Direct Investment (FDI), increased savings, safeguarding the economy from external shocks as well as propelling Kenya to attain the goal of becoming the leading financial powerhouse in Eastern and Southern Africa. Within the Medium Term Plan (2008-2012) under vision 2030, some of the target areas include development of safe and reliable payment systems that will ensure smooth transfer and settlement of funds between customers and banks as well as between banks. Towards this end, the use of mobile phone networks, internet, payment cards, operational resilience and security will be pursued in order to increase trust, integrity and confidence in the ICT based payment systems (Government of Kenya, 2008).

The banking sector of Kenya is governed by multiple rules such as the Banking Act, Central Bank Act, Companies Act and various prudential guidelines and policies issued by the Central Bank of Kenya (CBK) (CBK, 2009).Reforms in the banking sector started in 1994 with the failure of several banks in Kenya, in 1995 the financial sector in Kenya was liberalized with exchange controls and other controls lifted (Nyathira, 2012)..

2. Statement of the Problem

The present study has been necessitated by the current challenges in the banking sector. With the closure of Imperial Bank it has become evident that there are serious challenges in the banking sector and the CBK ought to take measures to cushion bank clients from future losses. This without doubt causes skeptism among bank depositors. It is with this in mind that the current study will undertake to identify some of the financial innovation strategies that can be adopted by commercial banks with the aim of sustaining client satisfaction, increase their customer base and most importantly increase profit. Therefore the present study will attempt to understand the impact of financial innovation and will seek to answer the question: What is the relationship between financial innovation and commercial bank performance in Kenya?

3. Objectives of the Study

The general objective of the study was to establish the relationship between financial innovation and commercial bank performance. Specifically the study sought to:

i. To establish the relationship between ATM adoption and commercial banks performance in Kenya.
ii. To determine the relationship between customers enrolled in credit and debit cards and commercial banks performance in Kenya.
iii. To find out the relationship between mobile banking and commercial banks performance.
iv. To establish the relationship between internet banking and commercial banks performance in Kenya.
v. To determine the relationship between agency banking and commercial banks performance in Kenya.

4. Literature Review

The study was guided by two theories;

Schumpeter Theory of Innovation- Schumpeter (1928) argued that entrepreneurs who could be independent engineers or R&D engineers in large corporations created the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation.

Resources Based Theory The resource based view is concerned with the influence of firm's capabilities and resources in explaining why firms differ and how they sustain and achieve competitive advantage (Barney, 1991).A central premise of resource based view(RBV) is that firms compete on the basis of their resources and capabilities (Peteraf &Bergen,2003) .The RBV focused more on internal strategies to demonstrate how firms attempt to outdo each other in a competitive environment. The premise of RBV is that the heterogeneity and imperfect mobility of resources amongst firms explain why some firms can provide superior customer value and/or achieve relative lower costs, leading to dominant market share and superior financial performance (Vijande *et al.*, 2012).

Conceptual Framework

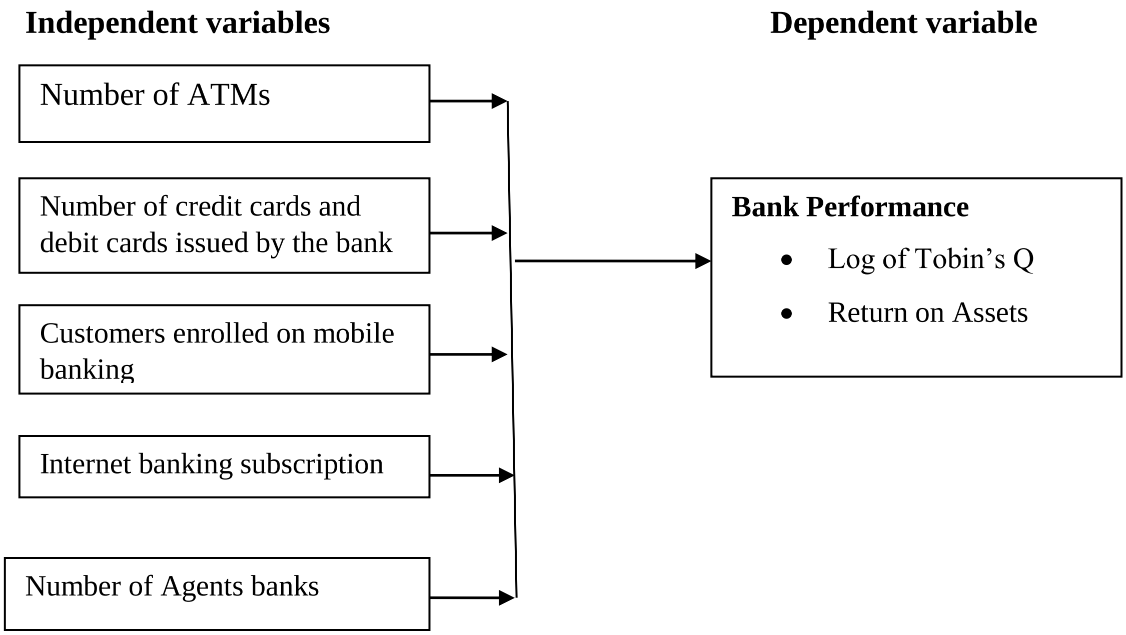

Figure 1 Conceptual Framework

5. Research Methodology

The study adopted a correlation research design. The target population for the study was 42 commercial banks listed in Kenya by the CBK as at 2015. Purposive sampling procedure was used to select commercial banks that were listed and actively trading in Nairobi Securities Exchange. This study utilized secondary data for six years among 11 listed commercial banks in 2010 to 2015 in NSE. Microsoft Excel and STATA statistical packages were used to analyze the data

RESULTS AND DISCUSSION

6. Descriptive Analysis

Descriptive analysis such as mean, standard deviation, minimum and maximum was used to summarize the data. On average the return on equity was 23.7%, with an average deviation of 9%. On average agency banking was the most attractive commercial banking innovation adopted with the past six years by commercial banks in Kenya, this can be attributed by its accessibility among Kenyan since it's located within their residence. This is a good progress towards financial depending; which is aimed at increasing the level of banking in Kenya and consequently decrease the level of poverty since more Kenyan will be empowered and can access loan facilities.

Moreover, the mobile banking has dominated and commercial banks ought to intensify on financial products which can integrate use of mobile phones on access of banking services. More so commercial banks ought to merge or invest in companies which will minimize the transaction costs and consequently minimize the level of information asymmetry between users of banking services and service providers. The use of internet banking is also on positive progress especially with increased internet access even in rural areas. There is need for commercial banks to sensitize the public on the use of internet banking and encourage them to use despite the risk issues posed with use of information technology. The use of plastic money through credit and debit cards among Kenyan should be encouraged though the study results shows positive intake of credit and debit cards.

Table 1 Panel Descriptive Analysis

Variable		**Mean**	**Std. Dev.**	**Min**	**Max**
ROE	overall	0.237	0.090	0.220	0.380
	between		0.053	0.018	0.266
	within		0.074	0.208	0.333
ATM Adoption	overall	10.3	6.3	7	33.3
	between		4.8	4.9	20.2
	within		4.4	3	28.5
Credit and debit cards	overall	57.1	25	30	93.5
	between		19.2	32.8	93.5
	within		17	9.4	90.9
Mobile banking	overall	108.9	34.3	8	15.9
	between		35.6	30.3	15.2
	within		5.2	86.6	128.6
Internet banking	overall	62.5	35	41	113.6
	between		29.2	32.5	114.5
	within		18	6.4	80.9
Agency banking	overall	118.9	44.3	8	17.9
	between		45.6	30.4	152.8
	within		35.6	48.6	118.2

7. Correlation Analysis

Correlation analysis was carried out to examine both the strength of the relationship between variables as well as multicollinearity between independent variables. Results in table 2 showed that there was a positive and significant relationship between return on equity and adoption of automatic tell machines by commercial banks in Kenya (rho = 0.875, p value <0.05). This implies that a unit change in use of commercial banks increases profitability by 87.5%. These were findings were consistent with Njoki and Oloko (2005) who found a positive and significant relationship between return on assets and cost incurred on ATM adoption among commercial banks in Kenya.

There was a positive and significant relationship between use of debit and credit cards and commercial banks performance in Kenya (rho = 0.749, p value < 0.05). This implies that a unit change use of debit and credit cards increases commercial banks performance by 74.9%. These results were in support of (Monyoncho, 2015) who argued that commercial banks adoption in use of credit and debit cards improves banks efficiency which minimizes the transaction costs and consequently increases return on equity.

There was a positive and significant relationship between return on equity and use of mobile banking (rho = 0.649, p value < 0.05). This implies that a unit change in use of mobile banking services increases commercial banks performance by 64.9%. These results were in tandem with (Mutua, 2012) who argued found that the use of mobile banking increased the amount of deposits and borrowing in Kenyan commercial banks this had a long term increase on profitability.

Fourthly, the use of internet banking significantly influenced commercial banks performance in Kenya (rho = 0.569, p value <0.05). This implies that a unit increase in internet banking uptake increased profitability in Kenyan commercial banks by 56.9%. There results were in agreement with (Ngumi, 2013) who found that adoption and usage of internet banking increases the profit prospects of Kenyan banks through deposits mobilizations and increased and shorter period on loan approval.

Finally, the influx of agency banking had a positive significant influence on commercial banks performance (rho = 0.658, p value <0.05). This implies that a unit increase in agency banking increases commercial banks performance by 65.8%. These results were in agreement with (Kingori & Gekara, 2015), who found that the introduction of agency banking in the Kenyan banking system increased commercial banks performance. A close check of the collinearity between variables indicates that none of the independent was highly correlated with the others since none of them had a correlation coefficient greater than 0.7.

Table 2 Correlation Analysis

	ROE	ATM	Cards	Mobile	Internet	Agency
ROE	1					
ATM	0.875***	1				
	0.000					
Cards	0.749***	0.366*	1			
	0.000	0.071				
Mobile	0.640***	.411	0.014	1		
	0.000	0.085	0.052			
Internet	0.569***	.541	0.054	.431	1	
	0.000	0.950	0.785	0.056		
Agency	0.658***	.383	0.521	.378	.013	1
	0.000	0.0895	0.03	0.061	0.068	

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

8. Diagnostic Analysis

In the current section the study reports panel data diagnostics tests which include serial correlation, heteroskedasticity and time fixed effects tests were carried out. Breusch Pagan LM test was used to test the appropriate model between pooled effects regression and random effects regression model. Since the P value was less than 0.05, there was significant difference on commercial banks performance listed in Kenya thus pooled effects regression modeling was not appropriate for the study.

Table 3 Chi-Square Values For The Breusch-Pagan LM Test

Model	Dependent variable	χ^2-value	p-value
1	ROE	21.87	.0000

Results in Table 4 shows the test results for time fixed effects. The findings showed no significant time effects thus, there was need to introduce dummy variables or run a two way analysis. Since there are random effects two way analysis was carried out.

Table 4 Test Results for Time Fixed Effects

Model	Dependent variable	F- value	p-value
1	ROE	5.23	0.0001

Heteroskedasticity former was tested using modified Wald test while serial correlation was tested using Wooldridge Drukker test. Results in Table 5 revealed that there was no heteroskedasticity. In addition, there was no evidence for serial correlation among the panels since the (p value > 0.05).

Table 5 Result for Heteroskedasticity and Serial Correlation Tests

Model	Test for heteroskedasticity Dependent variable	χ^2-value	p-value	Serial Correlation F-value	p-value
1	ROE	0.09	0.6654	1.442	0.513

9.

10. Panel Data Analysis

The secondary data collected had both cross sectional and time series characteristics, Breusch Pagan LM test showed pooled effects model was not appropriate for the study. Due to this the most appropriate model for the study was panel regression model which could either be random effects (RE) or fixed effects (FE). FE regression modeling is more appropriate when the study seeks to examine the effect of independent variables over time. More so the independent entity should be having a relationship with the independent variables. In contrast RE assumes that independent variables have no collinearity with independent entities. In addition, it assumes that there are random variations across the error terms and both independent variables and specific's entities are too treated as independent variables. To make a choice between random and fixed effects panel regression model, Hausman test was applied, as shown in Table 6. Since the p value was greater than 0.05, the most appropriate model to explain the relationship between commercial banks innovation and innovation was random effects regression modeling.

Table 6 Hausman Test Results

Variable	Fixed	Random	Variable (Diff.)	Prob.
ATM	0.045	0.051	0.001	0.829
Cards	0.080	0.084	0.000	0.435
Mobile	0.078	0.079	0.000	0.717
Internet	0.095	0.093	0.000	0.235

Agency	0.035	0.036	0.000	0.326
Chi square =0.987 P value = 0.9296				

Results in table 7 shows that 68% of the variations on ROE in commercial banks were influenced by ATM, debit and credit cards, mobile banking, internet banking and adoption of agency banking. Moreover, all the independent variables had a joint significance influence, (F statistics = 15.6119, P value <0.05). This implies that at least one of the independent variables is a not a zero.

The first research question of the study sought to establish the influence of ATM adoption in commercial banks performance in Kenya. Results of the study showed that there was a positive and significant relationship between adoption of ATM and commercial banks performance in Kenya. The slope coefficient indicated that a unit change in use of ATM increased commercial banks performance by 0.051 ($\beta = 0.051$, p value <0.05). These results were in agreement with (Itah & Ene, 2014; Sowunmi et al., 2014), whose studies found that the cashless banking systems increased commercial banks return. In the later primary data was used to show the impact of ATM adoption on commercial banks while the former used secondary data to show the effect of cashless system in Nigerian perspective.

The second research question sought to examine the effect of credit and debit cards on commercial banks performance. Results of the study showed that there is a positive and significant relationship between use of credit and debit cards and commercial banks performance and a unit change in use of credit and debit cards increased commercial banks performance by 0.084 ($\beta = 0.084$, p value <0.05). These results supported the (Sajid et al., 2014; Maiyo, 2013) whose studies found that the adoption of e-banking in developing countries increased commercial banking efficiency which ultimately increased the profitability levels in each commercial bank.

The third research question sought to find out the whether the use of mobile banking influences commercial banks performance. Results of the study revealed a positive and significant relationship between commercial banks performance and use of mobile banking ($\beta = 0.079$, p value <0.05). This implies that a unit change in the use of mobile banking increases commercial banks performance by 0.079. The results of the study were in agreement with (Ambrose & Bonface; 2015; Kihara, 2015) whose results from primary data revealed that adoption of mobile banking had a positive and significant influence of Kenyan commercial banks performance.

The fourth research question sought to examine on the influence of internet banking on commercial banking performance in Kenya. Results of the study revealed that there was a positive and significant relationship between internet banking and commercial banks performance ($\beta = 0.093$, p value <0.05). This implies that a unit change in internet banking increases commercial banks performance by 0.093.

Finally, the fifth research question sought to establish the influence of agency banking on commercial banks performance. Results of the study revealed that agency banking influenced listed commercial banks positively ($\beta = 0.036$, p value <0.05). This implies that a unit change in agency banking increases commercial banks performance by 0.036. These results are in agreement with (Ngari & Muiruri, 2014; Kingori & Gekara, 2015) whose study found a positive and significant relationship between adoption of agency banking and commercial banks performance.

Table 7 Random Effects Regression Model on Treasury Funding

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.357	0.323	1.105	0.235
ATM	0.051	0.013	4.051	0.000
Cards	0.084	0.023	3.674	0.000
Mobile	0.079	0.024	3.242	0.000
Internet	0.093	0.042	2.221	0.000
Agency	0.036	0.011	3.15	0.000
Effects Specification				
			S.D.	**Rho**
Period random			0.045	0.256
Idiosyncratic random			0.077	0.744
Weighted Statistics				
R-squared	0.6781	Mean dependent variable		0.2370
Adjusted R-squared	0.6521	S.D. dependent variable		0.09
S.E. of regression	0.0736	Sum squared resid		0.6281
F-statistic	15.6119	Durbin-Watson stat		2.4848
Prob(F-statistic)	0.0004			
Unweighted Statistics				
R-squared	0.6800	Mean dependent variable		0.237
Sum squared resid	0.7988	Durbin-Watson stat		2.500

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

11. Summary of the Findings

The current study stemmed from the realization of the research problem in literature role of financial innovation and the past empirical findings. Empirically most of the studies on the effects innovation have been skewed towards the use of primary data and individual aspect of banking innovation has been evaluated. Among the several studies which had been done in the Kenyan perspective majority have not used panel data analysis approach thus the appropriate choice of model to examine the relationship between innovation and commercial banks performance have not been considered. Consequently, the researcher's primary purpose was to examine the relationship between innovation and commercial banks performance panel evidence from Kenya. Further, the researcher aimed at answering three research questions which were: How does ATM adoption influence commercial banks performance in Kenya? What is the relationship between credit and debit cards customers enrollment and commercial banks performance? Does mobile banking influence commercial banks performance in Kenya? Does internet banking influence commercial banks performance in Kenya? What is the influence of agency banking on commercial banks performance in Kenya?

In order to meet the overall objective and thus answer the research questions of the study the researcher adopted correlation research design. Purposive sampling technique was used to select a sample of 11 commercial banks which has been listed in NSE in 2012 to 2015. The choice of the period was attributed to promulgation of Kenyan new constitution since there was much anticipation of changes in the business environment. Secondary data was collected from annual audited financial statements of listed commercial banks. The independent variables constituted use of ATM, credit and debit cards, mobile banking, internet banking and agency banking while the dependent variables was the annual return on equity. Log transformation was applied on all independent variables. The data was cleaned and subjected to analysis and presented inform of tables. Prior to panel data analysis diagnostic tests were carried out which revealed that the data had panel pattern and the most appropriate model was random effects regression analysis.

Regarding the first research question, both regression and correlation analysis revealed that there was a positive and significant relationship between adoption of ATM and commercial banks performance in Kenya.

These results were in support of resources based theory therefore commercial banks should automate their operations through the use of ATM which would decrease operational costs and increase the profit levels. More so the adoption of ATM will reduce the time spent as customers waits to be served by tellers.

Secondly, the findings indicated that there was a positive and significant relationship between use of credit and debit cards and commercial banks performance. These results were consistent with the Schumpeter theory that articulates that innovative measures adopted by various institutions are geared towards reduction of transaction costs. The successful adoption of credit and debit cards among users of commercial banks services has positive trajectory on their returns.

Thirdly, the study observed a positive significant relationship between mobile banking and commercial banks performance in Kenya. These results are in tandem with resources based theory which stipulates that the level of resources endowment increases the prospect of good profit among commercial enterprises.

Fourthly, the study found a positive and significant relationship between internet banking and commercial banks performance in Kenya. Finally, there was a positive relationship between agency banking and commercial banks performance. The duo are in support of Schumpeter theory of innovation and they will ultimately improve customer relationship and minimize operational costs.

12. Conclusion

Based on the study findings the current research inquiry attained the main objective of determining the relationship between innovation and commercial banks performance. Based on the study most of commercial banks have intensified their profitability by developing new products which are incorporated in operations and they have minimized operational costs and increased efficiency and consequently there profitability.

Since there is a positive and significant relationship between mobile banking and commercial banks performance there is need to develop financial products which can be accessed through use of mobile banking and consequently increase the profitability of commercial banks.

There is need for commercial banks to sensitize the public on the use of cashless money owing to ease of their mobility and accessibility. Thirdly, commercial banks improve the ATM system to be in a position to offer all banking services since most of the respondents were comfortable in executing there transactions through use of ATM.

The use of internet banking should be sensitized through use various marketing platforms and members of the public ought to be trained on the use of internet banking which will ultimately foster faster and easier access of commercial banking services. The adoption of agency banks should be intensified among members of the public as such to increase the banked population and consequently increase the level of financial banking among the locals.

13. Recommendation

There is need for research and development teams in commercial banks to develop customized products which are geared at capturing a certain market niche. Regarding the adoption of ATM in the commercial banks the services should be availed in the banked population domiciling in areas where the respective commercial banks do not have ATM services. There is need for more branchless banking services products to be developed owing to their benefits both to the bank and customers.

There is need for customized products attained from both credit and debit cards in Kenya. More so the customers should be in a position to use the plastic money even if the specific provider of goods and services does not have prior contract with the bank providing the services.

Mobile banking services should be customized to allow the client to access all the banking services. More so there is need for commercial banks to seek affordable mobile banking services which would ultimately minimize the transaction costs since the current situation the cost of the services are high since the banks accesses the services from mobile service providing companies.

The concept of agency is the latest innovation of branchless banking which is geared towards improving the access of commercial banking services which improves there profitability. Since the use of agency banking have allowed the rural unbanked population to access services there is need to enable them to access small loan amounts which will empower them.

14. Suggestion for Further Studies

The current study helped to analyze the effect of innovation on commercial banks performance. However, there is need for categorization of commercial banks into their tiers. There is need for a comparative study between listed and none listed commercial banks. Further, there is need to evaluate the qualitative influences of commercial banks innovation. There is need to evaluate the influence of financial performance on county funding since there are two of governance systems in Kenya and each has a contribution to the treasury funding. Since recently there is emergence of microfinance banks there is need for a similar study to be carried out among microfinance banks and all financial institutions which are geared towards taking deposit from members for example savings and credit cooperative societies.

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