INFLUENCE OF FINANCIAL INNOVATIONS ON PERFORMANCE OF COMMERCIAL BANKS IN KENYA

Magdalene Mukiri

School of Business and Economics,

Meru University of Science and Technology, Kenya

P. O. Box 972-60200, Nairobi, Kenya.

Ms. Haldes Nguta

School of Business and Economics,

Meru University of Science and Technology, Kenya

P. O. Box 972-60200, Nairobi, Kenya

Dr. Mohamed Shano

School of Business and Economics,

Meru University of Science and Technology, Kenya

P. O. Box 972-60200, Nairobi, Kenya.

Corresponding Author email: mngalamukiri@gmail.com

CITATION: Mukiri, M., Nguta, H., Shano M. (2017). Influence Of Financial Innovations On Performance Of Commercial Banks In Kenya. *International Journal Of Economics And Finance*. Vol. 6 (12) pp 20 – 38.

ABSTRACT

Banking sector is a very instrumental player towards economic prosperity in Kenya and across the globe. This sector's performance has been largely associated with various financial innovations. Despite financial innovations showing fruitful results in some economies, some empirical findings have suggested that it breeds financial unrest in other economies. This leaves the whole issue of whether financial innovations in Kenya should be endorsed or not a debatable subject. This study sought to examine the effect of financial innovations on bank performance in Kenya. The study relied on panel secondary data collected on 40 commercial banks in Kenya spanning from the year 2012 to 2016. The study findings led to the conclusion that an increase in the number of ATMS leads to an increase in returns on Assets of commercial banks in Kenya. Furthermore, an increase in the transactions made through EFTs leads to an increase in returns on Assets of commercial banks in Kenya. The findings showed that an increase in the number of transactions through agency banking leads to an increase in returns on Assets of commercial banks in Kenya. The study further indicated that an increase in the number of transactions made through mobile phone leads to an increase in returns on Assets of commercial banks in Kenya. Of the investigated financial innovations, the study established that online banking doesn't have a significant effect on financial performance of commercial banks in Kenya. Another finding was that user acceptance has a significant moderating effect on the relationship between financial innovation and financial

performance of commercial banks in Kenya. The study recommends that since financial innovations technologies such as ATMS, EFTs, agency banking and mobile banking affect financial performance positively, there is a need for commercial banks to consider investing more in these technologies so as to enhance their performance in the long run.

Key Words: *ATM, Electronic Funds Transfer, Agency banking, Mobile banking, Online-banking, Financial Performance, Commercial banks*

Introduction

The banking sector form one of the key growth catalysts of most developing economies such as Kenya. The sector majorly performs financial intermediation duties. More so they contribute to investment, job creation and to general economic growth. They also constitute the best channel through which monetary policies instituted by Central banks can be transmitted to ensure economic growth and stability (Sergeant, 2001; Sathye, 2003). Thus their success is paramount to the entire economy's flourishment. As much as the success of banking sector drives economies, the success of this sector also depends largely on the financial innovation. Generally innovation is changing or creating new and more effective products, processes and ideas which can increase the likelihood of a business succeeding by implementing new ideas, creating dynamic products and or improving existing products and services (Tufano, 2002; Lawrence, 2010). In regard to the financial sector, Nofie (2011) defines innovations in the financial sector as the arrival of a new or better product and/or a process that lowers the cost of producing existing financial services. In addition to the great role it plays in financial sector, Lerner (2002) also argues that the need for innovations cuts across all sectors of modern economies across the global.

Many arguments have been advanced in support of financial innovation on the grounds that there exist challenges due to competition from new players joining the market and commoditization of most of the basic retail banking products and services. For example, Avlonitis, Papastathopoulou, and Gounaris (2001), postulated the importance of new products and services in the financial sector. This postulations was empirically proved that among all public offerings in 1987, 18 percent consisted of securities that had not been in existence before, on a dollar weighted basis. Like any other commercial entities, banks have profit maximization as their overriding goal. It is argued that innovation is a key tool to achieve this in addition to gaining a competitive advantage over other players. This is because innovation cuts down transaction and information search costs, improves on products, processes and organizational structure (Roberts & Amit, 2003).

From the global standpoint, there seem to be lack of consensus on whether financial innovation should be endorsed or not. Some empirical results have strongly painted innovation as the mastermind behind great financial crisis experienced especially the mighty financial crisis that struck globally across economies in 2007. One of the main arguments advanced when explaining how innovation leads to crisis is that it catalyzes bank assets to expand at a substantively faster rate than retail deposit, bank loans rise at a substantially

higher rate than bank's risk-weighted asset and thus banks suffer from liquidity problems (Llewellyn, 2009). However some empirical studies indicate mixed results of innovation both as a vice and a virtue to various banks of developed economies. Beck, Chen, Lin, and Song (2014) found out that financial innovation positively drives economic growth in terms of Gross Domestic Product (GDP) and capital growth. On the other hand, innovation results to higher volatility in growth which in turn makes the banking sector fragile and exposed to risks.

The financial sector of modern day Kenya harbors 44 financial institutions out of which 43 are commercial banks and 1 mortgage finance institution licensed and regulated pursuant to the provisions of the Banking Act. It is the responsibility of CBK to formulate and implement monetary and fiscal policies (CBK, 2015). Out of the 40 institutions, 27 are locally owned and 13 foreign owned. The locally owned financial institutions comprise 3 banks with significant shareholding by the government and state corporations, 24 commercial banks and 1 mortgage financial institution (MFC'S) (CBK, 2014; 2015). Financial innovations in Kenya include automation of Nairobi Stock Exchange (NSE), mobile banking, automated teller machine (ATM), Credit Reference Bureaus (CRBs) and agency banking among others (Wafula, 2015; CBK, 2014; 2015).

These innovations are associated with the tremendous changes in the last two decades within the Kenyan financial sector that has led to proliferation of financial products, activities, and organizational forms that have improved and increased the efficiency of the financial system (Muiruri, 2011). The benefits of these innovations have been witnessed on several aspects. For example use of mobile phone financial services in Kenya has helped to increase the customer base for the banks that has adopted it, Agency banking has helped the banks to reach unbanked customers, and the ATM has aided in reducing the cost of banking and increased efficiency. In addition, Islamic bank has helped to accommodate customers from Muslim religion by offering tailor made information products and finally Internet banking services have enabled customers to view their bank statements and balances without having to visit the bank and the also banks can communicate to customers about new products or changes on existing products using the same channel.

Kenya's banking sector has expanded immensely if corresponding statistics for financial years ending June 2012 and that ending June 2016 are compared. Total asset for banking sector was 1548.4 billion by the end of June 2012 and had risen to 3.6 trillion by the end of June 2016. More so within this period; deposit liabilities, capital and reserves as well as pretax profit rose significantly from ksh1219.5 billion to 2.6 trillion, 222.3 billion to 543.3 billion and from Ksh34.9billion to 76.7 billion respectively. On the other hand, within the same period Kenya Electronic Payment Settlement Systems (KEPSS) moved a volume of 673365 transactions (worth Ksh 16,806 billion) for the financial year ending June 2010 while the corresponding statistics for the year ended June 2016 is 2,885,376 transactions (Ksh27,002 billion). Furthermore within these five years, amount transferred through Electronic Fund Transfers (EFT) rose from Ksh 367 billion to Ksh 513 billion while the total number of mobile phone cash transfer transactions expanded from 251.2 million for the year

ended June 2010 to 1,002.25 transactions for that ended June 2016. For the ATM transactions, January to December 2009 recorded dispensing of Ksh 5,078 billion for acquirers and Ksh 417 for issuers while similar transaction for from January through to December 2016 were Ksh 754.02 billion and Ksh 1,292.71 billion respectively (CBK, 2010; 2015). These statistics seem to suggest positive correlation between performance (asset value, capital and reserves, profit and deposit liabilities) and innovation proxies like ATM transactions, EFT among. However whether this relationship is a matter of chance or causality is an empirical question that this study seeks to investigate.

Statement of the problem

The banking sector has been noted to greatly fuel growth and development among economies and thus their success is desirable (Sergeant, 2001; Sathye, 2003). With the success motive, banking sectors and entire financial sectors globally have strived to either innovate or embrace innovations since innovations are believed to positively impact on their performance. Consequently developing nations, Kenya inclusive have remained determined in adopting such innovations due to their perceived importance (DiMasi, Hansen, & Grabowski; 2003). The effect of financial innovations on financial performance of commercial banks is mixed. Llewellyn (2009) blames innovations for breeding financial crisis. Boot & Marinč (2010) reveal both dark and bright side of innovations. In addition, other studies reveal positive contributions of innovations towards bank performance (Simiyu *et al*., 2014; Cherotich *et al*., 2015). These mixed findings leave the issue of whether innovation is desirable or not debatable. Hence there is a dilemma of whether to endorse financial innovations as desirable course of action in the banking sector or not.

Even though Mugambi (2006) attests that much research work has been done on areas of service excellence and customer satisfaction in the banking industry, little has been done on the influence of financial innovation on bank performance. According to Kihumba (2008) and Kamotho (2009) among others, stiff competition and technology are major drivers of financial innovations. However, discussion on how these innovations affect performance of commercial banks was given little attention, creating researchable gap for study.

Research objectives

i. To examine the effect of the number of ATMs on financial performance of commercial banks in Kenya
ii. To determine the effect of Electronic Funds Transfer on financial performance of commercial banks in Kenya.
iii. To examine the effect of banking agency on financial performance of commercial banks in Kenya.
iv. To establish the effect of mobile banking on financial performance of commercial banks in Kenya.
v. To determine the effect of online-banking transactions on financial performance of commercial banks in Kenya.

Literature Review

Theoretical Literature

Circumvention Innovation Theory

This theory was proposed by Kane (1981). The theory postulates that numerous forms of government regulation and controls with characteristics similar although indirectly related to tax negatively affect the activities of the company. These regulations reduce the opportunities of such companies to carry out activities that generate profit. Accordingly, the theory can be perceived as a conflict between independent economic and political units. This theory therefore indirectly articulates that institutions in the financial sector are designed to overcome the challenges towards profit making that are created by the government (Elliot *et al*., 2000). However this theory is not sufficient in its perception of the regulation function of the government in the economy. It fails to realize that government regulations are hardly effective means of liberalizing the economy and making it more competitive among the players so as to promote economic growth and development. Rather, regulations are portrayed in this theory as challenges that frustrate the efforts of financial institutions. The theory is therefore based on an incorrect philosophy.

The theory is relevant to the study as it articulates that institutions in the financial sector are designed to overcome the challenges towards profit making that are created by the government. Some of the challenges can be overcome through financial innovations which this study has been built on.

Constraint-Induced Financial Innovation Theory

This theory was advanced by an American economist Silber (1983). According to this theory, profit maximization among financial entities is the major motivator for innovations in this sector. This theory however exemplifies that in pursuit of profit maximizing agenda by these firms, there are inherent hindrances both from within and without the entities. Such external constraints include policies set by government (for example base rate, asset-cash ratio etc) while the internal may include managerial layout and leadership skills especially among top managements.

Restrains imposed by the external and internal hurdles are what constraint-induced financial innovation theory blames for inefficiencies witnessed in the financial sector. The implication of this theory is that innovation and inventions efforts are purely for eliminating these menaces (Silber, 1983; Obay, 2014). Premised on microeconomics foundations, firms can be modeled as profit maximizers and thus it is arguably justified that innovation should be skewed toward profit maximization. However, perceiving innovation as purely a way of circumventing external policies and internal hindrances is primitive especially in liberalized economies with minimal policies that conflict profit maximizing agenda. In addition not all financial institutions suffer from injurious internal management and leadership issues and yet innovation is still desirable. The profit maximizing concern pointed out by in the theory is a good guiding principal in modeling the behavior of a firm.

The theory is relevant to the study in establishing the motivation behind innovations in a firm. The theory postulates that profit maximization among financial entities is the major motivator for innovations in this sector. The theory directly links performance to innovations and presents a positive relationship between the two variables.

Transaction Cost Innovation Theory

Hicks and Niehans (1983) formulated this theory. In accordance to this theory, financial innovation is mainly driven by the desire to cut down transaction costs. Ideally these innovations are responses to advanced technology which helps to keep transaction costs at low levels.

This model is significant to this study in explaining the link between financial innovations and transaction costs of a firm. This model implies that it is the need for maintaining transaction cost at low levels that necessitates innovation in financial sector. Synonymously, financial innovation is aimed at earning financial benefits to respective financial entities. Therefore, the theory links innovation to financial performance of a firm positively.

Technology acceptance model (TAM)

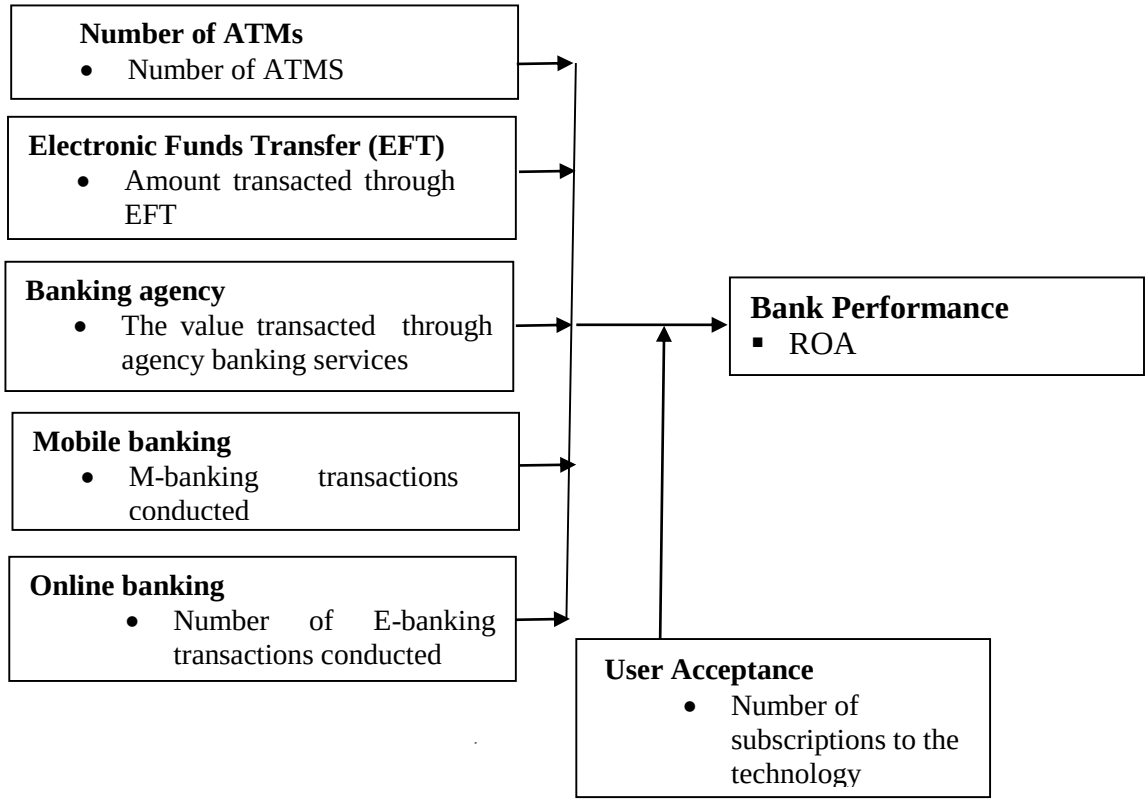
The Technology Acceptance Model, commonly referred to as the technology acceptance model (TAM), was proposed by Davis (1989). This model was proposed to mainly focus on the reason the potential users of the new technologies accept or reject the information technology and how to improve the acceptance, offering, this way, a support to foresee and explain the acceptance. He conducted a survey in a group of 112 users at the Canada IBM and in 40 Master of Business Administration students of Boston University. The validation of the TAM model was based in the acceptance of a software text editor (Davis 1989; Battacherjee, 2000). The TAM has the advantage of being specific to information technology and has a strong theoretical base, besides the wide empiric support, as claims (Davis 1989).

According to the model, the use of the information systems would be determined essentially by the use intention that the individual presents. This, in turn, would be determined together by the individual use attitude in relation to the real use of the system and by perceived usefulness, each one exerting a relative weight. This relation between attitude and intention suggests that people form intentions to perform actions to the ones they have a positive feeling. On the other side the relation between perceived usefulness and use intention, is based on the idea that, inside an organizational context, the people form intentions in relation to behaviors which they believe will increase their performance at work. The authors Davis, Bagozzi, and Warshaw (1989) presuppose that the saved effort, due to the improvement in the perceived usefulness ease may be applied in other tasks, consequently allowing that one person carry out more work with the same effort, this way having a direct effect in the perceived usefulness. Perceived usefulness use has a causal effect in perceived usefulness.

The theory of Acceptance Model (TAM) is important to the study as it is aimed at predicting and explaining what drives potential adopters to accept or reject the use of innovative technology. The theory will direct us in comprehending some of the factors that influence the

use of various ICT components by the commercial banks. Commercial banks use all or some of the following ICT components; mobile banking technologies, electronic money transfers, internet banking transactions, electronic data interchange, ATM deposits and withdrawals, smart cards among others. The theory makes us understand why banks may choose to adopt the various ICT components which may influence the financial performance. For Davis (1989) the people tend to use or not certain technology with the objective to improve performance at work - perceived use. The theory therefore guides us in the study in trying to find out the perceived adoption of various components of ICT and the financial impact that this will have on the commercial banks in Kenya. The theory is thus pertinent to the study in explaining the moderating effect of technology acceptance on financial performance of commercial banks in Kenya that is captured in the moderating variable (user acceptance) in this study.

Conceptual Framework



Independent Variables **Moderating Variable** **Dependent Variable**

Figure 1: Conceptual Framework

Research Methodology

This study adopted a descriptive study design. This study collected secondary data on banks that existed as banks in Kenya for the periods 2012 to 2016. The commercial banks by the end of December 2016 were 40 after the collapse of three commercial banks. The study used a census approach in collecting secondary data from the 40 commercial banks in Kenya by 2016. Since the study relied on secondary data, data collection template was used in guiding the data collection process. This is simply a guide on which data to seek for and from where. The study relied on secondary data collected from 40 banking institutions that existed from 2012 to 2016. Data collection template guided this process. This data was collected from various audited financial sources available to the general public. This took the researcher a period of three weeks. The study used descriptive statistics to establish a relationship between financial innovation and financial performance with the help of SPSS version 21. The data interpretation was made by ratios and also based on correlation and regression. The study applied ordinary least squares (OLS) technique. To determine whether there existed any relationship between the explanatory variables, a multi-multicollinearity test was carried out. The regression model is specified below and the following symbols were used to identify the respective variables.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_{2+} \beta_3 X_{3+} \beta_4 X_{4+} \beta_5 X_{5+} \varepsilon$$

Where; Y = Financial Performance, X_1= Number of ATMs, X_2= EFTs, X_3= Mobile Banking, X_4= Agency Banking, X_5= Online Banking, α = Constant (coefficient of intercept), $\beta_1 - \beta_3$ = Regression coefficients, ε=Error term

FINDINGS

Trend Analysis

The study established the trend analysis of the study variables over the five year period in order to establish the time effect of the data. This helped in establishing the stationarity of the data.

Trend Analysis of Financial Performance of Commercial Banks

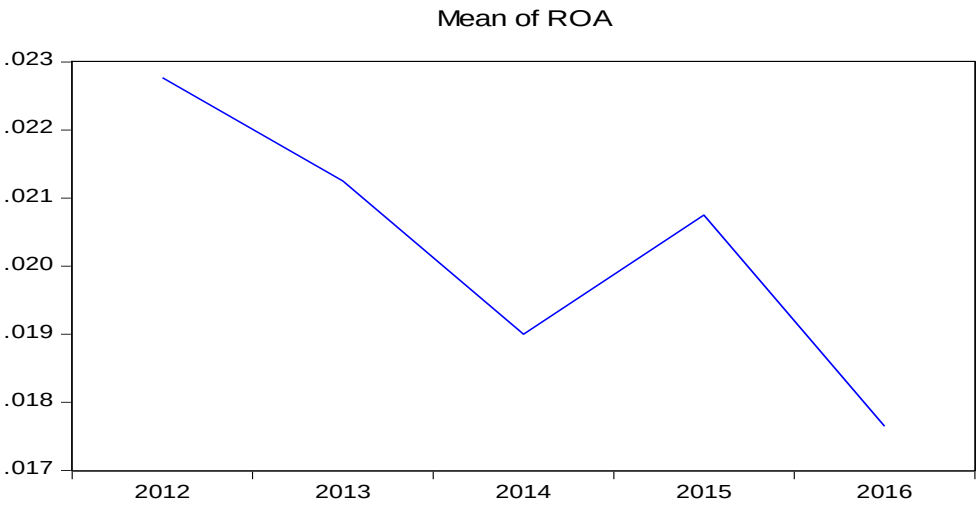


Figure 2: Trend analysis of financial performance

The study established the trends of financial performance with regard to the years under study. The study focused on a five year period from the year 2012 to the year 2016. The findings in Figure 2 revealed that there has been an unsteady trend in the financial performance of commercial banks with both increasing and decreasing trends being observed over the study period. The trends reveal unsteady fluctuations in the financial performance of commercial banks in Kenya.

Trend analysis of Number of ATMs

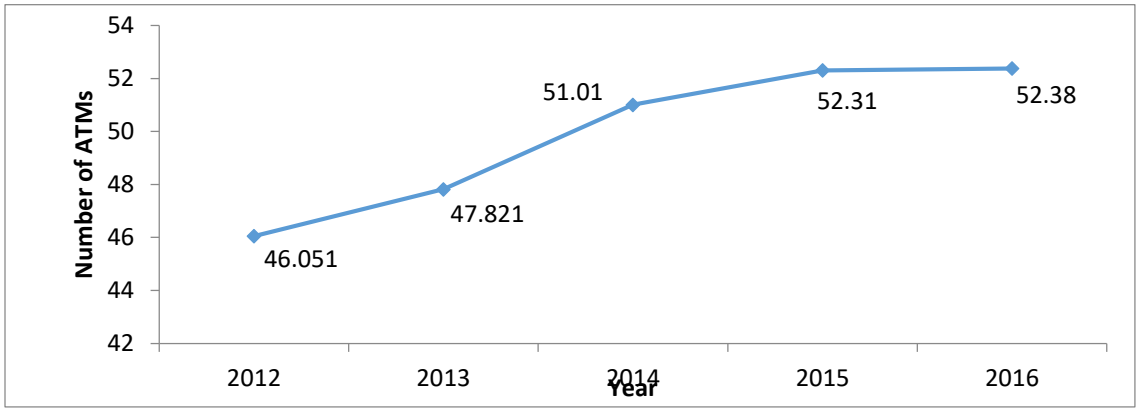


Figure 3: Trend analysis of Number of ATMs

The trends analysis reveals that the number of ATMS have on average been increasing over the study period from the year 2012 to the year 2016. This perhaps indicates the need to invest more in technology as many bankers are switching from over the counter to the use of technology.

Trend analysis of EFTs

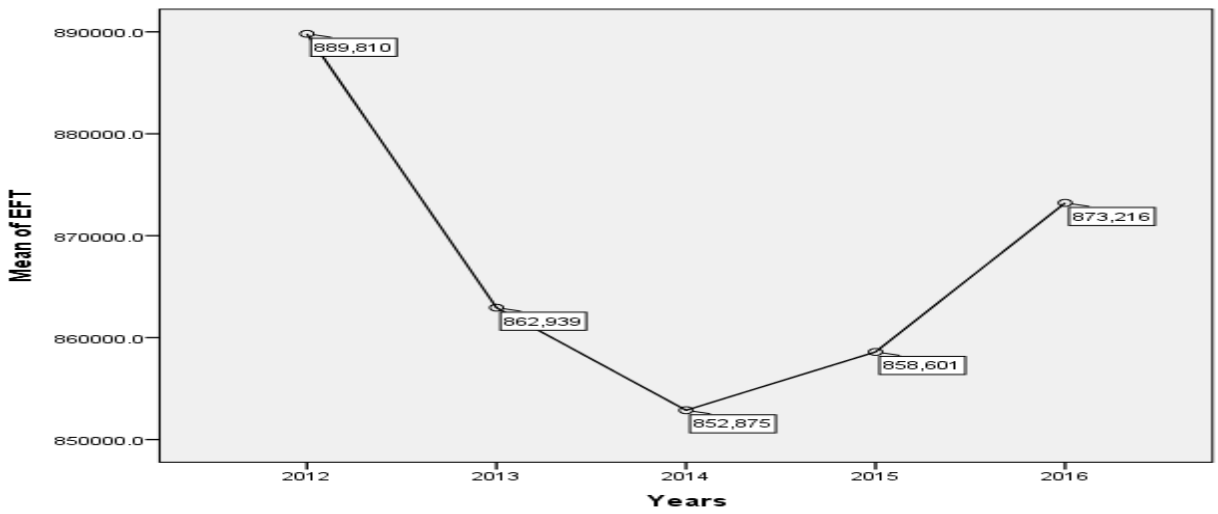


Figure 4: Trend analysis of EFTs

The trends analysis indicates that the amount of transactions through the EFTs decreased between the year 2012 and 2014 which can be attributed to the increase in the use of other advanced technologies such as mobile banking. From the year 2014, the transactions through EFTs have been increasing steadily. The results reveal unsteady trends in the transactions through EFTs.

Trend analysis of Agency Banking

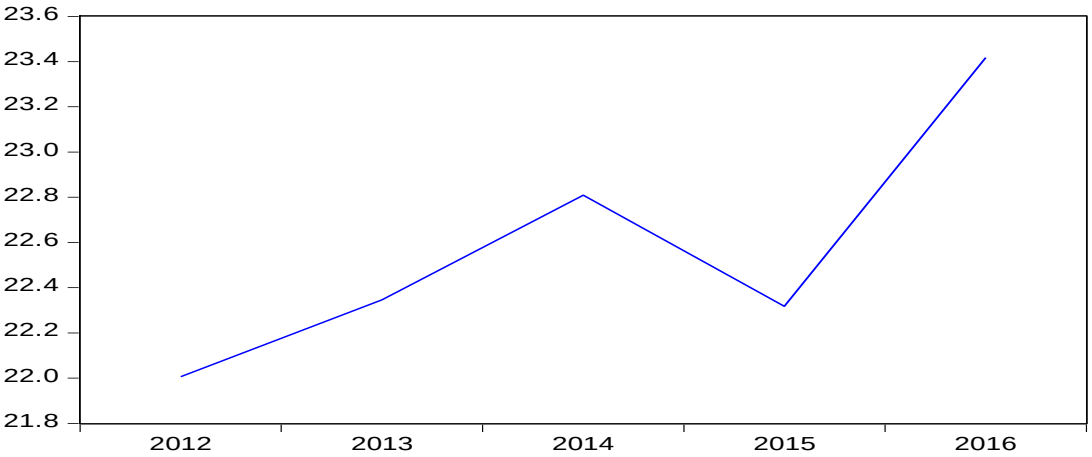


Figure 5: Trend analysis of Agency Banking

The results on figure 5 indicated that on average, the value transacted through agency banking services has been increasing with time. Apart from a decrease between 2014 and 2015, there

is an increasing trend in agency banking over the years up to the year 2016. This indicates that with an increase in the number of commercial banks offering agency services to 17, the value transacted using the model has also been increasing over time with an indication of trust in the model by the consumers.

Trend analysis of Mobile Banking

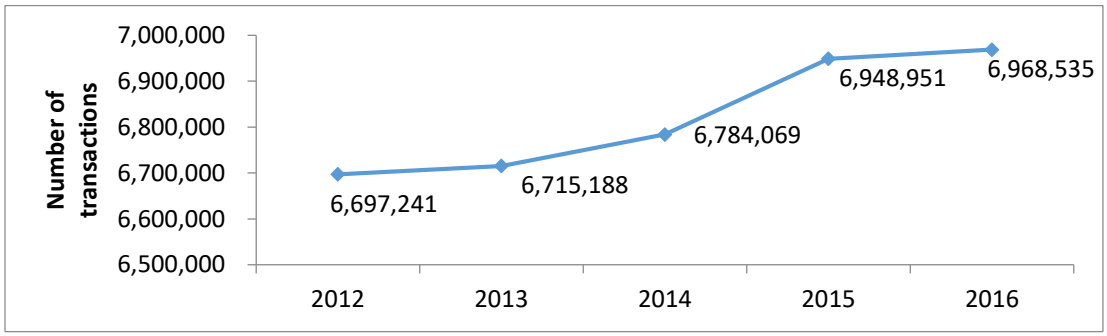


Figure 6: Trend analysis of M-Banking

Trend analysis of Online Banking

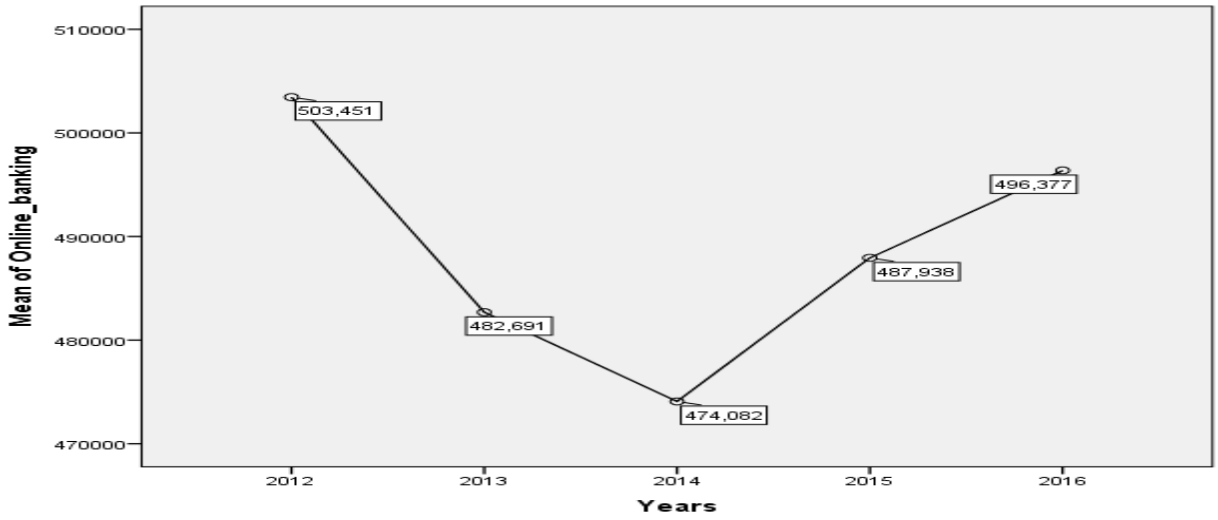


Figure 7: Trend analysis of Online Banking

The trends reveal that even as mobile banking was increasing though at a slower rate, online banking started with a decrease in the service after which the trend started to increase. The results reveal an increase in the subscription to the technology for the last three years.

Diagnostic Tests

Before running the regression analysis, the study ensured that the data obeyed the assumptions of classical linear regression entailing Heteroskedasticity, autocorrelation and multicollinearity.

Heteroskedasticity Test

The assumption of classical linear regression entails that the error term of a regression model needs to have a constant variance. When the error term don't have constant variance, its termed as Heteroskedasticity. The study tested for Heteroskedasticity using Likelihood Ratio Test.

Table 1 Likelihood ratio test for Heteroskedasticity

Likelihood ratio test	
Lr Chi2(3)	59.41
Prob > Chi2	0.054

The results in Table 1 indicate that the null hypothesis of Homoscedastic error terms is not rejected as supported by a Prob > chi^2 which is greater than the critical p value (0.05). The error term hence passed the test of Heteroskedasticity.

Autocorrelation Test

The assumption of classical linear regression also entails that the error term of a regression model should not be correlated over time. When the error term is correlated over time means that it is having a problem of autocorrelation. The study tested for presence of autocorrelation using Wooldridge test. The null hypothesis for the test is that there is no problem of autocorrelation.

Table 2 Wooldridge test for Autocorrelation

Wooldridge test for autocorrelation
H0: no first order autocorrelation
F(5, 189) = 15.995
Prob > F = 0.063

The findings in Table 2 reveal that the data did not have a problem of autocorrelation since the null hypothesis of absence of serial correlation was not rejected at 5% level of significance. This is because the Prob > F was 0.063 which is greater than the 5% level of significance.

Multicollinearity Test

The study conducted a multicollinearity test to establish whether the independent variables are highly correlated. A variance inflation factor method was used.

Table 3 Variance Inflation Factor Test of Multicollinearity

Variable	Tolerance	VIF
ATMS	0.965	1.036
EFT	0.572	1.749
Agency	0.853	1.173
Mobile banking	0.625	1.599
Online banking	0.844	1.185
Subscriptions	0.874	1.144

A VIF factor value less than 10 indicates no presence of multicollinearity. Since all the independent variables had a VIF value less than 10, there was no presence of multicollinearity. It was hence suitable to run an ordinary least square regression model.

Regression Analysis

The relationship between financial innovation and financial performance of commercial banks in Kenya was established using an ordinary regression analysis. The regression model established the model coefficient, model significance and model coefficients.

Coefficient of Determination

Table 4 Coefficient of Determination

R	R Square	Adjusted R Square	Std. Error of the Estimate
.364a	0.133	0.11	0.028859
Predictors: (Constant), Online banking, ATMS, Mobile banking, Agency, EFT			

The findings in Table 4 reveal that financial innovations explains up to 13.3% (R square = 0.133) of the financial performance of commercial banks in Kenya.

Model Significance

The study also established the model significance of the regression model linking financial innovation to financial performance of commercial banks in Kenya.

Table 5 Model Significance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.024	5	0.005	5.784	.000
Residual	0.157	189	0.001		
Total	0.181	194			
Dependent Variable: ROA					
Predictors: (Constant), Online banking, ATMS, Mobile banking, Agency, EFT					

The study findings in Table 5 revealed that the overall model was significant. The F statistic for the model of 5.784 was significant (Sig = 0.000), hence an indication that the model linking financial innovation to financial performance of commercial banks in Kenya was significant.

Model Coefficients

Predictor Variable	**Beta**	**Std. Error**	**t**	**Sig.**
(Constant)	(0.017)	0.0182	-0.935	0.351
ATMS	0.002	0.0007	2.298	0.023
EFT	0.001	0.0004	2.637	0.009
Agency	0.003	0.0010	3.137	0.002
Mobile banking	0.005	0.0029	2.729	0.045
Online banking	0.0001	0.0001	1.277	0.203
Dependent Variable: ROA				

The findings reveal that the financial innovations which significantly affect financial performance of commercial banks in Kenya are the number of ATMs, EFTs, Agency banking and mobile banking. The number of ATMs has a positive (Beta = 0.002) and significant (Sig = 0.023, < 0.05) effect on financial performance of commercial banks in Kenya. This shows that a unit increase in the number of ATMS leads to a 0.002 unit increase in returns on Assets of commercial banks in Kenya. The results also showed that EFTs has a positive (Beta = 0.001) and significant (Sig = 0.009,< 0.05) effect on financial performance of commercial banks in Kenya. This shows that a unit increase in the transactions made through EFTs leads to a 0.001 unit increase in returns on Assets of commercial banks in Kenya.

Agency banking also has a positive (Beta = 0.003) and significant (Sig = 0.002, < 0.05) effect on financial performance of commercial banks in Kenya. This shows that a unit increase in the number of transactions leads through agency banking leads to a 0.003 unit increase in returns on Assets of commercial banks in Kenya. Mobile banking was established to have a positive (Beta = 0.005) and significant (Sig = 0.045, < 0.05) effect on financial performance of commercial banks in Kenya. This shows that a unit increase in the number of transactions made through mobile phone leads to a 0.045 unit increase in returns on Assets of commercial

banks in Kenya. On the other hand, online banking doesn't have a significant effect on financial performance of commercial banks in Kenya.

Moderating Effect of User Acceptance

The moderating effect of user acceptance measured through the number of subscriptions to the technology was established through a Moderated Multiple Regression (MMR) analysis. The indicators of financial performance were combined through product and regressed against financial performance in the same regression model with user acceptance. The R square and model significance was then established.

Table 7 Model Summary after Moderation

R	R Square	Adjusted R Square	Std. Error of the Estimate
.530a	0.28	0.269	0.02615
a Predictors: (Constant), Interacting term, Subscriptions, Financial innovation			

The findings in Table 7 reveal that the R square increased from 13.3% to 28% which indicates that user acceptance has a moderating effect on financial performance of commercial banks. The findings also showed that user acceptance has a significant moderating effect on the relationship between financial innovation and financial performance of commercial banks in Kenya. This is because the beta coefficient of the interacting term is significant. The moderating effect is positive indicating that an increase in user acceptance leads to an increase in the effect of financial innovativeness on financial performance.

Table 8 Model Coefficients

Predictor Variable	B	Std. Error	t	Sig.
(Constant)	0.0080	0.0030	2.449	0.015
Financial innovation	0.0001	0.0001	2.153	0.033
Subscriptions	0.6180	0.0810	7.674	0.000
Interacting term	0.0010	0.0004	2.843	0.027
Dependent Variable: ROA				

Conclusions

The study findings led to the conclusion that an increase in the number of ATMS leads to an increase in returns on Assets of commercial banks in Kenya. Furthermore, an increase in the transactions made through EFTs leads to an increase in returns on Assets of commercial banks in Kenya. Another conclusion made by the study is that an increase in the number of transactions through agency banking leads to an increase in returns on Assets of commercial banks in Kenya. The study further concluded that an increase in the number of transactions made through mobile phone leads to an increase in returns on Assets of commercial banks in Kenya. Of the investigated financial innovations, the study concluded that online banking doesn't have a significant effect on financial performance of commercial banks in Kenya.

Another recommendation made by the study is that user acceptance has a significant moderating effect on the relationship between financial innovation and financial performance of commercial banks in Kenya.

Recommendations

The study recommends that since financial innovations technologies such as ATMS, EFTs, agency banking and mobile banking affect financial performance positively, there is a need for commercial banks to consider investing more in these technologies so as to enhance their performance in the long run. The study also recommends that since online banking has a positive but not significant effect on financial performance of commercial banks, the study recommends that commercial banks should reevaluate their policies on investment on online mobile banking so as to record significant effects. The study also recommends that there is a need to create more awareness so as to enhance the subscription rate to new technologies by users of the new technology.

Acknowledgement

This project would not have been possible without the support of many people. Thanks to God, the Almighty for the not so obvious reasons. To my family and numerous friends who endured this long process with me, always offering support and love. To my Supervisors; Ms. Haldes Nguta and Dr. Mohamed Shano, I say thank you for your continued support and guidance. Special thanks to my employer for giving me an opportunity to advance my career. Finally, thanks to Meru University of Science and Technology fraternity for providing the necessary environment and resources to assist in the successful completion of this work

References

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: a 30-year review.

Arnaboldi, F., & Rossignoli, B. (2015).Financial Innovation in Banking. In Bank Risk, Governance and Regulation (pp. 127-162). Palgrave Macmillan UK.

Avlonitis, G. J., Papastathopoulou, P. G., & Gounaris, S. P. (2001). An empirically-based typology of product innovativeness for new financial services: Success and failure scenarios. Journal of Product Innovation Management, 18(5), 324-342.

Beck, T., Chen, T., Lin, C., & Song, F. M. (2014). Financial innovation: The bright and the dark sides. Available at SSRN 1991216.

Bhattacherjee, A. (2000). Acceptance of e-commerce services: the case of electronic brokerages. IEEE Transactions on systems, man, and cybernetics-Part A: *Systems and humans*, 30(4), 411-420.

Boot, A. W., & Marin, M. (2010). Financial innovation: Economic growth versus instability in bank-based versus financial market driven economies: *Research Handbook on International Banking and Governance Queries*.

Central Bank of Kenya. (2010). Annual Report 2010. Nairobi: Government printers.

Central Bank of Kenya. (2014). Commercial Banks & Mortgage Finance Institutions. Central Bank of Kenya Retrieved 10 March 2016.

Central Bank of Kenya. (2015). Annual Report 2015. Nairobi: Government printers.

Cherotich, K. M. (2013). The Effect of Financial Innovations on Financial Performance of Commercial Banks in Kenya.

Cherotich, K. M., Sang, W., Shisha, A., &Muting's, C. (2015). Financial Innovations and Performance of Commercial Banks in Kenya.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management science, 35(8), 982-1003.

DiMasi, J. A., Hansen, R. W., & Grabowski, H. G. (2003). The price of innovation: new estimates of drug development costs. *Journal of health economics*, *22*(2), 151-185.

Domeher, D., Frimpong, J. M., & Appiah, T. (2015).Adoption of financial innovation in the Ghanaian banking industry. *African Review of Economics and Finance*, 6(2), 88-114.

Edquist, C., & Hommen, L. (1999). Systems of innovation: t*heory and policy for the demand side. Technology in society*, 21(1), 63-79.

Elliot, S., &Loebbecke, C. (2000).Interactive, inter-organizational innovations in electronic commerce. *Information Technology & People*, 13(1), 46-67.

Hiltunen, M., Heng, L., Helgesen, Laukka, M., & Luomalu, J. (2002). Mobile User Experience. Hel-sinki: Press.

Kamotho, J. N. (2009). The relationship between agency banking and financial performance of commercial banks in Kenya. *Unpublished* MBA project. University of Nairobi.

Kane, E. J. (1981). Accelerating inflation, technological innovation, and the decreasing effectiveness of banking regulation. *The Journal of Finance*, *36*(2), 355-367.

Kasiulevičius, V., Šapoka, V., & Filipavičiūtė, R. (2006). Sample size calculation in epidemiological studies. Gerontologija, 7(4), 225-231.

Kihumba, C. W. (2008). Determinants of Financial Innovation and its effects on banks performance in Kenya. *Unpublished* MBA project. *University of Nairobi.*

Lerner, J. (2002). When bureaucrats meet entrepreneurs: the design of effective public venture capital programmes. *The Economic Journal*, 112(477)234-236.

Llewellyn, D. T. (2009). Financial innovation and a new economics of banking: Lessons from the financial crisis. Challenges for Monetary Policy-makers in Emerging Markets, 1.

Matevu, R. M & Kerongo, F. (2015). Effects of Technological Innovations on Financial Performance of Commercial Banks in Kenya: A Case of Equity Bank of Kenya. *Strategic Journal of Business & Change Management*, 2(5), 92-102.

Mugambi, D., 2006. A survey of internal service delivery systems in Nigeria commercial bank. MBa Thesis, University of Ilorin.

Ngami, P. M. (2014). Effect of bank innovations on financial performance of commercial banks in Kenya (*Doctoral dissertation*).

Niehans, J. (1989). Transaction costs. In *Money* (pp. 320-327). Palgrave Macmillan UK.

Nofie, I. (2011). The diffusion of electronic banking in Indonesia. Manchester Business School.

Nofie, I. (2011). The diffusion of electronic banking in Indonesia, Manchester Business School

Obay, L. (2014). Financial innovation in the banking industry: the case of asset securitization. Routledge.

Oloko, M. A. & Gichungu, Z.N. (2015).Relationship between Bank Innovations and Financial Performance of Commercial Banks in Kenya.

Olweny, T., and Shipho, T.M (2011),"Effects of banking sectoral factors on the financial performance of commercial banks in Kenya," *Economic and Finance Review*, 1(5),1-30.

Otoo, I. C. (2013). The effects of financial innovations on the financial performance of commercial banks in Kenya (*Doctoral dissertation*).

Roberts, P. W., & Amit, R. (2003). The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science*, *14*(2), 107-122.

Sathye, M. (2003). Efficiency of banks in a developing economy: The case of India. *European Journal of Operational Research*, 148(3), 662-671.

Schumpeter, J. A. (1934). The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle (Vol. 55). *Transaction publishers.*

Sergeant, K. A. (2001). "The Role of Commercial Banks! N Financing Growth and Economic Development in Trinidad and Tobago and the Caribbean: A Perspective from the Royal Bank of Trinidad and Tobago. Central Bank of Belize.

Silber, W. L. (1983). The process of financial innovation. *The American Economic Review*, 73(2), 89-95.

Simiyu, R. S., Ndiang'ui, P. N., & Ngugi, C. C. (2014). Effect of Financial Innovations and Operationalization on Market Size in Commercial Banks: A Case Study of Equity Bank, Eldoret Branch. *International Journal of Business and Social Science*, 5(8), 48-64

Tufanao, P. (2002) 'Financial innovation' in Handbook of the *Economics of Finance*, vol.1, part 1: 307-335.

Wafula, E. E. (2015). Effect of plastic money on the financial performance of commercial banks in Kenya (Doctoral dissertation, University of Nairobi).

Wooldridge, J.M. (2002). Econometrics analysis of cross section and panel data. Massachusetts: MIT press.