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FINANCIAL INNOVATIONS AND PERFORMANCE OF TIER III COMMERCIAL BANKS IN KENYA

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ABSTRACT

The CBK reports pointed out a number of commercial banks facing issues with their financial performance to include Eco Bank, Equatorial Commercial Bank, Consolidated bank and Credit Bank. Other institutions like Chase, Dubai and Imperial bank have been placed under receivership. The belief in the sector is that introducing innovations will improve performance. This study sought to establish the effect of financial innovation on the financial performance of tier III commercial banks in Kenya. Specifically, the study looked at i-banking and agency banking and their effect on the financial performance of tier III commercial banks in Kenya with Central Bank of Kenya regulation as the moderating variable. The innovation diffusion theory, the agency theory and the regulatory capture theory were used to underpin the study. The study adopted causal research design and census to a population of 21 tier III commercial banks in Kenya. Secondary data was collected over a period of 2016 to 2020 using a data collection sheet. Content and face validity were adopted with the help of the supervisor. Reliability was established through Cronbach Alpha Coefficient with the 0.7 taken as the threshold. Diagnostic tests were conducted on the secondary data covering multicollinearity, autocorrelation, normality test and heteroskedasticity test. In order to test the formulated hypotheses, inferential statistics covering regression analysis was conducted and the deductions were drawn based on p-values that were interpreted at 5% level of significance. The analyzed findings were presented through tables and figures. The study established that i-banking and agency banking all have a positive and statistically significant effect on financial performance partially moderated by Central Bank of Kenya regulations. The study concluded that financial innovations have a significant effect on financial performance and this is partially moderated by CBK regulation. The study recommended that ICT managers of the tier III commercial banks in Kenya should partner with telecommunication companies like Safaricom and Airtel to subsidize the costs of accessing banking services through the internet The direct sales representatives of the Tier III commercial banks in Kenya should increase marketing efforts of agency banking so as to significantly contribute to financial performance.

Key Words: *Financial innovations, agency banking, internet banking, tier III commercial banks*

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INTRODUCTION

Proper financial performance seeks to ensure that shareholders have been rewarded for investing their funds to the firm. Better financial performance supports the growth and development of the economy (Makkar & Singh, 2013). Analyzing financial performance, especially in a commercial bank has gained a lot of relevance among different scholars especially after the Global Financial Crisis (2007/08) (Nguena, 2019). The financial performance of commercial banks can be shaped by both external and internal factors. To enhance their financial performance, commercial banks have realized the need to embrace financial innovation. Gorton and Metrick (2010) shared the role played by financial innovation in a bank to revolve around customization, the need to reduce costs, and risks.

Globally, Tahir, Shah, Arif, Ahmad, Aziz and Ullah (2018) recognized financial innovations in Pakistan to cover processes, institutions and products. In Turkey, Azimova (2021) said that financial innovations improve the performance and thus profitability of the financial entity. Among South Asian countries, Qamruzzaman and Wei (2019) covered Sri Lanka, Nepal, Pakistan, India, Bangladesh and Bhutan arguing that financial innovation allow banks to realization their intermediation role within an economy which increases the customer base thus more revenues and profits that translate to better financial performance.

Regionally, with emphasis on West Africa, Ajide (2016) said that financial innovation can bring about a surge in demand for money, especially with an improvement in systems of payment while increasing the demand for liquid assets among individuals. All these issues have contributed towards an improvement in financial performance. Elseed and Elzain (2018) shared that financial innovation has improved the performance of commercial banks in South Sudan.

In Kenya, although Mwawasaa and Ali (2020) looked at financial innovations, the measures used were financial processes, financial markets and financial products and financial institutions. Omwanza and Jagongo (2019) financial innovations have made it easier for financial institutions to carry out their processes and activities. The study by Said and Kaplelach (2019) looked at mobile banking innovations and their contribution towards financial performance.

Kenyan banks have adopted a tier system of classifying institutions as depicted in appendix IV. A total of 3 tiers have been established based on the total asset base and the market share commanded by these institutions. There are 21 tier III commercial banks operating in Kenya (appendix IV). Statistics from CBK reports indicate that tier III banks are having issues with regard to their financial performance. A good example is the Development Bank of Kenya whose liquidity level as of 2017 stood at -21.6% (CBK, 2019).

Statement of the Problem

Financial performance has remained a challenge with commercial banks operating in Kenya. For instance, the CBK report (2019) pointed out a number of commercial banks facing issues with their financial performance to include Eco Bank, Equatorial Commercial Bank, UBA, Consolidated Bank, and Credit Bank. Other institutions like Chase, Dubai, and Imperial bank have been placed under receivership (CBK, 2019). It is from these concerns on financial performance that some of the banks like Jamii Bora and NBK have been forced to undergo mergers. Thus, financial innovation would be the next strategy to salvage the adversely affected commercial banks in Kenya.

The available studies include Mchembere and Jagongo (2017) who looked at agency banking and its interplay with profitability prospects of the banks. The study noted the existence of a direct link. Dzombo, Kilika and Maingi (2017) looked at agency and electronic banking in relation to the ability of banking entities to perform financially, establishing a significant role. Mbugua and Omagwa (2017) sought to relate agency banking and financial performance of banks in Embu while

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Mohamud and Mungai (2019) did an analysis of financial innovations and performance of banks in Garissa.

However, the studies generated inconsistent findings, for instance, (Ngumi, 2013; Kariu, 2017; Chimwemwe & Muthinja 2018; Rosenbusch et al., 2011) indicate a direct and significant link between financial innovation and profitability. Other studies (Rogers, 2012; Franscesa & steven, 2012; Kisaka, 2015, Mchembere & Jagongo, 2017) show the presence of an inverse or weak link with financial performance. Furthermore, the majority of the empirical studies examined utilized descriptive research design only hence did not relate the components of branchless banking with financial performance. These include Wachira and Ondigo (2013), Cherotich et.al (2015), Ahmed and Wamugo (2018) and Kisaka *et.al* (2015).

The aforementioned studies create conceptual and contextual gaps as some of them were done in other countries away from Kenya. In filling these gaps, the present study sought to explore how financial innovations are linked with Financial Performance.

Objectives of the Study

- To establish the effect of internet banking on financial performance of tier III commercial banks in Kenya
- To determine the effect of agency banking on financial performance of tier III commercial banks in Kenya
- To investigate trhe moderating effect of CBK regulations on the relationship financial innovations and performance of tier III commercial banks in Kenya

The study was guided by the following hypothesis;

- H_{01}: Internet banking has no significant effect on financial performance of tier III commercial banks in Kenya
- H_{02}: agency banking has no significant effect on financial performance of tier III commercial banks in Kenya
- H_{03}: CBK regulations has no significant moderating effect on the relationship financial innovations and performance of tier III commercial banks in Kenya

LITERATURE REVIEW

Theoretical Review

Theory of Diffusion of Innovations

Coming into existence by Rogers (1995), the essence of DOI theory is to provide an explanation of how, why, and the rate at which new technologies get to spread in an organizational setting. The theory argues that new ideas are spread at the pace determined by the following issues: the innovation, channels of communication, time, and socially established systems. Diffusion is viewed by Rogers as the process where innovations are communicated over a given period of time among parties within the social setting. Rogers (2003) view adoption as the ability to fully utilize innovation as one of the available courses of action.

There are four basic elements that provide foundation of this theory; the socially established systems, channels of communication, time and the innovation itself. Hernadez and Mazzon (2006) said that innovations can be embraced in an entity whenever they are well aligned with the values of a specified organization. Gardachew (2010) shared the key issues that inform diffusion of any innovation which include complexity, compatibility, pros, trialability and observability. The criticisms leveled against this theory include the argument that it fails to consider the resources at an individual level (Shrader & Duflos, 2014).

This theory is used to provide an explanation of how financial innovations are embraced by commercial banks to enhance their financial performance. It provides information on how banks embrace specific financial innovations like internet banking platforms.

Agency Theory

They were Meckling and Jensen (1976) who advanced this theory and it seeks to provide the link

between the principal (the bank) and the agents (representative of the bank under the agency banking framework) as they interact with each other. In this interaction, the agent ensures that all the undertakings are on behalf of the principal. However, in most cases, the bank agent will not undertake actions that are aligned with the wants of the principal and thus creating conflicts of interest. Thus, the conflicting interests within the agency theory arise whenever these agents engage in self-interested goals and objectives that are well aligned with what the principal requires (Panda & Leepsa, 2017).

In aligning the interests of the principal and the agents together, there should be some monitoring mechanisms (check and balance) including fair reward and remuneration of the agent. The agency theory has been criticized on several grounds based on its inherent assumptions (Pouryousefi & Frooman, 2017). Rowe (1982) argues that the agency presupposes incompatibilism this is the view that freedom and responsibility of individuals are not logically compatible. Eisenhardt (1989) argues that agency theory helps in explaining the information systems in an organization.

This theory will be used to underpin the independent variable agency banking with financial performance. Ideally, the agency banking model operates in a such a way that the authorized agents must carry out operations on behalf of the bank which is as the principal. Thus, the interaction between the agents and the bank will determine overall financial performance of the bank. Based on this agency theory, the relationship between agency banking and financial performance can be mixed (because of existance of conflict of interest).

Regulatory Capture Theory

Stigler (1971) and Posner (1974) are believed to have developed this theory. The theory provides a contrary view of regulations by arguing that in as much as regulations are established to ensure the public is protected, there are some specific groups of people in the economy that control and influence these regulatory mechanisms for personal gain. As such, the intentions of regulations end up not being realized. Posner (1974) argues that with time, the established regulations come to serve the interests of the industry that is involved. Stigler (1971) provides some of the tools that can be used by the regulator to control the participants which include restriction of new entrants, the use of subsidies, and fixation of prices.

In the banking sector, regulatory capture could stem where some well-established commercial bank networks may promote some regulations that may limit new entrants. The theory will be used to underpin the moderating variable CBK regulatory framework and the role it plays in financial innovations and the performance of commercial banks in Kenya. There are some previous empirical studies on regulations including Mabeya et al., (2016) and Korutaro (2013) who leveraged on this regulatory capture theory.

Empirical Literature Review

Internet banking and financial performance of Tier III commercial banks

The study conducted among commercial banks in Rome by Stoica, Mehdian and Sargu (2015) largely concentrated on internet banking and its connection with performance. Performance in this study was analyzed in terms of efficiency. In total, 24 banking entities were covered. It emerged that only few banks had embraced internet banking as they strive to carry out operations.

Among commercial banks in India, Sidhu (2018) did an analysis of internet banking and performance. The adopted methodology in this study wasd panel data. In total, 31 entities were included in the study. The horizon covered by the inquiry covered 1997 all through to 2016. It was shown that internet banking helps banking entities to drive their performance in terms of ROA and ROE.

Using a case of Nigeria, Madugba, Egbide, Jossy, Agburuga and Chibunna (2021) did an investigation on e-banking and its link with financial performance of banks. Information was gathered from already documented sources. The embraced study design

was ex-post facto. Noted from the findings was the fact that ATMs have a direct and significant connection with ROA and ROE.

Chung and Dutta (2012) looked at e-banking and its adoption within the banking entities. It was shown that e-banking contributes towards reduction in costs which allow banks to generate sufficient profits. Online banking has increased the pace of growth among banking entities increasing the market share. Mateka, Gogo, and Omagwa (2016) showed that internet banking has a significant link with financial performance. Njoroge and Mugambi (2018) analyzed how electronic banking is linked with financial performance with emphasis on Equity Bank. The inquiry leveraged the branches of Equity Bank within Nairobi as the unit of analysis where 100 participants were sampled out. It was noted that a challenge of scam is evident among different people who may have used ATMs. This was a case study; the present study will cover all the banking entities in the Kenyan context.

Atavachi, (2013) looked at e-banking and financial performance. The specific focus of the inquiry was on deposit-taking microfinance entities in Kenya. In total, 9 MFIs were targeted and first-hand information was gathered supported by questionnaires. It was shown that the internet and other technologies have supported and enhanced the performance of the MFIs. However, this inquiry focused on MFIs, the present study will be done among commercial banks and thus the gap.

Agency Banking and Financial Performance of Tier III Commercial Banks

A study was conducted in Tanzania by Mwasakabeto (2020) whose focus was on linking agency banking and performance. The inquiry embraced a case study approach. Partcipants were selected through simple random sampling and information obtained from first hand sources. A direct and significant link was registered between agency banking and performance. The study conducted in Uganda by Nimwesiga (2019) focused on agency banking and performance of banking entities. Participants were agents and clients to the banking entities. The inquiry obtained mixed results such that access to banking services and customer transaction were significant, cost of service through agents was not significant.

Veniard *et.al* (2010) sought to link bank agents and their interplay with the ability of banking entities to perform financially. Noted was the fact that the use of agents allows banking entities to perform in a better way. Mbugua and Omagwa (2017) analyzed how agents in the banking entities are linked with performance in financial dimensions. Embu County was the point of reference of this inquiry. It was shown that the adoption of the agency model of banking can enhance the performance of the bank through cost reduction efforts. A related study conducted by Kandie (2011) focused on accessibility to agency services and how it supports the ability of the banks to perform financially. The inquiry used a case of listed banks. It emerged that the use of agents and performance are interlinked.

Mchembere and Jagongo (2017) conducted a study on agency banking and profitability. The adopted design in this inquiry was descriptive and an inverse and significant link were noted. Musau and Jagongo (2015) used a case of Kenyan banks to provide the link between the need to utilize agency banking and the performance of bans. The inquiry shared that the use of agents was significantly linked with financial performance. Ndambuki (2015) did a study on agency banking and its interplay with profitability. The study used a case of banking entities in Kenya. The design embraced in this study was descriptive. It was noted that agency banking has no significant link with profitability. However, the study used only one variable for innovation is a major shortcoming for this study.

A study was conducted in Tanzania by Mwasakabeto (2020) whose focus was on linking agency banking and performance. The inquiry embraced a case study approach. Partcipants were selected through simple random sampling and information obtained from first hand sources. A direct and significant link was registered between

agency banking and performance. The study conducted in Uganda by Nimwesiga (2019) focused on agency banking and performance of banking entities. Participants were agents and clients to the banking entities. The inquiry obtained mixed results such that access to banking services and customer transaction were significant, cost of service through agents was not significant.

Central Bank of Kenya Regulations and Performance of Tier III Commercial Banks

Leveraging data from 23 industrial countries from 1975 to 1999, Copelovitch and Singer (2008) did explore the interplay between financial regulations, monetary policies and inflationary pressure. It was shown that central banks that have the responnsbility of regulating banks will be keen towards stability and profitability of the banking entities. In Asia, Akhtar, Lorie and Petersend (2009) analyzed the effectiveness demonstrated by central banks as far as financial crisis are concerned. It was shown that central babnks formulate regulations that influence stability of banks in general. Relying onm data from 71 nations and 857 banking entities, Pasiouras, Gaganis and Zopounidis (2006) analyzed bank regulation, structure of the market, supervision and rating of banks. The study showed that regulations are key for soundness of the financial sector.

Nyakarimi, Kariuki, and Kariuki (2019) looked at government regulations as a moderator variable in the link between internal systems of control and the prevention of fraud with a specific focus on Kenyan banking entities. Collection of the data was done with aid of the questionnaires that were structured with the response rate standing at 84.6%. Structural equation model (SEM) helped in the analysis of the questionnaire. The regulations of the government were seen to significantly moderate the link between internal systems of control and prevention of fraud among banking entities. Wasike (2017) looked at financial regulations and the moderating role they play in the link between corporate governance the ability of financial entities to perform. In total, 236 financial entities were covered focusing on the time period from 2010 all through to 2015. In selection of the participants in the inquiry, sampling was conducted using stratified method. ROE and ROI were the key proxies of gauging performance. It was shared the established financial regulations moderate the link between corporate governance and ability of the entity to perform. Kimani *et al.* (2015) covered regulations of the government as a moderator in recovery of costs and ability to finance investment in water. The design adopted was a descriptive survey with information being gathered with aid of the questionnaires. The inquiry shared that regulations by the government were significant moderators.

Ndolo (2017) adopted panel data where the CBK regulations were operationalized into regulations governing liquidity management, credit risk management, and capital adequacy. Out of these regulations, only capital adequacy had a significant link with financial performance of the banking entities. Kaloki (2018) did a study on CBK regulations and their link with the ability of microfinance entities to perform in financial terms. The adopted design was descriptive with 13 MFIs being targeted. Information was obtained through a questionnaire. CBK regulation was operationalized into operational requirements, capital adequacy, and financial reporting requirements. The study noted that CBK regulation has a significant link with the ability of commercial banks to perform in financial terms.

Mwongeli (2016) sought to bring out the link between regulation and the ability of the Kenyan banking entities to perform in financial terms. The studied regulations were operationalized into capital adequacy and the capital requirement with 43 banking entities being targeted. The study noted that the regulations do not significantly drive and enhance the performance of the banking entities. Momanyi (2018) did an inquiry into financial regulations and their link with financial inclusion, with emphasis on the banking industry. The adopted methodology was a survey and it targeted

all the licensed banking entities. The information was gathered with aid of the questionnaires. The analysis demonstrated a direct and significant link between financial regulations and financial inclusion. Muturi (2019) looked at government regulations and their moderating role in the link between the contract terms of the mortgage and the ability of real estate entities to perform. The information of the inquiry was gathered from primary sources with aid of the questionnaire with 138 respondents being targeted. SEM helped in testing the formulated hypotheses of the inquiry. A significant link was noted between government regulations as a moderator indicator of the variable.

Leveraging data from 23 industrial countries from 1975 to 1999, Copelovitch and Singer (2008) did explore the interplay between financial regulations, monetary policies and inflationary pressure. It was shown that central banks that have the responnsbility of regulating banks will be keen towards stability and profitability of the banking entities. In Asia, Akhtar, Lorie and Petersend (2009) analyzed the effectiveness demonstrated by central banks as far as financial crisis are concerned. It was shown that central babnks formulate regulations that influence stability of banks in general. Relying onm data from 71 nations and 857 banking entities, Pasiouras, Gaganis and Zopounidis (2006) analyzed bank regulation, structure of the market, supervision and rating of banks. The study showed that regulations are key for soundness of the financial sector.

METHODOLOGY

The positivism philosophy was embraced by this inquiry. Levin (1988) believes that this philosophy holds that reality is stable where one can observe and describe it from a perspective that is deemed to be more objective.

The causal research design was adopted in this study. Through this design, one is able to gather relevant information for testing of the hypothesized link. The design supported the testing of the developed hypotheses to draw relevant inferences.

The study considered the models below:

$Y = ß_0+ß_1X_1+ß_2X_2+ß_3X_3+ß_4X_4 + \varepsilon$ ………………… (1)

$Y = ß_0 + ß_1FI + ß_2CBKReg + \varepsilon$ …………… (2)

$Y = \beta_0 + \beta_1FI^* CBKReg+ \beta_2CBKReg^* CBKReg + \varepsilon$ … (3)

Where: Independent Variables:

X_3- Internet Banking

X_4- Agency Banking

CBK Reg CBK Regulations

FI Financial Innovations

Dependent Variable:

Y -Financial Performance

Where: Moderating Variable:

X5 - CBK Regulation

Regression Parameters:

β0 - Constant

β_1,β_2, β_3, β_4 - Regression coefficients

ε - Error term

In this inquiry, 21 tier III banks were targeted. The reason for selecting tier III banks was because they were the largest in number compared to the other tiers. This provided a relatively larger unit of analysis.

Sampling is fishing out representative elements from the targeted population for inclusion in the inquiry (Kothari, 2004). This inquiry embraced census since the targeted population was relatively small and could easily be accessed. Thus, all the tier III commercial banks were involved in the inquiry.

The inquiry relied on information gathered from auxiliary sources. Data collection sheets helped in gathering the information. The horizon considered by the inquiry was (2016-2020). It was collected from published reports from respective banks and the CBK reports. Secondary data was collected using a data collection sheet.

The processing of the gathered data was realized descriptively and inferentially. This entailed the use

of means and standard deviations as well as regression modeling. In presenting the analyzed views, figures and tables were embraced. SPSS tool supported the processing of the gathered information.

The specific tests conducted in this study included multicollinearity, normality and heteroskedasticity test. Multicollinearity is a situation when at least one of the independent variables of the study is correlated with each other (Zeileis & Hothorn, 2002). This should not be the case as it is the violation of the regression assumptions. In testing for multicollinearity, the values of Variance of Inflation Factors (VIF) were computed. The rule of thumb was that VIF with range of 1-10 showed absence of multicollinearity in the data (Habbema, Eijkemans, Krijnen & Knottnerus, 2002).

Normality tests are conducted to determione if the data is normally distributed. The values of Shapiro-Wilk testv was conducted to test for normality assumption and the p-values were appropriately interpreted (Riani & Atkinson, 2000). Heteroskedasticity is a situation where there is no constant variance in the data. This test was determined through graphical method and observation of the pattern was used to rule out presence of this assumption (Atkinson & Riani, 2000).

FINDINGS

Correlation Analysis

Correlation analysis was conducted to establish the relationship between financial innovation and performance as summarized in Table 1.

Table 1: Correlation Results

		ROA	Internet Banking	Agency Banking	CBK Regulation
ROA	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	105			
Internet Banking	Pearson Correlation	.864	1		
	Sig. (2-tailed)	.000			
	N	105	105		
Agency Banking	Pearson Correlation	.198	.421	1	
	Sig. (2-tailed)	.043	.000		
	N	105	105	105	
CBK Regulation	Pearson Correlation	.390	.457	.308	1
	Sig. (2-tailed)	.000	.000	.001	
	N	105	105	105	105

The results in Table 1 showed that internet banking (r=.864) has a strong and positive relationship with financial performance. This means that internet banking has a far reaching implication on financial performance of tier III commercial banks in Kenya. This finding was consistent with Yang, Li, Ma and Chan (2018) who caried out an inquiry on the adoption of an electronic system of banking and its link with the performance of banks in China where it was shown that adopting electronic forms of banking may result in an improvement in the performance of banking entities in China on account of ROA, ROE, and NIM. Mateka, Gogo, and Omagwa (2016) showed that internet banking has a significant link with financial performance. Atavachi, (2013) looked at e-banking and financial performance where it was shown that the internet and other technologies have supported and enhanced the performance of the MFIs. Using a case of Nigeria, Madugba, Egbide, Jossy, Agburuga and Chibunna (2021) did an investigation on e-banking and its link with financial performance of banks and noted that ATMs have a direct and significant connection with ROA and ROE. Among

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commercial banks in India, Sidhu (2018) did an analysis of internet banking and performance where it was shown that internet banking helps banking entities to drive their performance in terms of ROA and ROE.

At the same time, CBK regulation (r=.390) has a moderate and positive relationship with financial performance. These findings are supported by Wasike (2017) who looked at financial regulations and the moderating role they play in the link between corporate governance the ability of financial entities to perform where it was shared the established financial regulations moderate the link between corporate governance and ability of the entity to perform. Kimani *et al.* (2015) covered regulations of the government as a moderator in recovery of costs and ability to finance investment in water and shared that regulations by the government were significant moderators. Kaloki (2018) did a study on CBK regulations and their link with the ability of microfinance entities to perform in financial terms and noted that CBK regulation has a significant link with the ability of commercial banks to perform in financial terms. Mwongeli (2016) sought to bring out the link between regulation and the ability of the Kenyan banking entities to perform in financial terms and noted that the regulations do not significantly drive and enhance the performance of the banking entities. Momanyi (2018) did an inquiry into financial regulations and their link with financial inclusion, with emphasis on the banking industry and demonstrated a direct and significant link between financial regulations and financial inclusion. Muturi (2019) looked at government regulations and their moderating role in the link between the contract terms of the mortgage and the ability of real estate entities to perform where a significant link was noted between government regulations as a moderator indicator of the variable.

Similarly, agency banking (r=.198) has a weak but positive relationship with financial performance. Veniard *et.al* (2010) sought to link bank agents and their interplay with the ability of banking entities to perform financially and it was noted that the use of agents allows banking entities to perform in a better way. Mbugua and Omagwa (2017) analyzed how agents in the banking entities are linked with performance in financial dimensions where it was shown that the adoption of the agency model of banking can enhance the performance of the bank through cost reduction efforts. Kandie (2011) focused on accessibility to agency services and how it supports the ability of the banks to perform financially where it emerged that the use of agents and performance are interlinked. Mchembere and Jagongo (2017) conducted a study on agency banking and profitability and an inverse and significant link were noted. Musau and Jagongo (2015) used a case of Kenyan banks to provide the link between the need to utilize agency banking and the performance of bans where it was shared that the use of agents was significantly linked with financial performance. A study was conducted in Tanzania by Mwasakabeto (2020) whose focus was on linking agency banking and performance where a direct and significant link was registered between agency banking and performance. The study conducted in Uganda by Nimwesiga (2019) focused on agency banking and performance of banking entities and obtained mixed results such that access to banking services and customer transaction were significant, cost of service through agents was not significant.

Regression Results and Hypotheses Testing

This section presented the findings of regression analysis

Financial Innovation and Financial Performance

The effect of financial innovation on financial performance was explored through regression analysis. Table 2 gives the findings of the model summary.

Table 2: Model Summary of Financial Innovation and Financial Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.894[a]	.800	.792	.01701

Source: Research Data (2021)

Table 2 gives the value of R square as .800, which is interpreted to imply that 80% change in financial performance of tier III commercial banks in Kenya is explained by financial innovations in place. This means that aside from these financial innovations, there are still other factors with far reaching implication on financial performance that future studies should seek to establish. The findings of the ANOVA were determined and summarized as indicated in Table 3.

Table 3: ANOVA for Financial Innovation and Financial Performance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.116	4	.029	99.828	.000[b]
Residual	.029	100	.000		
Total	**.144**	**104**			

The value of F calculated from Table 3 is given as 99.828 with a p-value $p<0.05$. This means that the overall regression model of the study was generally significant. Table 4 gives the findings of the beta coefficients and significance.

Table 4: Regression Beta Coefficients and Significance

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.030	.004		6.929	.000
Internet Banking	.248	.013	.930	18.653	.000
Agency Banking	.110	.028	.198	3.974	.000

Table 4 showed that internet banking (β=.248, $p<0.05$) had the greatest significant effect on financial performance. This finding is supported by Chung and Dutta (2012) who observed that e-banking contribute towards reduction in costs which allow banks to generate sufficient profits. Mateka, Gogo and Omagwa (2016) showed that internet banking has significant link with financial performance. Atavachi, (2013) noted that internet and other technologies have supported and enhanced performance of the MFIs. Using a case of Nigeria, Madugba, Egbide, Jossy, Agburuga and Chibunna (2021) did an investigation on e-banking and its link with financial performance of banks and noted that ATMs have a direct and significant connection with ROA and ROE. Among commercial banks in India, Sidhu (2018) did an analysis of internet banking and performance where it was shown that internet banking helps banking entities to drive their performance in terms of ROA and ROE.

Agency banking (β=.110, $p<0.05$) had the second greatest significant effect on financial performance. The finding is in line with Veniard *et.al* (2010) who noted that use of agents allows banking entities to perform in a better way. Mbugua and Omagwa (2017) revealed that adoption of agency model of banking can enhance performance of the bank through cost reduction efforts. Kandie (2011) shared that use of agents and performance are interlinked. On the contrary, Mchembere and Jagongo (2017) noted existence of an inverse and significant link between agency banking and profitability. Musau and Jagongo (2015) shared that use of agents was significantly linked with FP. The

findings contradict with Ndambuki (2015) who noted that agency banking has no significant link with profitability. A study was conducted in Tanzania by Mwasakabeto (2020) whose focus was on linking agency banking and performance where a direct and significant link was registered between agency banking and performance. The study conducted in Uganda by Nimwesiga (2019) focused on agency banking and performance of banking entities and obtained mixed results such that access to banking services and customer transaction were significant, cost of service through agents was not significant.

Test for Moderation of CBK Regulation

The moderating variable used in this study was CBK regulation and it was represented by capital adequacy and credit risk regulation. The composite figure was determined.

Table 5: Model Summary for Moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.886[a]	.784	.782	.01739	.784	374.714	1	103	.000
2	.968[b]	.936	.935	.00949	.152	243.780	1	102	.000
3	.968[c]	.937	.935	.00950	.000	.722	1	101	.398

a. Predictors: (Constant), Financial Innovations

b. Predictors: (Constant), Financial Innovations, CBK Regulation

c. Predictors: (Constant), Financial Innovations, CBK Regulation, Interaction term

Source: Reseach Data (2021)

Table 5 gives the three models expressing the relationship between financial innovation, CBK regulation and financial performance. From the findings, model 1 shows that financial innovation account for 78.4% of financial performance among tier III banks. Model 2 indicate that financial innovation and CBK regulation account for 93.6% in financial performance among tier III banks. The introduction of the interaction term in model 3 led to an R square of 93.5.%. There is a change in R square in models 2 and 3 which represent the moderating effect of CBK regulation. Table 6 gives the ANOVA findings.

Table 6: ANOVA Findings for Moderation of CBK Regulation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.113	1	.113	374.714	.000[b]
	Residual	.031	103	.000		
	Total	**.144**	**104**			
2	Regression	.135	2	.068	750.865	.000[c]
	Residual	.009	102	.000		
	Total	**.144**	**104**			
3	Regression	.135	3	.045	499.453	.000[d]
	Residual	.009	101	.000		
	Total	**.144**	**104**			

a. Dependent Variable: ROA

b. Predictors: (Constant), Financial Innovations

c. Predictors: (Constant), Financial Innovations, CBK Regulation

d. Predictors: (Constant), Financial Innovations, CBK Regulation, Interaction term

Source: Research Data (2021)

From Table 6, the value of F calculated for models 1, 2 and 3 are 374.714, 750.865 and 499.453 respectively with the respective p-values being less than 0.05. This implies that the overall regression models were all significant. Table 7 provides an overview of the beta coefficients and significance.

Table 7: Coefficients and Significance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.001	.004		.309	.758
	Financial Innovations	.363	.019	.886	19.358	.000
2	(Constant)	.047	.004		13.248	.000
	Financial Innovations	.247	.013	.602	19.513	.000
	CBK Regulation	.239	.015	.482	15.613	.000
3	(Constant)	.046	.004		13.040	.000
	Financial Innovations	.247	.013	.603	19.499	.000
	CBK Regulation	.239	.015	.482	15.588	.000
	Interaction term	.007	.008	.021	.850	.398

a. Dependent Variable: ROA

Table 7 showed that the three models that were important in testing for moderation. Model 2 is when the CBK regulation have been introduced and the p-value is 0.000 ($p<0.05$). Model 3 include the interaction term whose-value was 0.398 ($p>0.05$). This means that there is partial mediation of CBK regulation in the relationship between financial innovation and financial performance. The finding is supported by Nyakarimi, Kariuki and Kariuki (2019) where regulations of the government were seen to significantly moderate the link between internal systems of control and prevention of fraud among banking entities. Wasike (2017) shared the established financial regulations moderate the link between corporate governance and ability of the entity to perform. Kimani *et al.* (2015) shared that regulations by the government were significant moderators. Kaloki (2018) noted that CBK regulation have a significant link with the ability of commercial banks to perform in financial terms. Mwongeli (2016) demonstrated a direct and significant link between financial regulations and financial inclusion. Muturi (2019) established a significant link between government regulations as a moderator indicator of the variable. Leveraging data from 23 industrial countries from 1975 to 1999, Copelovitch and Singer (2008) did explore the interplay between financial regulations, monetary policies and inflationary pressure and noted that central banks that have the responnsbility of regulating banks will be keen towards stability and profitability of the banking entities. In Asia, Akhtar, Lorie and Petersend (2009) analyzed the effectiveness demonstrated by central banks as far as financial crisis are concerned where it was shown that central babnks formulate regulations that influence stability of banks in general. Relying onm data from 71 nations and 857 banking entities, Pasiouras, Gaganis and Zopounidis (2006) analyzed bank regulation, structure of the market, supervision and rating of and study showed that regulations are key for soundness of the financial sector.

CONCLUSION AND RECOMMENDATIONS

Internet banking had the greatest significant effect on financial performance. Agency banking had a weak but positive relationship with financial performance. Agency banking had the second greatest significant effect on financial performance. CBK regulation has a moderate and positive relationship with financial performance. There was partial mediation of CBK regulation in the

relationship between financial innovation and financial performance.

The ICT managers of the tier III commercial banks in Kenya should partner with telecommunication companies like Safaricom and Airtel so as to subsidize the costs of accessing banking services through the internet

The direct sales representatives of the tier III commercial banks in Kenya should increase marketing efforts of agency banking so as to significantly contribute to financial performance.

The policy makers at the CBK should formulate stable capital adequacy and credit risk management policies that will support adoption of financial innovations among tier III commercial banks in Kenya

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