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EFFECT OF FINANCIAL INNOVATION ON FINANCIAL PERFORMANCE IN COMMERCIAL BANKS IN KENYA

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ABSTRACT

The main objective of this study was to establish the effect of financial innovation on financial performance of commercial banks in Kenya. The specific objectives were: to determine the effect of financial process innovation on the financial performance of commercial banks in Kenya; to evaluate the effect of financial market innovation on the financial performance of commercial banks in Kenya; to assess the effect of financial product innovation on the financial performance of commercial banks in Kenya and to ascertain the effect of financial institution innovation on the financial performance of commercial banks in Kenya. Descriptive survey was used while a questionnaire was used for the collection of primary data. Secondary data were used to verify the communicative and pragmatic validity of primary data. The target study units for this research were 126 randomly selected commercial bank senior management staff. Descriptive statistics, Pearson correlation and multiple regression analysis approaches were used. Statistical analysis was carried out with the aid of the IBM SPSS Statistics for Windows, version 23. The study findings revealed that financial institution innovation had a significant positive effect on financial performance of commercial banks in Mombasa County. Additionally, financial product innovation had a significant positive effect on financial performance of commercial banks in Mombasa County. The findings indicated that financial process innovation and financial market innovation also had significant effect on financial performance of commercial banks in Mombasa County. Through the findings of this study, the Government of Kenya would be able to assess which areas of innovation will support the banking sector by either waiving taxes or other non-monetary incentives. The findings of the study would also help banks determine the value of financial innovation in their success in terms of improving profitability. Commercial banks in Africa would also learn from this study in Kenya and understand the innovations they can replicate in their businesses in order to improve their performance. For scholars and researchers, the study adds value to the existing body of knowledge as it proposed ways to improve financial performance by exploiting technology innovations. This study served as a stepping stone for newer studies into financial innovation.

Key Words: *Financial Process, Financial Market, Financial Product, Financial Institution, Financial Performance*

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INTRODUCTION

Innovations in Information Communication and Technology (ICT) have revolutionized the financial industry, resulting in new distribution platforms for financial goods and services such as Automatic Teller Machines (ATMs), cell phone banking , internet banking, and agency banking (Schueffel & Vadana, 2015). These ICT-based technologies are referred to as electronic banking (e-banking) and is a sub-component of electronic commerce (e-commerce). E-banking has been influential in enhancing the level of service and financial efficiency of banks. Branchless banking, the use of alternate distribution platforms such as cell phone banking and agent banking, is becoming increasingly common with commercial banks in Kenya and other developing countries (Gichungu & Oloko, 2015). It is assumed that they would hit low-income and rural people as well as make them better off.

Goddard *et al*. (2017) examined the effect of Internet banking on the profitability of banks in Turkey. The researchers estimated the influence of online banking activities on the three important determinants of bank results, namely asset returns, stock returns and returns on the financial intermediation margin. They found that, in addition to investing in e-banking being an incremental process, the Internet banking variable had a positive impact on the success of Turkey's banking system in terms of returns to equity after just two years.

In Kenya, the successful use of information technology [IT] has contributed to greater use of employees and organization's assets, improved sales and expanded access to financial services by the general public (Mwania & Muganda, 2011). Ndung'u (2011) agrees that in just four years (2007-2011) of the existence of mobile phone money transfer services in Kenya, four mobile phone operators have 15.4 million customers and more than 39,449 agents in place. Total transactions in 2010 averaged Ksh. 2.45 billion per day and Ksh. 76 billion per month resulting in lower transaction costs and increased access to financial services. This give a picture of a very productive market for electronic money transfers (Ndung'u, 2011).

On 30 June 2011, the Kenyan banking sector consisted of 43 commercial banks, 1 mortgage finance agency, 6 deposit-taking microfinance institutions, 2 credit comparison offices, 3 representative offices and 124 foreign exchange offices (CBK, 2011). The financial sector in Kenya has experienced enormous improvements over the last two decades (1990-2010). For example, Misati, Njoroge, Kamau and Ouma (2017) document that financial goods have increased, that operations and operational structures have also improved and that the overall performance of the financial sector has increased (CBK, 2011). The commercial banks branch network grew from 530 in 1999 to 1,102 branches by the end of June 2011, the ATMs rose from 262 to 2,021, the number of deposit accounts from approximately 1 million with 16,673 employees to 12.8 million with 28,846 employees during the same time (CBK, 2011). As a result, the efficiency ranking for the banking sector continued to increase, with a staff-to-customer ratio of 1:444 in June 2011 compared to 1:60 in 1999. Total assets have risen from Ksh. 387,371 million to Ksh 1.9 trillion between December 1999 and June 2011, whereas consumer deposits increased to Ksh. 1.4 trillion from Ksh. 235 billion within the same period (CBK, 2011).

The growth of the financial sector in Kenya can be reviewed in three phases (Misati *et al*., 2017). The first step is from the 1970s to the early 1980s. At that time, the finance market was largely dominated by the banking industry, which was marked by financial repression. The government played a central role in the allocation of credit to investment through the use of direct monetary policy measures such as interest rate caps, exchange rate limits and the allocation of credit to target sectors, among other regulatory constraints (Misati *et al*., 2017). The second period started with the introduction of institutional reform programs and liberalization initiatives in the late 1980s and

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early 1990s. Relaxation of interest rate, exchange rate and management of capital markets has been observed during this time. The aim of the financial sector reforms this period was to cause narrow spreads in interest rates, increase the supply of financial capital by increased liquidity, improve the efficiency of credit distribution and increase investment.

According to the 2011-2012 Global Competitiveness Index (GCI) survey, Kenya ranked 102 out of the 142 countries with an overall ranking of 3.8 out of a maximum of 7 making Kenya among the top 50 in terms of global competitiveness. Kenya's creative potential is ranked 52nd, with strong corporate investment on research and development (R&D) and a successful basic research institution collaborating well with the business sector in research activities. The economy is also driven by capital markets well-developed by international standards (26th position) showing the capacity for development of the Kenyan banking industry and a reasonably healthy labor market (37th position) (WEF, 2011).

The banking sector has been committed as a core pillar to achieving the 2030 vision (a long-term plan to achieve economic development by 2030) by growing deposits, attracting foreign direct investment (FDI), safeguarding the economy from external shocks and pushing Kenya to become the leading financial hub in Eastern and Southern Africa. Under the Medium Term Strategy (2008-2012) of the 2030 project, some of the focus areas include the implementation of a stable and efficient payment mechanism that will ensure seamless transfer and settlement of funds between clients and customers as well as between customers. To this end, the use of cell phone networks, the internet, payment cards, technological stability and protection will be sought in order to improve confidence, credibility and faith in ICT-based payment mechanisms (Government of Kenya, 2008). In contrast with other East African economies, Kenya's banking sector has been praised with its growth and diversification for several years. Private credit to GDP, the typical proxy for financial growth, was 23.7% in 2008, compared to a median of 12.3% in sub-Saharan Africa. On the basis of the same metric, Kenya is ahead of Tanzania with 12.3 per cent and Uganda with 7.2 per cent (Beck, Demirguc-Kunt & Levine, 2019).

Statement of the Problem

Despite the obvious value of financial innovation in describing banking performance, the effect of innovation on performance is still confused for two major reasons: first, lack of awareness of the generators of innovation; and second, the influence of innovation on bank performance remains untested (Mabrouk & Mamoghli, 2017). A research by De Young *et al*. (2017) adopts an approach to innovation performance relations that does not take into consideration the antecedents of innovation inside and outside banking institutions, both of which may affect this relationship.

Previous studies such as Franscesa and Claeys (2017), Batiz-Lazo and Woldesenbet (2016) and Mwania and Muganda (2018) have provided mixed findings on the effect of financial innovations on bank performance. In their report, Franscesa and Claeys (2017) concluded that financial innovation had the least impact on bank performance, while Batiz-Lazo and Woldesenbet (2016) and Mwania and Muganda (2018) concluded that financial innovation had a substantial contribution on bank results. It is at the core of such mixed results that it has generated and necessitated the need to carry out an analysis from the Kenyan perspective in order to determine the influence of bank developments on the efficiency of commercial banks.

Kenyan commercial banks have started to spend extensively in technology-based creativity and staff preparation in the handling of emerging innovations. Data from Central Bank of Kenya (2011) show that the number of automated teller machines increased from 166 in 2001 to 2091 in 2010, the number of debit cards increased from

160,000 in 2001 to more than 6 million by the end of 2010, while mobile banking transactions increased from 48,000 per year in 2007 to more than 250,000 transactions per year in 2010. The performance of commercial banks in Kenya has improved significantly between 2001 and 2010, with income before tax increasing from Kshs. 2.7 billion in 2001 to Kshs. 74 billion in 2010. Over the same period , total profits increased from Ksh 61 billion to Ksh 178 billion, while total assets increased from Ksh 425 billion to Ksh 1.7 trillion (CBK, 2011). The relationship between increasing investment in technology-based banking technologies and bank financial performance in Kenya needs to be examined. It is important to assess if developments have added to the financial results of commercial banks in Kenya.

In their study on the consequences of financial innovations, Lerner and Tufano (2017) argue that existing empirical evidence and conceptual frameworks can tell more about financial innovation, but there are major unanswered questions in the areas of the social welfare impact of financial innovations, the impact of innovations on financial institutions and a lot of financial innovation research is mainly on case studies. Carbo, Paso and Rodriguez-Fernandez (2017) studied the impact of developments and innovations in the regional banking sector in Spain between 1986 and 2001. The study found that innovations in product and service delivery make a positive contribution to the regional Gross Domestic Product (GDP), investment and gross savings growth. These sentiments are shared by Hendrickson and Nichols (2017), while studying the performance of small banks in the United States with regard to interstate branching and finding that banks perform better when they adopt innovations across their various branches. On the basis of these studies and the varying gaps in literature, similar studies need to be conducted in Africa and more so in Kenya where bank innovations have been on the rise in the past decade.

Objectives of the Study

The general objective of this study was to examine the effect of financial innovation on financial performance in commercial banks in Kenya. The specific objectives were;

- To determine the effect of financial process innovation on the financial performance in commercial banks in Kenya.
- To ascertain the effect of financial institution innovation on the financial performance in commercial banks in Kenya.
- To assess the effect of financial product innovation on the financial performance in commercial banks in Kenya.
- To evaluate the effect of financial market innovation on the financial performance in commercial banks in Kenya.

The study was guided by the following research hypotheses;

- H_{o1}: Financial process innovation has no significant effect on the financial performance in commercial banks in Kenya
- H_{o2}: Financial institution innovation has no significant effect on the financial performance in commercial banks in Kenya
- H_{o3}: Financial product innovation has no significant effect on the financial performance in commercial banks in Kenya
- H_{o4}: Financial market innovation has no significant effect on the financial performance in commercial banks in Kenya

LITERATURE REVIEW

Transaction Cost Innovation Theory

Hicks and Niehans (1983) introduced the Transaction Cost Innovation Theory, which postulates that transaction cost savings and earnings gains are the primary explanation for financial innovation. The theory explores the relationship between the elimination in transaction costs and technological innovations. According to the theory, financial innovation is catalyzed by technology advancement which cause transaction cost to reduce and better financial performance. A transaction cost is a cost that is incurred in the

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exchange of a good or service. According to Hicks and Niehans (1983), transaction costs vary. These include quality of service or products, reliability, contact fees, legal fees, price finding information and travel costs. According to this hypothesis, the answer to technological advancements is the prevailing force in financial innovation. This causes the transaction cost to reduce. Consequently, the cost reductions stimulate financial innovation as well as efficiency in service delivery. Juhakam (2013) describes the theory of cost reduction as a driver of financial innovation. He cites examples as reduction from improvements in payments, processing or reduction resulting from new ways meant to deliver services electronically to customers. However, regulatory restrictions and requirements are also a cost and some innovations are aimed at avoiding or reducing that cost.

Circumvention Innovation Theory

The circumvention innovation theory was pioneered by the American economist Kane in 1981. Kane (1981) argued that certain forms of government oversight and control, which have the same tacit tax assets, undermine the company's economic activity and the opportunity to make a profit. Market innovation and regulatory innovation should therefore be seen as a continuous process of struggle between independent economic strength and political strength. Because the financial sector is special, it has stricter regulations. Financial institutions are dealing with a situation such as the reduction of profits and the failure of governance induced by government regulations to reduce the potential loss to the minimum. As a result, financial innovation is mostly driven by the aim of earning a profit and by circumventing government regulations.

Constraint Induced Financial Innovation Theory

This theory was advanced by an American Economist Silber. Silber (1983) attributes financial innovations to attempts by profit maximizing firms to reduce the impact of various types of constraints that reduces profitability. He defines a constraint as something that limits or restricts progress. According to Silber (1983), the main reason for financial innovation is profit maximization. However, in the process of pursuing profit maximization, financial institutions tend to face some restrictions which are either external or internal. These constraints can either be self-imposed, market imposed or government imposed. Silber (1983) views a financial firm as a utility maximizing entity which operates in a given environment constrained by some set of internal rules, set of macroeconomic conditions in a given regulatory environment, set of tax laws and given levels of technology and knowledge. Although these restrictions not only guarantee the stability of management they reduce the efficiency of financial institutions so the institutions strive to cast them off.

Market Efficiency Theory of Innovation

The market efficiency theory of innovation was pioneered by Robert Merton. The theory is based on the notion that financial innovations are motivated by forces designed to increase market efficiency and improve social welfare. Merton (1992) argued that the market is not perfect hence financial institutions must innovate to improve market efficiency. According to Dabrowski (2017) financial economists generally view the flow of funds to take advantage of investment opportunities and financial innovations as positive forces that makes markets more efficient, facilitate risk sharing and increase growth. Merton (1992) gives three motivations for producing innovations namely, the creation of new financial structures that allow risk sharing, risk pooling and hedging as well as new financial structures for transferring resources, the improvement of economic efficiency and liquidity and reduction of agency costs.

Balanced Scorecard Theory

The Balanced Scorecard (BSC) is a mutually supportive performance indicator that aligns the strategies of organizations without concentrating on one field of operation at the detriment of another (Malgwi & Dahiru, 2014). The BSC

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combines performance measures which are both qualitative and quantitative. Kaplan and Norton (2016) suggest that the balanced scorecard is an advantage of measures that provide top managers with a speedy and complete business perspective and complement financial-related estimates that tell the after-effects of past activities, with operational estimates that drive future financial results.

Ibrahim (2015) argues that from four viewpoints the BSC tests business performance. There is the financial viewpoint that has the financial metrics to determine how the company looks to shareholders, including ROI, cash flows, corporate profitability, sales backlog and income forecasting. The customer perspective helps determine the performance of the company in the customer's eyes and includes analysis of consumer ranking, customer satisfaction, market share and price index. The third point of view is the expected operating metrics that are used to determine how well the organization is doing in the business processes that have an impact on customer service. The last viewpoint is innovation and learning, which assesses whether the organization is continually improving, including revenue per employee, percentage of income from new service, rate of progress index, employee attitude survey, and or number of recommendations for employees.

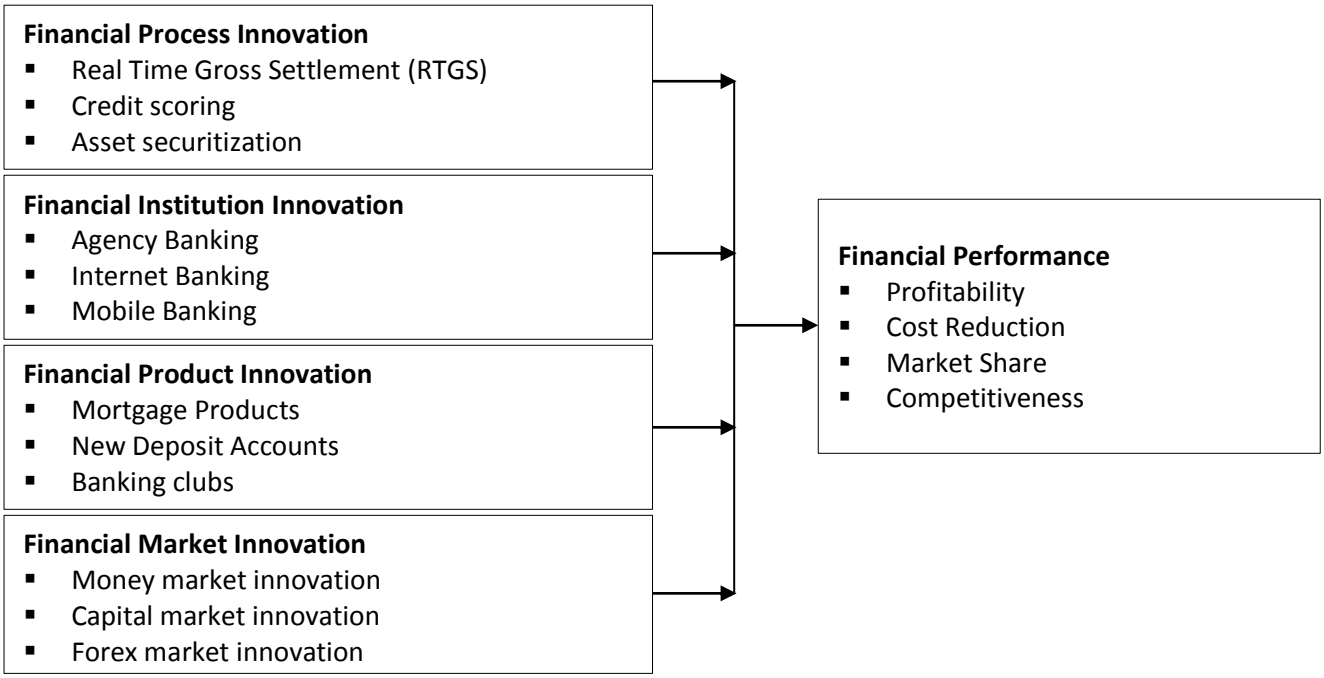

Figure 1: Conceptual Framework

Empirical Review

El-Chaarani and El-Abiad (2018) examined the impact of technological innovation factors on the performance of Lebanese banks during an eight-year period from 2010 to 2017. The study employed return on assets (ROA) and return on equity (ROE) as proxies to measure performance level. The technological innovation factors included internet banking, mobile banking, automated teller machines and investment in computer software. The findings indicated that investment in automated teller machines (ATMs) and internet banking had significant positive impact on the performance of Lebanese banks. The results also revealed non-significant impact of mobile banking and investments in computer software on the performance of Lebanese banks.

Tabas, Beranová and Martinovičová (2012) sought to determine possible effect of product innovations

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on the financial performance of small and medium-sized enterprises in the Czech Republic. From the results of their pilot study of statistical sample of 100 companies, it was evident that continuous innovations are necessary. In his study on determinants of financial innovation and its effects on bank performance in Kenya, using exploratory research design on a sample of 43 commercial banks in Kenya for a six year period from 2002-2007.

A study by Gunday, Ulusoy, Kilic and Alpkan (2011) on the effects of innovations on firms' performance, sought to explore the effect of the organizational, process, product and marketing innovations on the different aspects of firms performance including innovative, production, market and financial performances, based on an empirical study covering 184 manufacturing firms in Turkey. The results revealed positive effects of innovations on firm performance in manufacturing industries.

Jingqin, Ying, Kaodui and Osei-Assibey (2019) examined the impacts of financial innovation on banks profitability performance by means of electronic banking services in Africa from the period of 2015-2018. The study employed the dynamic panel data method and GMM estimations via a panel data regression model. The findings revealed that there is a strong persistence in a reliable manner for both ROA and ROE. The results further showed that bank cards and ATM have a positive effect on banks financial performances with the exception of POS terminal and internet banking. Additionally, the profitability of most African developing countries affected the percentage number of ATMs to the number of branches and is highly important.

Nkem and Akujinma (2017) evaluated the relationship between financial innovation and bank efficiency as well as the impact of financial innovation on efficiency ratio of deposit money banks in Nigeria from 2006 to 2014. Data covering the period of the study were sourced from the Central Bank of Nigeria statistical bulletin. The unit root test was performed to ensure that the variables were free from stationarity defect linked with almost all time series data due to the nature they were generated. A multiple regression model was developed and estimated to evaluate the relationship among the variables concerned. The finding revealed that the value of transaction on Automated Teller Machine (ATM) and Point of Sale (POS) were negatively related with efficiency ratio while web/internet and mobile banking are positively related but only that of web/internet was significantly related. The granger impact assessment depicted that financial innovation products reflected by value of transaction on ATMs, web/internet, POS and mobile banking had no significant impact on efficiency ratio of deposit money banks in Nigeria. However, the study found evidence that banks efficiency ratio exerted statistically significant impact on value of transactions on ATMs.

Okonkwo, Obinozie and Echekoba (2015) examined the impact of Information and Communication Technology and financial innovation on the performance of commercial banks. Using annual data of conveniently selected eleven Commercial Banks in Nigeria and Central Bank of Nigeria facts book over the period 2001 to 2013, the study applied ordinary least square to ascertain the impact of E-Banking services and ATMs on the performance of the commercial banks. The findings of the study indicated that investments in E-banking services and ATMs do not have a significant impact on commercial banks' performance.

Ndwiga and Maina (2018) assessed the effect of product innovation and process innovation on financial performance of listed commercial banks in Kenya. Data was collected using Qualtrics Survey Software with which online questionnaires were administered to the respondents. Collected data was analyzed using multiple linear regression to determine the relationship between the variables. The findings indicated that process innovation had a significant positive effect on financial performance of listed commercial banks. However, product

innovation showed no significant relationship with financial performance.

Nekesa and Olweny (2018) investigated the effects of financial innovation on financial performance of deposit-taking SACCOs in Kajiado County. In particular, the study evaluated the effect of product, process and organizational innovations on financial performance of deposit-taking SACCOs. The study adopted a descriptive research design and collected data from 36 respondents of two SACCOs. Secondary data was obtained from annual reports, libraries and the SACCO databases. Data was analyzed using multiple linear regression to establish the relationship between the variables. It was established that product, process and organizational innovations had statistically significant effect on financial performance of deposit-taking SACCOs. The study concluded that financial innovation significantly influences the performance of the financial status of deposit-taking SACCOs in Kajiado County.

Sum and Memba (2016) examined the effect of financial innovation on the financial performance of deposit taking SACCO's in Kiambu County. More specifically, the study analyzed the role of product, process, service and institutional innovations in the performance of SACCO's. Data was obtained from 11 SACCO's and analyzed using multiple linear regression. The findings indicated that product, process, service and institutional innovations had statistically significant effect on financial performance of SACCOs in Kenya. The study concluded that financial innovation has a significant influence on financial performance of SACCO's.

Using correlational research design, Kamau and Oluoch (2016) examined the causal effect of financial innovation on performance of commercial banks. The study sought to determine the contribution of mobile, internet, ATM, credit cards, and agency banking on banks' performance. Correlation and regression analysis were conducted using data from published annual reports of 11 commercial banks in Kenya for the period 2012-2015, to determine the relationship between the variables. The findings indicated that ATM, mobile banking, use of credit and debit cards, internet banking and agency banking all have significant positive influence on commercial banks performance in Kenya.

Gichungu and Oloko (2015) adopted a descriptive research design to establish the relationship between bank innovations and financial performance of Commercial Banks in Kenya. The study specifically sought to establish the effect of mobile phone banking, ATM banking, online banking and agency banking on the financial performance of commercial banks in Kenya. Using data from published annual reports of 43 commercial banks for the period 2009-2013, Pearson correlation and multiple regression analysis was used to test the relationship between bank innovations and financial performance of the commercial banks. The study established that the identified bank innovations, precisely, mobile phone banking, online banking, agency banking and ATM banking had positively impacted on the financial performance of commercial banks in Kenya over the 5 year period between 2009 and 2013. The study concluded that financial innovations have a significant positive effect on financial performance of commercial banks.

METHODOLOGY

This study used descriptive survey research design. The target population for this study were senior management staff of 42 licensed commercial banks in service in Mombasa County as of 30 June 2017, as seen in the Central Bank of Kenya database. The sampling frame for this analysis consisted of all approved commercial banks in service in Mombasa County as of June 2017. A stratified random sampling technique was employed to select the respondents who were stratified based on the various employment levels in the organization. The study used questionnaires to obtain qualitative data for analysis which was further validated from analysis results from secondary data quantitative analysis. Primary data was collected through the

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administration of questionnaires to senior management bank employees. Secondary data was obtained from the Central Bank of Kenya, Kenya National Bureau of Statistics and the Banking survey manuals. The data obtained from the questionnaires was edited and then coded for the purposes of data analysis. It was further summarized using descriptive statistics which usually include measure of central tendency, such as the mean. Statistical Package for Social Sciences (SPSS v24) was used for analysis. Analysis of Variance and multiple linear regression analysis was computed to determine the statistical relationship between the independent variable and the dependent variables. The regression model was as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y = Financial performance

α = Constant Term

β_1, β_2, β_3 and β_4 = Coefficients of the independent variables

X_1= Financial process innovation

X_2= Financial institution innovation

X_3= Financial product innovation

X_4= Financial market innovation

ε = Error term

RESULTS AND DISCUSSIONS

Descriptive Analysis

In the research analysis the researcher used a tool rating scale of 5 to 1; where 5 were the highest and 1 the lowest. Opinions given by the respondents were rated as follows, 5= Strongly Agree, 4= Agree, 3= Neutral, 2= Disagree and 1= Strongly Disagree. The analyses for mean, standard deviation was based on this rating scale. The width of every point in the scale is 0.8 [(5-1) ÷ 5], therefore, 1 to 1.8 depicted strongly disagree, 1.81 to 2.6 disagree, 2.61 to 3.4 neutral, 3.41 to 4.2 agree, and 4.21 to 5 strongly agree.

Financial Process Innovation

The first objective of the study was to analyze the effects of financial process advancement on the financial performance of commercial banks in Mombasa County. The argument that asset securitization increases profitability had an average score of 3.13 and a standard deviation of 1.530. The argument that the securitization of assets raises the capital adequacy had a mean score of 3.56 and a standard deviation of 1.537. The argument that risk control techniques protect the interests of companies had a mean score of 3.54 and a standard deviation of 1.307. The argument that risk control improves the return on investment had a mean score of 3.80 and a standard deviation of 1.499. The argument that RTGS raises consumer deposits had a mean score of 3.13 and a standard deviation of 1.424. Table 1 presented the results.

Table 1: Financial Process Innovation

	N	Min	Max	Mean	Std. Dev.
Asset securitization improves profitability	71	1	5	3.13	1.530
Asset securitization increases capital adequacy	71	1	5	3.56	1.537
Risk management strategies safeguards entities assets	71	1	5	3.54	1.307
Risk management increases return on investments	71	1	5	3.80	1.499
RTGs increase customer deposits	71	1	5	3.13	1.424

Financial Institution Innovation

The second objective of the study was to analyze the effects of innovation in financial institutions on the financial performance of commercial banks in Mombasa Region. The argument that agency banking increases performance had an average score of 3.70 and a standard deviation of 1.525. The argument that organization banking raises consumer deposits has an average score of 3.49 and a standard deviation of 1.585. The argument that

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Internet banking boosts customer loyalty had a mean score of 3.49 and a standard deviation of 1.433. The argument that internet banking reduces running costs had a mean score of 3.62 and a standard deviation of 1.598. The argument that Internet banking raises investment returns had a mean score of 3.66 and a standard deviation of 1.539. The argument that mobile banking increases service quality had an average score of 3.32 and a standard deviation of 1.481. The argument that the credit reference bureau increases performance had a mean score of 3.56 and a standard deviation of 1.818. The outcome was shown in table 2.

Table 2: Financial Institution Innovation

	N	Min	Max	Mean	Std. Dev.
Agency banking improves efficiency	71	1	5	3.70	1.525
Agency banking increases customer deposits	71	1	5	3.49	1.585
Internet banking increases customer satisfaction	71	1	5	3.49	1.433
Internet banking lowers operation costs	71	1	5	3.62	1.598
Internet banking increases returns on investment	71	1	5	3.66	1.539
Mobile banking improves service delivery	71	1	5	3.32	1.481
Credit reference bureau enhances efficiency	71	1	5	3.56	1.818

Financial Product Innovation

The third objective of the study was to analyze the effects of financial product advancement on the financial performance of commercial banks in Mombasa Region. The argument that mortgage developments boost customer deposits had a mean score of 3.04 and a standard deviation of 1.507. The argument that mortgage innovations increases performance had a mean score of 4.01 and a standard deviation of 1.498. The argument that new bank accounts boost performance had a mean score of 3.14 and a standard deviation of 3.52 and a standard deviation of 1.701. The argument that profits from ATMs improved profitability had a mean score of 3.25 and a standard deviation of 1.548. The argument that banking clubs increase consumer deposits had a mean score of 3.25 and a standard deviation of 1.654. The argument that banking clubs increase productivity had a mean ranking of 3.58 and a standard deviation of 1.583. The findings were described in table 3.

Table 3: Financial Product Innovation

	N	Min	Max	Mean	Std. Dev.
Mortgage innovations improve customer deposits	71	1	5	3.04	1.507
Mortgage innovations improves profitability	71	1	5	4.01	1.498
New deposit accounts improve efficiency	71	1	5	3.14	1.701
ATMs incomes increases profitability	71	1	5	3.52	1.548
Banking clubs improves customer deposits	71	1	5	3.25	1.654
Banking clubs enhances efficiency	71	1	5	3.58	1.583

Financial Market Innovation

The fourth objective of the study was to examine the impact of financial market innovation on the financial performance of commercial banks in Mombasa County. The argument that money market innovations increases performance had a mean score of 3.58 and a standard deviation of 1.349. The argument in consensus that capital market developments increase returns on investment had a mean score of 4.10 and a standard deviation of 1.446. The argument that foreign exchange sector advances boost capital adequacy had a mean score of 4.25 and a standard deviation of 1.143. The findings were described in table 4.

Table 4: Financial Market Innovation

	N	Min	Max	Mean	Std. Dev.
Money market innovations improves profitability	71	1	5	3.58	1.349
Capital market innovations improves return on investment	71	1	5	4.10	1.446
Foreign exchange market innovations enhance capital adequacy	71	1	5	4.25	1.143

Financial Performance

The argument that financial advances minimize running costs had a mean score of 3.79 and a standard deviation of 1.706. The argument that financial advances improve performance had a mean score of 3.54 and a standard deviation of 1.620. The argument that financial advances had increased productivity had a mean ranking of 3.77 and a standard deviation of 1.495. The argument that financial developments raised the market share of commercial banks had a mean score of 3.82 and a standard deviation of 1.447. The argument that financial developments would fasten every financial activity had a mean score of 3.94 and a standard deviation of 1.145. The argument that financial developments had a lower financial risk had a mean score of 3.75 and a standard deviation of 1.519. The argument that financial developments enhanced service quality had a mean score of 4.23 and a standard deviation of 1,532. The argument that financial advances increased customer loyalty had a mean score of 3.42 and a standard deviation of 1,555. The findings were presented in table 5.

Table 5: Financial Performance

	N	Min	Max	Mean	Std. Dev.
Financial innovations reduce costs of operations	71	1	5	3.79	1.706
Financial innovations increase profitability	71	1	5	3.54	1.620
Financial innovations have improved competitiveness	71	1	5	3.77	1.495
Financial innovations have increased the market share of the MFI	71	1	5	3.82	1.447
Financial innovations fasten any financial transaction	71	1	5	3.94	1.145
Financial innovations have lower financial risk	71	1	5	3.75	1.519
Financial innovations have improved service delivery	71	1	5	4.23	1.532
Financial innovations have improved the level of customer satisfaction	71	1	5	3.42	1.555

Correlation Analysis

In order to determine the relationship between the independent variables and the dependent variable, the thesis performed a correlation analysis involving the coefficient of correlation and the coefficient of determination. Pearson Bivariate Correlation Coefficient was used to measure the association between the dependent variable (Financial Performance) and the independent variables (Financial Process Innovation, Financial Institution Innovation, Financial Product Innovation and Financial Market Innovation). According to Sekaran and Bougie (2016), this relationship is considered to be linear and the correlation coefficient varies from -1.0 (perfect negative correlation) to +1.0 (perfect positive relationship).

In an attempt to explain the relationship between the research variables and their results, the research used the correlation coefficient (r) of Karl Pearson. It was evident from the results that there was an association between the independent variables, Financial Process Innovation, Financial Institution Innovation, Financial Product Innovation and Financial Market Innovation and the dependent variable financial performance. The study reveals the correlation coefficient, r equal to 0.412, 0.020, 0.663 and 0.383 for Financial Process Innovation, Financial Institution Innovation, Financial Product

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Innovation and Financial Market Innovation respectively. This indicates that financial performance had positive relationship with Financial Process Innovation, Financial Product Innovation, financial institutions innovation and Financial Market Innovation. Table 6 presented the results.

Table 6: Pearson Correlation

	Financial Performance	Financial Process Innovation	Financial Institution Innovation	Financial Product Innovation	Financial Market Innovation
Financial Performance	1				
	71				
Financial Process Innovation	.412**	1			
	.000				
	71	71			
Financial Institution Innovation	.020	.372**	1		
	.009	.001			
	71	71	71		
Financial Product Innovation	.662**	.455**	.197	1	
	.000	.000	.100		
	71	71	71	71	
Financial Market Innovation	.383**	.516**	.464**	.537**	1
	.001	.000	.000	.000	
	71	71	71	71	71

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

Regression Analysis

A confirmatory factor analysis was conducted to evaluate the research model. The four factors were then subjected to a linear regression analysis to measure the success of the model and predict the causal relationship between the independent variables (Financial Process Innovation, Financial Institution Innovation, Financial Product Innovation and Financial Market Innovation) and the dependent variable (Financial Performance).

Model Summary

The model explained 49.9% of the variance (Adjusted R Square = 0.469) on Financial Performance. Clearly, there are factors other than the four proposed in this model which can be used to predict financial sustainability. However, this is still a good model as Bryman and Bell, (2015) pointed out that as much as lower value R square 0.10-0.20 is acceptable in social science research. This means that 49.9% of the relationship is explained by the identified four factors namely Financial Process Innovation, Financial Institution Innovation, Financial Product Innovation and Financial Market Innovation. The rest 50.1% is explained by other factors in the financial performance not studied in this research. In summary the four factors studied namely, Financial Process Innovation, Financial Institution Innovation, Financial Product Innovation and Financial Market Innovation or determines 49.9% of the relationship while the rest 50.1% is explained or determined by other factors. Table 7 presents the results.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.706[a]	.499	.469	2.30063

a. Predictors: (Constant), Financial Market Innovation, Financial Institution Innovation, Financial Process Innovation, Financial Product Innovation

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ANOVA

The research used ANOVA to assess the significance of the regression test. When measuring the significance level, the statistical significance was deemed to be important if the p-value was less than or equal to 0.05. The findings revealed a p-value of 0.00 which was less than 0.05. This suggests that the regression model is statistically significant in forecasting financial performance factors. Centered on the 95 per cent confidence mark, the analysis shows high reliability of the results achieved. The overall results of ANOVA suggested that the model was significant at F = 16,442, p = 0.000.

Table 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	348.104	4	87.026	16.442	.000[b]
	Residual	349.333	66	5.293		
	Total	697.437	70			

a. Dependent Variable: Financial Performance

b. Predictors: (Constant), Financial Market Innovation, Financial Institution Innovation, Financial Process Innovation, Financial Product Innovation

Regression Coefficients

The researcher performed a multi-regression analysis to establish the association between the financial performance of commercial banks in Mombasa County and the four variables examined in this report. The findings showed that taking into account all considerations (Financial Performance of Commercial Banks in Mombasa County) constant zero financial performance of commercial banks in Mombasa County would be 20.792.

The findings also revealed that bringing all other independent variables to zero, a unit improvement in financial process innovation would lead to a 0.131 rise in the financial output scores of commercial banks in Mombasa County; a unit rise in financial institution innovation would lead to a 0.141 increase in the financial performance of commercial banks in Mombasa County; a unit improvement in financial product innovation would result in a 0.643 improvement in the financial performance of commercial banks in Mombasa County; and a unit rise in financial market innovation would lead to a 0.204 increase in the financial output of commercial banks in Mombasa County. The results showed that all predictors had a statistically meaningful impact on financial output with a p-value smaller than the relevant level of 0.05.

Table 9: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	20.792	5.605		3.709	.000
	Financial Process Innovation	.131	.071	.198	1.849	.049
	Financial Institution Innovation	.143	.058	.247	2.451	.017
	Financial Product Innovation	.643	.120	.573	5.341	.000
	Financial Market Innovation	.204	.276	.088	.740	.022

a. Dependent Variable: Financial Performance

The regression equation was:

$Y = 20.792 + 0.131X_1 + 0.143X_2 + 0.643X_3 + 0.204X_4$

Where;

Y = the dependent variable (Financial Performance)

X_1 = Financial Process Innovation
X_2 = Financial Institution Innovation
X_3 = Financial Product Innovation
X_4 = Financial Market Innovation

Hypotheses Testing

Based on the results of the regression coefficients the hypotheses of the study were tested at a significance level of alpha = 0.05. Table below presented the results.

Table 10: Test of Hypotheses

Hypotheses Statement	β	t	p-value	Decision
H_{01}: Financial process innovation has no significant effect on the financial performance of commercial banks in Kenya.	.131	1.849	.049	Reject H_{01}
H_{02}: Financial institution innovation has no significant effect on the financial performance of commercial banks in Kenya.	-.143	2.451	.017	Reject H_{02}
H_{03}: Financial product innovation has no significant effect on the financial performance of commercial banks in Kenya.	.643	5.341	.000	Reject H_{03}
H_{04}: Financial markets innovation has no significant effect on the financial performance of commercial banks in Kenya.	-.204	-0.740	.022	Reject H_{04}

Discussion of Findings

The first objective of the study was to examine the effect of financial process innovation on financial performance of commercial banks in Mombasa County. Based on the regression coefficient results (β_1 = 0.131, t = 1.849, p < 0.05), the study findings rejects the null hypothesis that financial process innovation has no significant effect on financial performance of commercial banks in Mombasa County. This implied that financial process innovations such as RTGS, credit scoring, and asset securitization have a significant contribution to the financial performance of commercial banks in Mombasa County. The results were consistent with the findings of Ndwiga and Maina (2018) which assessed the influence of product innovation and process innovation on the financial performance of listed commercial banks in Kenya. The results showed that process improvement had a substantial positive impact on the financial performance of listed commercial banks.

The second objective of the study was to examine the effect of financial institution innovation on financial performance of commercial banks in Mombasa County. Based on the regression coefficient results (β_2 = 0.143, t = 2.451, p < 0.05), the study findings rejected the null hypothesis that financial institution innovation has no significant effect on financial performance of commercial banks in Mombasa County. As a result, the study accepts the alternative hypothesis that financial institution innovation has a significant effect on financial performance of commercial banks in Mombasa County. This implied that financial institution innovations such as agency banking, internet banking, and mobile banking contributed to a 14.3% reduction in the financial performance of commercial banks in Mombasa County. These results are inconsistent with the findings of Sum and Memba (2016) and Nekesa and Olweny (2018), which investigated the influence of product, process, service and institution innovations on the financial performance of SACCOs in the Kiambu and Kajiado counties, respectively. The two studies revealed a statistically important positive impact on the creativity of financial institutions on financial performance of deposit-taking SACCOs.

The third objective of the study was to examine the effect of financial product innovation on financial performance of commercial banks in Mombasa County. Based on the regression coefficient results ($\beta_3 = 0.643$, $t = 5.341$, $p < 0.05$), the study findings rejects the null hypothesis that financial product innovation has no significant effect on financial performance of commercial banks in Mombasa County. Consequently, the study accepts the alternative hypothesis that financial product innovation has a significant effect on financial performance of commercial banks in Mombasa County. This implied that financial product innovations such as mortgage products, new deposit accounts, and banking clubs contributed to a 64.3% increase in the financial performance of commercial banks in Mombasa County. These results are consistent with the findings of Sum and Memba (2016) and Nekesa and Olweny (2018), which identified a statistically significant positive impact of financial product innovation on the financial performance of SACCOs. However, the findings differ from those of Ndwiga and Maina (2018) which found that product innovation had no major impact on financial performance of listed commercial banks in Kenya.

The fourth objective of the study was to examine the effect of financial market innovation on financial performance of commercial banks in Mombasa County. Based on the regression coefficient results ($\beta_4 = 0.204$, $t = 0.740$, $p < 0.05$), the study findings rejects the null hypothesis that financial market innovation has no significant effect on financial performance of commercial banks in Mombasa County. This implied that financial market innovations such as, money market innovation, capital market innovation, and forex market innovation have a significant contribution to the financial performance of commercial banks in Mombasa County.

CONCLUSIONS AND RECOMMENDATIONS

The findings of the study showed that financial process innovation had significant effect on the financial performance of commercial banks in Mombasa County. Accordingly, the study concludes that investment in financial process innovation does contribute to substantial changes in the financial performance of commercial banks in Mombasa County.

The results of the study showed that financial institution innovation had a significant influence on the financial performance of commercial banks in Mombasa Region. Accordingly, the study suggests that a rise in financial institution innovation would lead to an improvement in the financial performance of commercial banks in Mombasa County.

The study showed that financial product innovation had a significant positive influence on the financial performance of commercial banks in Mombasa County. Accordingly, the study suggests that a rise in financial product innovation would lead to an improvement in the financial performance of commercial banks in Mombasa County.

The findings of the analysis showed that financial market innovation had significant effects on the financial efficiency of commercial banks in Mombasa County. Subsequently, the report concludes that investment in financial market innovation does result in a substantial improvement in the financial performance of commercial banks in Mombasa County.

The study recommended as follows:
In order to attain good financial efficiency, the study advises that the management of commercial banks should successfully implement financial innovations in their particular circumstances. Management should first evaluate the capabilities, vulnerabilities, prospects and risks of their respective banks before introducing financial innovations in order to achieve the optimum effect on the financial performance of the bank.

The management of commercial banks should adopt financial process innovations in order to improve their financial performance. The management should identify and strategically

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introduce process innovations that will control cost drivers within the banks and the industry at large in order to achieve cost reductions and improve financial performance. By minimizing the cost drivers the banks can be able to reduce overhead costs, increase profits, and shift the benefits to the consumers by reducing prices and consequently improve their market share.

The management of commercial banks should adopt financial product innovations in order to improve financial performance. The management should invest in quality financial products and services to effectively respond to customers' demands. The management should employ diversification in their product innovations by offering products/services of different qualities and prices for different customer segments.

The management of commercial banks should adopt market innovation in order to improve financial performance. The banks should identify and focus on new markets and customers that they have an edge over other competitors. The management can innovate their branding and marketing activities to suit the preferences of different market segments. The companies can also innovate their corporate social responsibility initiatives to benefit market segments that highly utilize their services in order to promote customer loyalty.

Areas for Further Study

From the findings, the study suggested that a similar study should be carried out in another county and results compared.

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