

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

BY

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DECLARATION

This “research project is my original work and it has not been presented and submitted to any university or college for examination.

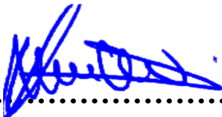
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DEDICATION

The dedication of this work enormously goes to my devoted family, friends, and mentors in appreciation of the support, encouragement, and motivation they offered me during the progress of my studies. They placed a strong foundation for my education. With God all things are possible.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
IT	Information Technology
ROA	Return on Assets
ROE	Return on Equity
TAM	Technology Acceptance Model

ABSTRACT

The study commendably assessed the effect of financial innovation on the imperative performance of the commercial banks in Kenya. Innovation diffusion theory in addition to technology acceptance model, importantly agency theory shaped the foundation of the study. The independent variables in the utilization were agency banking, mobile banking, together with Automated Teller Machine (ATM) banking. The control variable employed included capital adequacy with the ROA being the only dependent variable. The provision of the weakness and strength of various literature reviews on the research study provided a better insight and basis on how to effectively address the recognized gaps in the research. This study utilized a descriptive and inferential research design. Entire 42 registered commercial banks in Kenya formed the target population. The secondary data was highly employed and it entailed data on the numbers of transactions in agency banking, the value of transactions in mobile banking, the number of ATM networks, together with capital adequacy ratios. The secondary data were gathered with data collection sheets from various published annual reports on Kenyan commercial banks from 2012 to 2019. The statistical software utilized in the study for data analysis was SPSS v.22. A subsist relationship to financial innovation and banks' performance was subjected to Pearson Correlation, multiple regression analysis, and ANOVA. The F-tests together with T-tests were utilized to decide on the assigned variables association. R square was established as 0.541 which implied that 54.1% of the changes in explanatory variables were subjected to the total variation of the performance of the Kenyan banks. The results of the correlation analysis showed that ATM banking, agency banking, together with capital adequacy possess positive correspondence with the bank's imperative performance, while mobile banking had a negative correlation with the commercial banks performance. It was concluded from study that only the agency banking together with capital adequacy were established to be statistically significant. Besides, ATM banking together with mobile banking were established to be statistically insignificant in the performance of the commercial banks in Kenya. It was greatly acclaimed that commercial banks to intensify in agency banking since it was established to possess great substantial outcome on the bank's performances. Additionally, commercial banks are required to capitalize on efficient technological systems and to effectively manage the capital level in the bank to enhance the earnings and profitability of the banks.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Banks imperatively increased their performance proportionately by maximizing profit and minimizing the cost of operations due to financial innovation. Ahmed & Wamugo (2018) suggest that financial innovation has enabled mobile banking, together with Automated Teller Machine (ATM) banking to tremendously increase among the Kenyan banks. Acharya and Kagan (2004) suggest that the rise of financial innovation has ease services in the banks and enabled customers to have easy access to the bank balances, pay bills, and transfer money. The high growth of commercial banks has contributed to mobilizing savings and credit to the customers (Idowu, Ngumi & Muturi, 2016).

The viable use of superior financial innovation enables the technical operations of the immense banks outstandingly be successful. Financial innovation has been supported by various theories on innovations, first is agency theory, the second is the technology acceptance model theory, and lastly is innovation diffusion theory among others (Mwega, 2014). Therefore, this project research used the given three theories on innovation. Kariu (2015) suggested that agency theory concentrates on the association between the principal who is the firm's owner and the agent who acts as the manager of the firm. The theory focuses on imposing measures on the firm's managers to maximize the owners' return (Kariu, 2015). The technology acceptance model theory mainly focuses on one's aim to use technology based on alleged ease to use of new technology with free efforts together with the immense perceived usefulness of the update technology to increase performance (Charness & Boot, 2016). The innovation diffusion theory focuses on how the characteristics of innovation influence the successful use of technology. It explains how the adoption of new products, ideas and behaviors spread and even impact the society with time. Due to the utilization of the adept financial innovation, the theories were relevant in this study.

The world is positively changing due to financial innovation and competitiveness from the financial institutions. Financial innovation has increased the scope in which people

conduct business even among the low-income earners (World Bank, 2015). The banks have enhanced innovative ways of giving capital to the people through mobile banking (Mwega, 2014). Mobile banking refers the financial transactions services that enable the use of mobile devices remotely. It is an innovative adoption that escalates investor's return and banks' performance. Mobile banking enables the bank's financial services to be provided by the mobile network providers (Mutua, 2013). An annual report by the CBK (2020) showed an increase in the registered mobile money agents from 120,781 in 2014 to 224,108 in 2019. The number of mobile transactions in 2014 was 85.6 million then it increased to 154.9 million in 2019 (Central Bank of Kenya, 2020).

1.1.1 Financial Innovation

The making of new financial instruments, financial services and products, and updated processes is considered as financial innovation. Turfano (2002) suggests that financial innovation is a result of the overtime changes and improvements in the financial instruments and system of payments within the banking industry. Boot and Thakor (2007) suggested that product and service innovation entails creating solution outcomes to fulfill the customer's necessities in the market. The financial products and service innovations like E-banking among others help to facilitate the increase in the bank's performance (Njoroge, 2017).

Financial innovation has enabled mobile money lenders to increase their networks thereby increasing competition within the banks in Kenya. Ahmed & Wamugo (2018) suggested that mobile money services like Mpesa have reduced the performance of the local banks by creating competition. This has reduced the bank's performance despite having financial innovations. The bank's customers rely on network providers to do transactions. Delay in the banking system and transaction errors reduces the bank's profitability (Muiruri & Ngari, 2014). High banking performance enable the customers to conduct transactions effectively.

In agency banking, the banks collaborate with the third party retailers to provide the banking services like money withdrawal and making deposits for the customers. The

banks partner with various retail outlets like the shops, malls building and post offices to expand their financial services (Ahmed & Wamugo, 2018). The Banking Act Bill of 2009 was enacted by CBK to permit agency banking (Kamau & Oluoch, 2016). Annual report by the CBK (2020) showed an increase in the number of agents from 35,847 in 2014 to 67,314 in 2019. The total number of transaction for agency banking increased from 57,995,074 in 2014 to 162,969,153 in 2019 (CBK, 2020).

Automated Teller Machine (ATM) banking is an electronic financial transaction that operates with debit and credit cards at the bank's outlet. The Automated Teller Machines (ATMs) function for 24 hours and they offer quick self-services unlike the bank tellers (Ahmed & Wamugo, 2018). An annual report by the CBK (2020) showed a decrease in the number of ATM networks from 2,514 in 2014 to 2,459 in 2019. The reduction in the number of ATMs shows the banks direct resources to expanding new branches and relying on agency banking instead. Therefore, the study gave the significant effect that the financial innovation has on the bank's performance.

Drucke (2014) suggested that innovation impact the bank's processes and management needs in the banking institutions. New products, systems, and effective services caused by product innovation have improved financial processes in the banks. Process innovation enables the banks to incur lower operational costs and production costs. Larsson (2017) suggest that product innovation enables new products and services with various usage and functional characteristic to be made to satisfy the customer's needs.

1.1.2 Banks Performance

The growth in technological innovation influences the banks' performance. Njoroge (2017) suggests that financial technology has capably increased competition in substantial number of commercial banks by enabling the use of different forces of adept financial innovations. The financial innovation helps to achieve high customer transactions, low operational expenses, and high profitability.

Performance is the capacity to use and manage resources to enhance the competitiveness of an organization (Iswatia & Anshoria, 2007). Financial institution evaluates their performances using financial reports that show activities of financial performance like revenue and profitability. The earning ability among other various substantial determinants are used to determine the banks' performance (Kamande, Zablon & Arimba, 2016). Therefore, good performance gives the financial health to the banks after utilizing assets over a given period.

Research by Williams (2013) showed that all institutions around the world measure and report financial performance by using key performance indicators that are widely recognized sources of intelligent reports. To have good financial performance, institutions practice competency by efficiently transforming the available resources (Kiplangat, 2017). Without performance measures, an institution cannot have a proper overview of its financial performance. Financial performance helps an institution to measure its financial health over a given period (DeKool, 2014).

The banks aim at increasing sales and profits, market growth, and productivity to ensure their survival in the business through financial innovations and internet services. The attained revenues can only be determined by having financial performance measurements. Measuring a firm's performance requires financial indicators like the ROA (Allen & Gale, 2014). Therefore, this study focused on ROA as the core indicator of determining the banks performance.

1.1.3 Financial Innovation and Banks Performance

Various transformation has been enhanced by the Kenyan banks due to financial innovation. To attract customers and to continuously provide sufficient services and products to customers, the banks utilize financial innovation. The main factors influencing the concentration of banks on innovation are; first is to create new avenues of streaming revenues by improving the existing and providing new services and products. Secondly is to have their products, systems, and services distinguished from those of the rivals to increase the user experience. The third is to optimize the operational cost

incurred by the banks and lastly is to enable the banks to effectively evaluate the risk and detect any kind of fraud (CBK, 2020).

Aduda & Kingoo (2012) suggested that the attempt by the banks to enhance the quality of their services has been rendered possible through the solicitation of highly information related technology. With the ATM cards, the clients can do transactions at the ATM or with a bank's agency located at every outlet, even in the rural. Mobile banking enabled the banks to attract many clients and increase customer deposits, thus enhancing performance. The Central Bank of Kenya (2020) reported that from the start of 2018 to 2019, the total deposits of the banks increased by 7% through agency banking together with mobile banking. The majority of the banks have collaborated with telecommunication companies to provide mobile networks to their banking clients. The poor in the remote areas have higher familiarity and trust in mobile phone services than in ordinary banks due to the availability and low-cost mobile network in the rural (Okiro & Ndungu, 2013).

The banks have invested a reasonable amount of resources through innovation to improve their service quality. Investing in technology is a huge expense for the banks that affects the balance sheet. Utilization of mobile banking, agency banking, together with ATM cards highly emanate with their challenges. The challenges associated with the technology include having the plastic money subjected to lose and identity theft where an anonymous person accesses the information of the original cardholder (Arnaboldi & Claeys, 2008). The main innovation risks in the banks are operational risks, third-party risks, and cyber risks. The banks need to adopt good measures to monitor the risk brought by financial innovations and reduce the associated costs. This prevents the risks of innovations from causing negative effects on their productivity. Therefore, there is a need for a balance between the given areas to enable the banks to have a strong financial condition.

1.1.4 Commercial Banks in Kenya

Kenyan commercial banks are characterized by stiff competition and technological changes among the commercial banks, however, the banks are regulated by the CBK. The innovation in the commercial banks is grounded on processes, products, markets, and institutions. The CBK (2019) survey shows Kenya has 42 registered banks with varying corporate capital, customer base, and different operating branches. 40 of the commercial banks are privately owned while the remaining 2 banks have the Kenyan government with the majority ownership.

Among the privately owned banks, 23 are locally-owned banks (Central Bank of Kenya, 2020). Few banks like the equity banks, KCB, Family banks, and Cooperative bank uses agency banking. The banks utilize financial innovation to enhance the confidence of the investors, minimize risks, increase the public image and increase the customer satisfaction (Mabrouk & Mamoghli, 2010).

1.2 Research Problem

Financial innovation enables the banks to increase their profits, and efficiency and eliminate resource wastage. However, the banks still face problems like incurring losses due to high operating costs associated with the financial innovation. Ahmed & Wagumo (2018) suggest that the local banks still experience huge losses despite the wide use of financial innovations to have cost efficiency. Various studies showed there are low earnings by the banks despite using certain avenues of financial innovation. There have been attempts by various researchers to conduct deep research and to determine if indeed the financial innovation like mobile banking and ATM banking have an influence on the bank's profitability or not. The research was triggered by the demand for more studies on the performance of the Kenyan banks. Questions have been raised as to whether the tools of the financial innovations effectively enhance the profitability of the Kenyan banks. Various reports indicated that the Kenyan banks have devised more innovative products through the application of financial innovations (Kinuthia, 2008). However, it faces challenges like having low charges on the digital channels to attract customers and to be

competitive. This study determined how the financial innovation affects the banks performance.

As the banks performance increased the use of financial innovation in Kenya, the security issues and customers concerns still posed challenges (Kombe & Wafula, 2015). The past research showed limited support for the study and there has been a gap in conceptualization, methodologies, and findings by various research studies (Lawal, 2012). There is a lack of consensus as to whether forces of financial innovations positively or negatively affect banks performance. For example, a study by Lerner (2006); DeYoung (2005); Nofie (2011), and Agboola (2006) exhibited a positive correlation between financial innovation and the performance of banks. Done were the stated studies in the US, Indonesia, together with Nigeria and therefore, they cannot be generalized to the adept performance of entire banks functioning within Kenya. Nevertheless, further submission by MacAndrew (2002) along with Prager (2001) demonstrated a negative correlation between financial innovation and the performance of banks. As for the stated studies, they mainly focused on the level of ATM banking in small banks. This study, therefore, focused on three stout forces of adept financial innovation across the immense registered banks highly operating in Kenya.

Differences in the covered prevailing study's findings provided a sufficient reason to conduct further studies on the underlying effect of adept financial innovation and the imperative performance of the banks. Despite of any evident high growth of financial innovation, the recent annual data by CBK shows the number of ATM networks is reducing in Kenya and this raises a question (Central Bank of Kenya, 2020). Due to the gap on whether financial innovation results in banks' performance, this study examined how the financial innovation contributes to the overall bank's profitability by assessing the research question; how does financial innovation have an effect on the performance of Kenyan banks?

1.3 Objective of the Study

1.3.1 General Objective

The research determined how financial innovation affects the banks performances in Kenya.

1.3.2 Specific Objective

- i. To examine the effect of mobile banking on the performance of banks in Kenya.
- ii. To explore the effect of agency banking on the performance of banks in Kenya.
- iii. To inspect the effect of Automated Teller Machine (ATM) banking on the performance of banks in Kenya.

1.4 Value of the Study

The study's significance is highly grounded on effective creation of understanding of how the given adept financial innovation highly impacts the immense performance of Kenya's banking. More importantly, the study to particularly motivate innumerable researchers to know the importance of using financial innovations and their contribution to the Kenyan GDP growth. The importance of financial innovation is properly seen when it influences the performances of the commercial banks, thus enabling the banks to increase the quality of their services and minimize cost. The study helps policymakers for financial institutions to make effective policy and strategic decisions related to financial innovation practices.

The study will be significant to the researchers who get interested to research the knowledge gap. The theories in this study need to enhance other kinds of literature on this particular study, thereby providing more suggestions for future studies as to whether financial innovations affect the banks performance or not.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A decisive and key theoretical framework together with the literature review, important inclusion of the conceptual framework are suitably deliberated in this portion.

2.2 Theoretical Framework

Quite a few theories got reviewed to expound on how the success of a firm is impacted by innovations. The theories related to the study include; Agency theory together with innovation diffusion theory, in addition to technology acceptance theory (Kariu, 2015).

2.2.1 Agency Theory

Originally, Ross (1973) came up with the idea of economic agency theory then Mitnick (1975) worked independently to improve the idea of institutional theory of agency. It entails the working relationship between the firm's owner and the agent who acts as the manager of the firm. Kariu (2015) suggests that the theory focuses on the possibilities of imposing measures to enable the managers to have actions that result in the maximization of owners' returns. Agency theory suggests that the agent act on behalf of the principal to transact and make strategic investment decisions to have the utility preference principal maximized. When an agent has self-interests, agency conflict arises due to the varying goals between the principal and the agent.

Amihud and Lev (1981) specifically used incentive compensation and risk to describe that conglomerate mergers reduced the shareholder values. The managers are encouraged to reduce risks by safeguarding the non-diversifiable human capital. The bank managers are considered to avoid the higher risk that maximizes the shareholder value. The agency theory is considered to ignore the aspect of the stock-owned management.

According to Wiseman (1976), agency theory examines the trade-off risk between the principal and agent in identifying the risk and return in firms. This theory gives the trade-off required to attain adequate results between the cost of monitoring the agent behaviors on adverse selection and moral hazards (Donnellan & Rutledge, 2016).

2.2.2 Innovation Diffusion Theory

Innovation diffusion theory was progressively developed by Rogers (1962) to explain how the major characteristics of innovation influence the successful use of technology. The theory was derived from communication and it tends to explain how a new product, idea, and behavior spread and their result to effective and wide adoption of a brand product, idea, and behavior by immense society over time. Mahajan and Peterson (1985) suggested that innovation particularly is any novel idea, some unique practice, or devise perceived to be new by the social system members, while diffusion of innovation involves communicating innovation through certain channels for a long period within the social systems.

Rogers (1962) suggested that innovation is a steady process of adopting new ideas, products, and services which do not occur simultaneously. With the need to utilize the new product or acquire new behaviors different from the previous ones, innovation diffusion theory is dominated by assumptions that users adopt new technology to maximize their utility. Numerous studies suggest that this is not the case since it does not integrate reality from various contexts. Sevcik (2004) expressed that not every good

innovation can be adopted since the innovation can take a long period to be accepted. The people resisting change also make the diffusion of modernism slow down.

There are elements influencing the adoption of innovation (Rogers, 1995). The trialability and observability are variables of innovation diffusion theory that deemed to possess ineffective influence the eclectic acceptance of the online sort of financial transaction. Research conducted by Lin (2011) showed that Relative advantage and compatibility variables are proven to positively impact the use of the online financial transaction. The banks in Kenya highly adopt innovations due to the availability of the required network system and IT department.

2.2.3 Technology Acceptance Model Theory

Originally, the theory is associated with Davis (1989) to describe the factors in acceptance of the innovation in internet banking. The theory focuses on the primary factors inducing a person to use technology and they entailed; the perceived ease to use new technology and the perceived usefulness of the new technology (Charness & Boot, 2016). Perceived usefulness enables an organization to use new systems for performance improvement and increase margin profits. The banks in Kenya have continued to use new systems. On the perceived ease to use new technology, a person has their attitudes and behaviors influenced by their intention of using the technology (David, 1989). TAM model suggests that the users need a user-friendly system and free effort to use the end interface of the technology.

The TAM aims at showing how the external factors have an impact on the internal beliefs, attitudes, and intentions and that any external variables impact the people's behaviors only indirectly through perception (Davis, 1989). TAM reasoned action suggests that behavioral acts of a person are affected by the perception in individuals. Intentions for having expectations or motivating a person to comply with the given expectations make subjective norms (Fishbein & Ajzen, 1975). The TAM also varies in different aspects about subjective norms. Schepers and Wetzels (2007) found that people's belief has a greater impact on the need to use innovation in western settings as compared to non-western settings.

Chang (2009); Sukkar and Hasan (2005) examined how the customers observed and responded to changes caused by technological innovations to serve their banking needs. The perceived changes were that internet banking positively transformed the quality and way of service delivery in the banking industry (Onyiriuba, 2016). The customers accept new financial technology like mobile banking which is not complicated to navigate and which is convenient to be used by the unskilled population.

2.3 Determinants of Banks Performance

The underlying determinants are convened into internal factors which are individual to the bank characteristics and external factors which are past the organization's control (Aburime, 2005). The bank's performance is impacted by capital adequacy, size of the bank, liquidity management and earning ability.

2.3.1 Capital Adequacy

Owner's accumulated asset for operations by the banks that are needed to cushion the banks from risks is a capital (Athanasoglou et al. 2005). The capital adequacy vastly affects the range given of profitability level. Diamond (2002) suggested that improving a bank's capital reduces the possibilities of distress and instead, increases economic growth. It can be used to depict CAR which displays the inner capability of a bank when operating under difficulty (Dang, 2011). Higher CAR indicates better bank performance.

2.3.2 Asset Quality

Assets have economic value and are owned by the banks to provide future benefits. Ongore & Kusa (2013) suggested that assets are reported on the bank's balance sheet and they entail current assets, fixed assets, bank's loans, credit portfolios, and other investments. Asset quality is the assessment of assets to determine the size and level of credit risk associated with the given asset like a bond or stock portfolio (Cheruiyot, 2016).

Dang (2011) on banks suggested that the profitability is directly sort upon by the quality of loan portfolio. Importantly, NPL subject banks to a higher risk of financial performance by causing lower asset quality hence low return on assets. Higher NPL or lower asset quality reduces the operating profit margin of the banks and decreases the capital base for the formation of new loans. According to Whalen (1991), lower asset quality beyond certain levels can result in bankruptcies and slow economic growth thus being one of the reasons for the 2008 global crisis. Asset quality and bank's profitability positively relates (Cheruiyot, 2016).

2.3.3 Earning Ability

Earning ability shows the capability of a bank to generate sufficient returns to increase its capital and rewards its shareholders and it can be measured using ROA and ROE (Ongore & Kusa, 2013). A bank that has little earning ability reduce its capital and liquidity thus lowering the confidence of the public. Earning indicates firm's financial health and the banks with falling financial positions can run into solvency when the capital is depleted. The earnings are recorded in the balance sheet and used in the future for making banks performance decisions. A positive relationship exists between the bank's earning ability and the bank's profitability.

2.3.4 Liquidity Management

The practice of reducing liquidity risk is called liquidity management and it shows how the bank is capable of meeting its short-term financial obligation. Dang (2011) suggested that higher liquidity is positively associated with the bank's profitability. Cash, savings accounts and checkable accounts are an example of the liquid assets within the bank. Cash is readily made available to fund short-term investments, repay debts and pay bills without affecting its market price (Ongore & Kusa, 2013). Various financial metrics like the liquid asset ratio show the available liquidity for the banks to meet expected and unexpected demand for cash. The liquid asset ratio positively relates to the bank's performance (Ferrouhi, 2014).

2.4 Empirical Review

2.4.1 Global Studies

Malhotra & Singh (2006) explored the influence of financial innovation on internet banking in Indian banks. The study investigated whether the banks with many years in internet banking performed better than the banks that newly started using internet banking. From 1998 to 2007, a univariate analysis of 82 banks through multiple regression showed that the banks with many years in internet banking had high operating efficiency ratios. The internet-based banks were larger and they hardly relied on the traditional sources of financing unlike the banks with little or no experience in internet banking. Therefore, financial innovation in regards to internet banking got no impact in regards to the study.

According to Shirley & Sushanta (2006) study on IT within the U.S banks, their theoretical and empirical study assessed how IT-based financial innovations like electronic payments impacted the profitability of the U.S banks via competition in financial services from the banks. It utilized a panel of 68 U.S banks. The finding revealed that IT-based financial innovation can reduce the operation cost, but investing too much in IT creates high network effects that reduce the profitability of the banks. The low network effects possibly enable the IT outflow to escalate needs for market share and lowers the workforce overheads.

2.4.2 Local Studies

Korir (2014) explored profound connection on financial innovations together with financial performance of the 42 banks found in Kenya by especially using secondary sources. His work effectively examined using both regression together with correlation analysis. By using a descriptive research design, Korir (2014) assessed whether the value of electronic fund transfers (EFT) and RTGS transactions in any case influenced the bank's profitability and thus depicting a strong positive relationship.

Kimingi (2010) did a study using descriptive and content analysis techniques in studying the influence of technological innovation on financial performance. The target population was the Kenyan banks and it used a descriptive survey. He suggested that wide range of

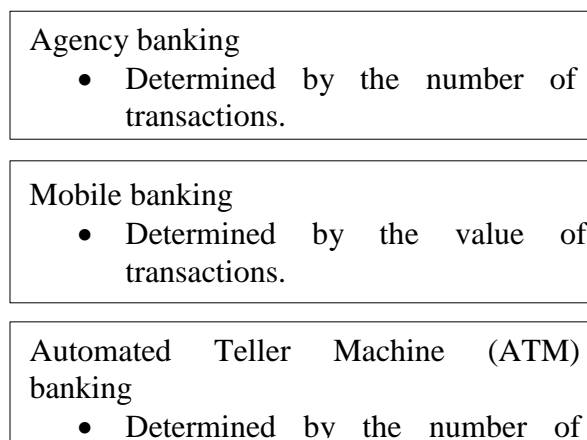
commercial banks employed highly varied technological innovations. It was determined that the technological innovations resulted to a high financial performance by enhancing bank sales, profitability, and ROE. The study determined that technological innovation like internet banking gives banks a competitive advantage.

Mwangi (2013) did a study to investigate whether innovations got any sort of effect on the financial performance. He earnestly concentrated on innovations related to finance within the banks like the ATM banking among others. He applied a descriptive survey design with the utilization of simply primary data highly obtained by questionnaires. A target population of 20 Kenyan banks was examined using SPSS. He effectively demonstrated that adept innovation had a statistically substantial impact on the income, profitability, customer credit, and ROA of the Kenyan banks. The study did not cover EFT effectively, however, it determined that mobile banking highly contributed to a bank's performance than internet banking. The bank innovations positively influence the Kenya's bank performance.

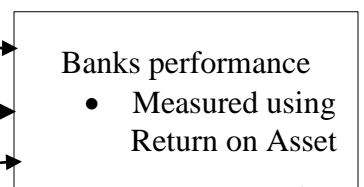
2.5 Conceptual Framework

A diagram showing the association of various variables is given. Independent variables in this study are Automated Teller Machine (ATM) banking, next is agency banking together with mobile banking. The first variable was analyzed using the number of ATM networks, agency banking was analyzed using the number of transactions, and latter was analyzed using the value of transactions. However, the valuable dependent variable was highly demonstrated by ROA, along control variable highly demonstrated by capital adequacy.

Independent variables (X)



Dependent Variable (Y)



Control Variables

Capital adequacy

- Determined by Capital adequacy ratio

2.6 Summary of Literature Review

A summary of how the idea of financial innovation is accepted within the system of society through various theories supporting innovation is given. Financial institutions uses capital adequacy, size of the bank, and earning ability to influence their performance. Financial innovation should be adopted by every financial institution to increase performance. The banks devise new products and services that applies to every individual even as technology acceptance develops with time. Innovation is beneficial to the banks as it helps in minimizing the risks and enhancing profitability hence impacting their performance at large. The literature review of the local studies by Korir (2014); Kimingi (2010) and Mwangi (2013) showed that actually adept financial innovations indeed enhanced effectiveness and immense performance of the wide range of banks established in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The content gives research guides and methods used to collect, analyze, and interpret the observed data (Bless & Achola, 1988).

3.2 Research Design

Picking a subject of study, reference sources, and procedures for data collection to solve the research question is research design (Mcmillan & Schumaker, 2001). The research design which was used is the casual research designs. This is because an examination was effectively steered and conducted to ascertain the cause and effect among the clearly stated variables. The study specifically looked at how the financial innovation affected performance of the banks from 2012 to 2019.

3.3 Target Population

Researchers use population to make deductive interpretations (Cooper & Emory, 1995). The targeted population was all the Kenyan banks from the year 2012 to 2019. The size was the 42 commercial banks licensed by the CBK.

3.4 Census Technique

The enumeration method entailed the list of the bank's population which is the 42 registered banks in Kenya. Imperial Bank and Chase Bank from the entire population are under receivership and their financial statement have not been submitted to CBK thereby they did not be included in the study. The enumeration technique that was used is the census technique because the population target was small (Kothari, 2004).

3.5 Data Collection

Definite general plan for effective data collection was basically from secondary sources. Varied sources for data was the Kenya Bureau of Statistics, bank supervision annual report by CBK, and published reports like the World Bank national accounts. The data collected was Return on Assets, capital adequacy ratios, numbers of transactions for agency banking, numbers of ATM networks, and value of transactions for mobile banking.

3.6 Data Analysis

This is the section that entails analysis of the data, the finding together with in-depth discussions as determined in the evidently listed research objectives. Essential software which was utilized for quantitative data analysis is the SPSS. Multiple regression analysis with F-test for ANOVA and T-test was applied in the inferential analysis. After the analysis, the obtained results were presented using tables.

3.6.1 Diagnostic Tests

3.6.1.1 Autocorrelation test

Greene (2008) suggested that autocorrelation is the degree of likeness between time series data over a time interval where the lagged value is related to the original value. The Durbin Watson (DW) determined the autocorrelation by investigating the residual value from the analysis. A residual value of Durbin Watson equal to 2.0 would show no

autocorrelation, while the value of Durbin Watson less than 2.0 would show positive autocorrelation and a value more than 2.0 would show negative autocorrelation. Linear regression residual that would give a smaller P-value than the observed value would show autocorrelation among residuals hence rejecting the null hypothesis (Durbin & Watson, 1950).

3.6.1.2 Multicollinearity test

Kumari (2008) suggested that multicollinearity is the presence of linear relationship within the predictor's variables. Variance inflation factor (VIF) would assess the correlations between independent variables and strength of the given correlation. The VIF value of 1 would show no correlation between the independent variables hence null hypothesis is accepted. VIF below 5 would show moderate multicollinearity while VIF between 5 and 10 shows high multicollinearity thus requiring some redundant predictors to be removed. VIF above 10 would show a serious problem with multicollinearity (Oscar, 2007). A linear regression of the t-test got utilized.

3.6.2 Analytical Model

The investigative plan applied in the project was the multiple regression model. SPSS was utilized to explore the analytical model. Below is the presentation of the table.

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

Where:

Y – Banks Performance measured using ROA

α – Y-intercept or constant measuring Y when X is zero

X_1 – Agency banking measured by the number of transactions.

X_2 – Mobile banking measured by the value of transactions.

X_3 – ATM banking measured using number of ATM machines.

X_4 – Capital adequacy measured using capital adequacy ratio

B_i – Beta coefficient of the independent variables.

ε – Error term capturing all excluded relevant variables.

3.6.3 Significance Tests

The research effectively utilized multiple analysis of linear regression to properly demonstrate the statistical significance. Vital statistical tests that were done were the T-test together with F-test for ANOVA both fairly subjected to 5% significance level mainly where the T-test along with F-test were utilized to express when the relationship is statistically significant.

CHAPTER FOUR DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

Explored in depth discoveries together with effective analysis of the data in this portion are given in the tables.

4.2 Diagnostic Test

4.2.1 Autocorrelation test

The Durbin Watson (DW) tested the autocorrelation as it clearly displayed in table 4.4. A residual value of 0.490 was determined. The study revealed a Durbin Watson (DW) test of 0.490 which was below 2.0. This indicated that there was positive autocorrelation.

4.2.2 Multicollinearity test

The multicollinearity of linear relationship within the predictor's variables was determined. It assessed the correlations between independent variables and strength of the given correlation. From table 4.1 below, the VIF values ranged from 1.749 to 2.716 at 95% confidence level and it showed no serious problem with the multicollinearity.

Table 4.1: Coefficients

Model		C.S	
		Tolerance	VIF
1	(C)		
	Agency banking	.480	2.083
	Mobile banking	.368	2.716
	ATM banking	.584	1.712
	CAR	.572	1.749

Source: Data Research

4.3 Descriptive Statistics

The findings of the research were aided by the utilization of descriptive statistics to determine the frequency of occurrence and association among the given instruments as determined.

Table 4.2: Descriptive Statistics

	Mean	Std. Deviation	N
ROA	2.837	.2386	32
Agency banking	108014219.38	52803637.438	32
Mobile banking	247.925	85.1295	32
ATM banking	2591.25	203.227	32
CAR	19.350	.8606	32

Source: Research Data

It is pointed out in table 4.2 that the determined mean of the ROA is 2.837 and the standard deviation is 0.2386. The average number of transaction of agency banking is 108 million with a standard deviation 52.8 million. The average value of transaction in mobile banking is 247.925 billion with a standard deviation of 85.129 billion. The capital adequacy ratio had a mean of 19.35 together with std. of 0.8606.

4.4 Inferential Statistics

In effect, a multiple linear regression was effectually tested. The study effectively employed newly updated SPSS. Correlation analysis was applied in the study to further show the related connection in the specified wide range of variables.

4.4.1 Correlation Analysis

In effect, a Pearson Correlation was considered in the linked interrelated analysis at a confidence level of 95% as given in table 4.3. A positive linear relationship ($R=0.455$) was found to exist in regards to the number of transactions in agency banking along the immense performance of wide spread banks. This indicated that high levels of transaction numbers using agency banking effectively increases profitability at large. Evidently, interrelatedness ($R= -0.036$) was found to exist along the enormous value of transactions in mobile banking and performance of the Kenyan banks. Evidently, positive interrelatedness ($R=0.246$) was found to exist between the number of ATM networks in Automated Teller Machine banking together with the immense performance of the widespread banks. A robust positive interrelatedness along capital adequacy at ($R=0.366$) together with the performance was effectively determined.

Table 4.3: Correlations Analysis

		ROA	Agency banking	Mobile banking	ATM banking
Pearson Correlation	ROA	1.000			
	Agency banking	.455	1.000		
	Mobile banking	-.036	.647	1.000	

	ATM banking	.246	.604	.552	1.000
	CAR	.366	-.334	-.641	-.379

Source: Data Research

4.4.2 Regression Analysis

The regression model $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ was analyzed using regression. Table 4.4 is a summary that shows the coefficient determinant as the dependent variable changes in response to the changes in the explanatory variables. As stated, the Y variable in the research was the performance of the banks.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.735	.541	.473	.1733	.490

a. Predictors: (Constant), CAR, Agency banking, ATM banking, Mobile banking

As illustrated, it was evidently depicted, Coefficient determinant as 0.541 which accurately inferred that 54.1% of the changes in explanatory variables were effectively subjected to the total variation of the immense performance of the well-established banks.

4.4.3 ANOVA

The ANOVA established the significant association between the Y and the X variables. A clear aftermath analysis of the ANOVA is illustrated below. It was determined that a p-value of 0.001 was of a slighter amount compared to $\alpha = 0.05$. Nonetheless, a substantially significant interrelatedness was determined between the dependent and predictors variables with (F= 7.948, $\alpha=0.05$: $p < 0.001$).

Table 4.5: ANOVA

Model		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.954	4	.239	7.948	<.001 ^b
	Residual	.811	27	.030		
	Total	1.765	31			

a. Dependent Variable: ROA

4.4.4 Results of Regression Coefficient

The regression coefficient was obtained for the independent variables from model given as $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$. Therefore, a regression model was obtained from table 4.6 and it was provided as:

$$ROA = -0.443 + 0.003X_1 - 0.001X_2 + 0.00X_3 + 0.137X_4.$$

Table 4.6: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	-.443	1.143		-.388	.701
	Agency banking	.003	.000	.688	3.656	.001
	Mobile banking	-.001	.001	-.251	-1.169	.253
	ATM banking	.000	.000	.156	.912	.370
	CAR	.137	.048	.493	2.859	.008

Source: Data Research

4.5 Discussion of the Findings

By manifestly centering on the regression coefficient, more importantly, regression model showed that a variance in unit in the number of transaction in agency banking as other factors are constant, initiated the higher performance of the Kenyans banks by 0.003 in a year when other factors are constant. This is because the coefficient was found to be 0.003. The explanatory variable was established to be statistically significant at 5% significant level (P-value of $0.001 < 0.05$).

Solitary unit change in the value of transaction in mobile banking reduced the performance of the Kenyan banks by -0.001 in a year when other factors are constant. The explanatory variable was established as statistically insignificant at 5% significant level (P-value of $0.253 > 0.05$) to show the performance variation of the Kenyan banks.

Also, a solitary variation in unit in immense number of ATM networks indicatively unaffected the performance of the Kenyans banks by 0.000 in a year when other factors are constant. The explanatory variable was statistically insignificant at 5% significant level (P-value of $0.370 > 0.05$) to show no performance variation in the Kenyan banks. The CBK (2020) suggest that the numbers of ATM banking in having been reducing over time in the past years. The Kenyan banks have cut expansion on the ATM banking since it do not enhance their productivity.

Lastly, a solitary variation in unit in capital adequacy suitably raised the immense performance of the functionally wide range banks by 0.137 in a year when other factors are constant. The explanatory variable was determined to be statistically significant at 5% significant level (P-value of $0.008 < 0.05$) to show the performance variation of the banks in Kenya. Additionally, Capital adequacy possess a highly positive bearing on the ROA of the Kenyan banks. This result conforms to the finding of Athanasoglou et al, (2005) that suggest that capital adequacy affects the profitability level of the bank.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Portion of the chapter entail indepth findings together with conclusion, more importantly, the recommendations.

5.2 Summary of Finding

In a nutshell, the focus of the research examined how the mobile banking influences the performance of the Kenyan banks; how agency banking influences the performance of Kenyans banks, and how the ATM banking influences the performance of Kenyan banks.

On examining the effect of mobile banking on the bank's performance, the research revealed a weak negative correlation between the values of transactions of mobile banking, together with ROA. It was determined that, undeniably mobile banking has a

negative outcome on the immense performance of the vast banks. The association linking the mobile banking together with performance of the banks was insignificant. It determined that high values of transactions using mobile banking at little transaction fees slightly lower the profitability of the banks.

The next specific objective of the study revealed that a strong positive correlation exists between the numbers of transactions of agency banking together with ROA. It was determined that the interrelatedness linking agency banking together with performance of the banks, indeed was positively strong. It was found that high numbers of transactions in agency banking highly result in banks performance and profitability.

While inspecting the effect of ATM banking on the performance of Kenyans banks. The research exposed that no correlation exists between the number of ATM networks and ROA. It was determined that Automated Teller Machine (ATM) banking does not affect the performance of the banks in Kenya. The relationship between the ATM banking together with performance of the banks was insignificant. As a result, high numbers of ATM banking do not influence the banks performance and profitability.

In the relationship between the capital adequacy and performance of the banks in Kenya, a positive correlation existed between the capital adequacy and performance of the Kenyan banks. There was a correlation coefficient of 0.137 which indicated how positive the given variables are related. The demonstration by the regression coefficient clearly showed that high capital adequacy can result in increased performance by the banks. Sufian & Chong (2009) suggested that high capital adequacy enables the banks to increase their profitability. Thus, the banks need to have adequate capital to enhance their operations and safety of the banks.

5.3 Conclusion

In regards to the outcomes of the research, it is established that financial innovation can either positively or negatively affect the performance of the Kenyan banks. The forces of the financial innovation like agency banking and capital adequacy were found to be

statistically significant to the performance of the Kenyan banks. On the other hand, ATM banking and mobile banking were found to be statistically insignificant. Agency banking had a positive correlation coefficient with the bank performance thereby offering the banks greater opportunities of increasing their performance. Agency banking enables the customers to make transactions through agents in an easy manner. The study showed that high numbers of customer transactions through withdrawals or deposits make the banks increase their ROA.

Similarly, mobile banking indeed represented negative correlation coefficient together with the immense performance of the vast banks. Mobile banking provides greater opportunities through which the people can send and receive money through their mobile phones. However, the banks face stiff competition from other money providers like the Mpesa. This makes mobile banking lower the bank's performance through mobile banking. The study showed that the values of transactions made through mobile banking make the banks slightly reduce their ROA.

Automated Teller Machine (ATM) banking had a positive correlation coefficient with the immense performance of the vast banks. The ATM technology enables the customers to bank their money without the help of the human tellers. It makes it very convenient for the customers to manage the basic transactions of their funds in accounts and it increases the loyalty among the customers. The banks do not increase performance through the aid of Automated Teller Machine (ATM) banking. It was evidently depicted that the numbers of ATM networks possessed zero impact on the immense ROA. According to the CBK report, it showed that the Kenyan banks reduced using ATM banking due to customers using agency banking and mobile banking.

It is very clear that not all the financial innovation forces enhance the enormous performance of the entire banks in addition to boosting ROA. Mobile banking uses the services of mobile providers like Safaricom which offers stiff competition using Mpesa. This slightly lowers the performance of the banks. ATM banking has no impact on ROA therefore, the banks do not see the need of expanding their ATM networks. Instead,

banks embrace agency banking which increases ROA. It was noted that capital adequacy enhances the ROA of banks.

5.4 Recommendation

The study highly recommends the largely functioning banks to focus their intensification only in robust financial innovation that effectively enhances the bank performance. The utilization of certain innovation technology does not effectively enhance the banks profitability. For instance, the study showed negative effects of mobile banking are slightly felt on the banks performance, but the banks still keep utilizing it because the customers consider it very convenient to use anytime. Therefore, it is recommended the banks stay focused and expand more of their investment in agency banking to highly enhance their financial capacity since it positively impact banks performance. Also, limiting the expansion of mobile banking by the commercial banks tends to lower the cost of operation that might badly affect banks profitability.

Automated Teller Machine banking has no impact on banks performance, therefore, it is recommended for banks not to create more ATM points that are not properly used by the customers to enable banks save on the capital investment. Instead, the commercial banks to embrace agency banking as technique to boost their profitability and adeptness. In addition, the study exposed that capital adequacy highly possess undeviating bearing the immense performance of the vast banks. It is consequently acclaimed that the banks effectively manage their capital through operational efficiency. The profitability and earnings of the banks greatly rely on the capital level. The banks need to have proper management strategies for maintaining an adequate level of capital to enhance their operations. Also, the banks to have efficient technological systems and security strategies to avoid errors in a transaction that can cause the bank failure. Bad technological systems are far and wide acknowledged to undesirably shake the noble performance of the widely functional banks in addition to discourage the customers from using poor services.

5.5 Limitation of the Study

Tremendously, the study effectively utilized simply three avenues of highly and adept financial innovation mainly; mobile banking, agency banking, together with ATM banking as the key independent variables in the research. Other avenues of financial innovations like internet banking were not utilized in the study. Therefore, this research was only limited to covering only a few forces of adept financial innovation that largely impact the immense performance of the commercial banks in Kenya.

Again, it only profoundly focused on one distinct metric, a dependent variable which was the ROA to measure the banks performance. The other existing metrics, dependent variables that measure the banks performance such as the ROE or earning per shares (EPS) growth were not adequately employed.

5.6 Suggestions for Further Research

Added call for indispensable to research why there is a declining pattern in the use of ATM banking as well a drop in the opening out of ATM network specifically for the immense Kenyan banks since it is a critical avenue of adept financial innovation. In addition, further studies to examine how the commercial banks enhance their profitability through mobile banking which is a critical avenue of financial innovation, considering that the commercial banks charge very low to zero transaction costs on users of the mobile deposit transactions.

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APPENDICES

Appendix I: Data collection form

Year	Quarter	ROA	Agency Banking effectively metricized by No. of transactions (Ksh.' Million)	Mobile Banking effectively metricized by the value of Transactions (Ksh.' billion)	ATM Banking effectively metricized by No. ATM Network	Capital Adequacy of banks as measured by capital adequacy ratio (percentage)
2012						
2013						
2014						

2015						
2016						
2017						
2018						
2019						

Appendix II: Data Research

Year	Quarter	ROA	Agency Banking effectively metricized by No. of transactions (Ksh. ' Million)	Mobile Banking effectively metricized by the value of Transactions (Ksh. ' billion)	ATM Banking effectively metricized by No. ATM Network	Capital Adequacy of banks as measured by capital adequacy ratio (percentage)
2012	Q1	2.5	40007452	150.2	2151	19.0
2012	Q2	2.5	40007452	150.2	2183	19.0
2012	Q3	2.5	40007452	150.2	2217	19.0
2012	Q4	2.5	40007452	150.2	2205	19.0
2013	Q1	2.7	52055754	165.0	2397	21.0

2013	Q2	2.7	52055754	165.0	2439	21.0
2013	Q3	2.7	52055754	165.0	2478	21.0
2013	Q4	2.7	52055754	165.0	2487	21.0
2014	Q1	3.1	67995074	182.5	2595	20.0
2014	Q2	3.1	67995074	182.5	2529	20.0
2014	Q3	3.1	67995074	182.5	2618	20.0
2014	Q4	3.1	67995074	182.5	2613	20.0
2015	Q1	2.9	79889383	225.6	2656	19.0
2015	Q2	2.9	79889383	225.6	2698	19.0
2015	Q3	2.9	79889383	225.6	2708	19.0
2015	Q4	2.9	79889383	225.6	2718	19.0
2016	Q1	3.2	194193459	206.8	2759	19.8
2016	Q2	3.2	194193459	206.8	2682	19.8
2016	Q3	3.2	194193459	206.8	2658	19.8
2016	Q4	3.2	194193459	206.8	2656	19.8
2017	Q1	2.7	129751189	322.6	2791	18.8
2017	Q2	2.7	129751189	322.6	2782	18.8
2017	Q3	2.8	129751189	322.6	2771	18.8
2017	Q4	2.7	129751189	322.6	2825	18.8
2018	Q1	2.6	147252291	357.8	2848	18.0
2018	Q2	2.6	147252291	357.8	2828	18.0
2018	Q3	2.6	147252291	357.8	2840	18.0
2018	Q4	2.6	147252291	357.8	2833	18.0
2019	Q1	3.0	152969153	372.9	2510	19.2
2019	Q2	3.0	152969153	372.9	2522	19.2
2019	Q3	3.0	152969153	372.9	2464	19.2
2019	Q4	3.0	152969153	372.9	2459	19.2