

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

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DECLARATION

This research project is my original work and has not been presented for examination in any other university.

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DEDICATION

I dedicate this research project to my family, Mr. and Mrs. Muriithi, Albert Gathara, Joy Wambui and Janet Wangui. May this project be a source of inspiration and may it make you proud.

ABBREVIATIONS AND ACRONYMS

ANOVA:	Analysis of Variance
ATM:	Automated Teller Machines
CBK:	Central Bank of Kenya
CBN:	Central Bank of Nigeria
DMBs:	Deposit Money Banks
EFT:	Electronic Fund Transfer
ER:	Efficiency Ratio
FY:	Financial Year
KEPSS:	Kenya Electronic Payment and Settlement System
Ksh:	Kenyan Shilling
MOB:	Mobile Banking
NGX:	Nigeria Exchange Group
NIM:	Net Interest Margin
NPAs:	Non-Performing Assets
PEOU:	Perceived Ease of Use
POS:	Point of Sale
PU:	Perceived Usefulness
RBV:	Resource-Based View
ROA:	Return on Assets
ROE:	Return on Equity
SMEs:	Small and Midsize Enterprise
SPSS:	Statistical Package for the Social Sciences
TAM:	Technology Acceptance Model
USSD:	Unstructured Supplementary Service Data
VECM:	Vector Error Correction Model

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ABSTRACT

The increase in competition and changing business environment in banking sector is making banks to turn into financial innovation to improve their competitiveness. Financial innovation is proving to be the most suitable tool to unlock the potential of unpenetrated retail financial markets. When successfully implemented, these innovations can lead to cost savings, which can have a positive impact on a company's financial performance by increasing profitability. The banking sector registered decline in performance in 2020 with profit before tax decreasing by 29.5 percent to Ksh.112.2 billion in December 2020 from Ksh.159.1 billion in December 2019. The objective of the research was to determine the effect of financial innovations on financial performance of commercial banks in Kenya. The theoretical review focused on major theories that included Innovation Diffusion theory, Technology Acceptance Model, and the Resource-Based View theory. The method of descriptive research was employed in this study and data was collected in a form of panel data from the 39 commercial banks in Kenya. The research covered a 5-year period from the year 2018 to the year 2022 from which data was derived. The analysis of this data was conducted using SPSS version 27 and STATA. It was concluded that mobile banking had a positive effect on financial performance of commercial banks in Kenya. This is because mobile banking provides customers with convenient and accessible services improving overall customer satisfaction and loyalty. ATM banking had a positive effect on financial performance of commercial banks in Kenya. This is because ATM operate 24/7 without the need for extensive staff, significantly reducing overhead costs related to staffing, utilities and maintaining physical branches. Agency banking had a positive effect on financial performance of commercial banks in Kenya. This is because agency banking enables banks to reach customers in remote or underserved areas where establishing physical branches may not be feasible or cost-effective. Internet banking had a positive effect on financial performance of commercial banks in Kenya. This is because online banking encourages banks to continually improve their digital platforms, introducing new features, functionalities, and innovative services. Bank size had a positive effect on financial performance of commercial banks in Kenya. This is because larger banks might have more resources to invest in advanced risk management technologies and processes contributing to better risk mitigation and financial stability. The study recommends that commercial banks in Kenya should collaborate with Fintech companies and technology partners to leverage innovative solutions. Commercial banks in Kenya should integrate advanced features such as mobile-based authentication for smoother and faster transactions. Commercial banks in Kenya should focus on expanding the network of agents to reach more remote or underserved areas. The commercial banks in Kenya should continuously update and innovate the internet banking platform by incorporating new features, services, and technologies. The commercial banks in Kenya should ensure that they enjoy economies of scale, and this can be achieved through merges and acquisitions as this will enhance synergy and which in turn may reduce operational costs of the banks.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Financial innovations have become a hallmark of the modern banking industry, revolutionizing the way commercial banks operate and serve their customers. Financial innovations often involve the integration of technology and automation into banking operations. This leads to improved operational efficiency, reduced manual work, and significant cost savings (Shetty & Nikhitha, 2022). Financial innovations enhance the customer experience by providing convenient, personalized, and accessible banking services. This improved customer engagement not only leads to increased customer loyalty but also provides opportunities for cross-selling and upselling financial products (Srivastava, Kishore & Dhingra, 2021). Financial innovations help banks better assess and manage risks and effective risk management reduces loan defaults, lowers credit-related losses and improves overall financial stability. Commercial banks that embrace financial innovations gain a competitive edge in the market. They can respond quickly to changing customer preferences and market trends, adapt to regulatory changes, and create innovative solutions that attract a broader customer base. This competitive advantage can result in higher market share and increased financial performance (Preziuso, Koefer & Ehrenhard, 2023).

This study will be anchored on Innovation Diffusion theory, Technology Acceptance Model and the Resource-Based View theory. Everett Rogers was the key proponent of the Innovation Diffusion Theory in 1983. Financial innovations need to align with the existing financial infrastructure, regulations and investor preferences. Innovations that are compatible with existing regulatory frameworks and risk management practices are more likely to diffuse successfully (Rogers, 2004). The Technology Acceptance Model (TAM)

was developed by Fred Davis in 1985 and the model is used to predict and explain individuals' acceptance and adoption of new technologies (Davis, 1985). The model consists of two key components which are Perceived Usefulness and Perceived Ease of Use. The Resource-Based View theory proponent was Jay Barney in 1991 who indicated that firms can achieve and sustain a competitive edge by leveraging unique and valuable resources that are difficult for competitors to imitate or replicate (Barney, 2001).

The financial performance of commercial banks in Kenya is a critical aspect of the country's economy, reflecting the health and stability of its banking sector. The banking sector registered decline in performance in 2020 with profit before tax decreasing by 29.5 percent to Ksh.112.2 billion in December 2020 from Ksh.159.1 billion in December 2019 (Central Bank Report, 2020). The banking sector registered strong performance in 2021, with profit before tax increasing by 75.7 percent to Ksh.197.0 billion in December 2021. The banking sector performance improved in year 2022 by 22.0 percent to Ksh.240.4 billion in December 2022 (Central Bank Report, 2022). The number of Automated Teller Machines (ATMs) decreased by 1.4 percent to 2,412 in December 2020 from 2,459 in December 2019 and they decreased to 2,301 in December 2022, from 2,366 in December 2021. As at December 2019, commercial banks recorded 67,314 bank agents, they increased to 72,617 in December 2021 and 78,371 bank agents in December 2021 (Central Bank Report, 2022). In the FY2020/21 the Kenya Electronic Payment and Settlement System (KEPSS) transactions were valued at KSh 34.7 trillion while in the FY2021/22 they were valued at KSh 35.5 trillion. The value of mobile banking transactions increased from Ksh 382.9 Billion in year 2019 to Ksh 605.7 Billion in year 2020 and Ksh 622 Billion in year 2021 and Ksh 708 Billion in year 2022 (Central Bank Report, 2020).

1.1.1 Financial Innovations

Financial innovations refer to the development and implementation of new financial products, services, processes, or technologies that aim to improve the efficiency, accessibility and effectiveness of financial systems and services (Tufano, 2003). Financial innovations also refer to the creation and implementation of novel financial products, services, processes, or technologies within the financial industry (Frame & White, 2004). These innovations are aimed at improving and modernizing financial systems, services and operations. Financial innovations also refer to the creation, development and implementation of new financial products, services, technologies, or processes that aim to improve and transform the way financial transactions, services and operations are conducted within the financial industry (Goetzmann & Rouwenhorst, 2005).

Financial innovations often lead to streamlined processes, reduced administrative overhead, and improved operational efficiency within financial institutions. This efficiency can result in cost savings, which can be passed on to customers or shareholders. Financial innovations can help promote financial inclusion by providing banking and payment solutions to previously unbanked or underbanked populations. Innovations often lead to improved risk assessment, monitoring, and management in financial transactions. This can help institutions and individuals better navigate risks associated with investments, loans, and other financial activities (Moki, Kanini & Kinyua, 2019). Financial innovations contribute to a better customer experience by providing more convenient, user-friendly and personalized solutions. Financial innovations can stimulate economic growth by facilitating access to capital for businesses, encouraging entrepreneurship, and driving investment in emerging sectors (Srivastava, Kishore & Dhingra, 2021).

The measures of financial innovations in commercial banks include mobile banking, ATM machines, agency banking and internet banking (Foroughi, Iranmanesh & Hyun, 2019; Khan & Abdullah, 2019; Margaret & Ruth, 2019; Arif, Aslam & Hwang, 2020). Mobile banking is a digital banking service that allows customers to perform various financial transactions and manage their bank accounts using mobile devices, such as smartphones and tablets (Foroughi, Iranmanesh & Hyun, 2019). ATM is a self-service banking terminal that allows individuals to perform various financial transactions without the need for human tellers or visiting a physical bank branch (Khan & Abdullah, 2019). Agency banking is a banking model that extends the reach of traditional banks and financial institutions by allowing authorized agents or third-party entities to offer banking and financial services on their behalf (Margaret & Ruth, 2019). Internet banking, also known as online banking or e-banking, is a digital platform provided by banks and financial institutions that allows customers to perform various financial transactions and manage their banking accounts through the internet (Arif, Aslam & Hwang, 2020).

1.1.2 Financial Performance

According to Englund and Graham (2019), financial performance refers to its ability to successfully achieve set objectives by efficiently utilizing available physical and human resources. It indicates the level of a firm's operations over a specific period, expressed in terms of returns and losses during that duration (Fadun & Oye, 2020). Financial performance assesses an organization's achievements in monetary terms based on its goals, policies, and operations. It reflects the financial health of the organization and can be compared with similar firms in the same industry (Fatihudin & Mochklas, 2018). Financial performance is a primary objective for all organizations, including commercial banks. A well-performing banking industry is essential for maintaining the stability of the economy,

as poor financial performance hampers banks' ability to absorb negative shocks, consequently affecting their solvency (Matayo & Muturi, 2018).

Financial performance enables commercial banks to generate resources from their operations over a specific period (Odhiambo, 2019). Positive financial performance rewards shareholders for their investments, fostering additional investment and contributing to economic growth (Mishra & Mohanty, 2018). Improved financial performance allows lenders to recover costs or generate profits, creating institutions capable of sustaining themselves without continued reliance on government subsidies or donor funds (Wamalwa & Mukanzi, 2018). The evaluation of banks' financial performance serves various purposes, including assessing their operational results and overall financial condition, measuring asset quality, management efficiency, and goal achievement. It also helps ascertain their earnings quality, liquidity, capital adequacy, and level of banking services (Fatihudin & Mochklas, 2018).

Key measures of financial performance include return on assets (ROA), return on equity (ROE), and Net Interest Margin (NIM) (Ngunyu, 2019). From a shareholder's perspective, a firm's financial performance is assessed based on how much better off the shareholder is at the end of the period compared to the beginning (Fatihudin & Mochklas, 2018). Various financial measures, such as profit after tax, ROA, ROE, earnings per share, and generally accepted market value ratios, can be employed to assess financial performance (Echwa & Atheru, 2020). In the context of commercial banks, financial performance is commonly measured in terms of ROA and ROE (Odhiambo, 2019). The study will use ROA as a measure of financial performance. This is because it measures how effectively a company is using its assets to generate profits, considering the relationship between net income and total assets (Fatihudin & Mochklas, 2018). ROA also accounts for both equity and asset components providing a well-rounded perspective of profitability (Husna & Satria, 2019).

1.1.3 Financial Innovations and Financial Performance

Katutu (2019) indicated that financial innovations can lead to cost savings for financial institutions. Automation of processes, the use of digital platforms, and streamlined operations can reduce operational costs. This cost efficiency can positively impact financial performance by increasing profitability. Innovative financial products and services can open up new revenue streams. For example, offering innovative investment products or digital payment solutions can attract new customers and generate additional fees or interest income. Okoth and Muia (2020) revealed that financial innovations often enhance the customer experience, making it easier for institutions to attract and retain customers. Satisfied and loyal customers can contribute to increased deposits, lending, and cross-selling opportunities, which can positively affect financial performance.

Financial innovations can help financial institutions stay compliant with changing regulations, reducing the risk of fines or penalties that could negatively impact financial performance (Ruof, 2023). Financial institutions that embrace innovations may gain a competitive advantage and increase their market share. A larger customer base can result in higher revenues and improved financial performance. Being perceived as an innovative and forward-thinking institution can enhance a bank's reputation and market position. This can attract both customers and investors, further bolstering financial performance (Wang, Xiuping & Zhang, 2021). Financial innovations can improve the efficiency of capital allocation by enabling better assessment of investment opportunities and risks. Effective capital allocation can lead to higher returns and better financial performance. Financial innovations that promote financial inclusion, such as mobile banking for underserved populations, can expand the customer base and contribute to economic growth, positively influencing financial performance (Vucinic, 2020).

Financial innovations allow institutions to adapt to changing market dynamics and consumer preferences. Financial innovations that enhance the customer experience, such as user-friendly mobile banking apps or personalized financial advisory services, can contribute to higher customer satisfaction and loyalty. Satisfied customers are more likely to continue doing business with the company, positively impacting financial performance. Staying ahead of these trends can help institutions remain competitive and financially resilient (Broby, 2021). Financial innovations may provide institutions with tools and strategies to better navigate economic downturns and financial crises, preserving financial performance during challenging times. Innovations often enable companies to adapt to changing market conditions and customer preferences. Being flexible and responsive to these changes can help companies maintain or improve their financial performance in dynamic environments (Moki, Kanini & Kinyua, 2019).

1.1.4 Commercial Banks in Kenya

Commercial banks hold a crucial position in Kenya's financial system and economy, as they offer a diverse range of financial services to individuals, businesses, and other entities. Regulation of the banking sector in Kenya falls under the Central Bank of Kenya (CBK), responsible for licensing, supervision, and regulation of commercial banks. The CBK sets prudential guidelines and monitors compliance to ensure the stability and soundness of the banking system. As of December 31, 2022, the Kenyan banking sector consisted of 42 institutions, comprising 38 commercial banks and 1 mortgage finance company, as reported by the Central Bank (2022). The sector's asset base experienced a growth of 10.0 percent, reaching approximately Ksh. 6.6 trillion in 2022 from Ksh. 6.0 trillion in 2021. The capital adequacy ratio of the sector stood at 19.0 percent in 2022, showing a slight decline from 19.5 percent in 2021. Additionally, profit before tax witnessed a significant increase of 22.0

percent, amounting to Ksh. 240.4 billion in 2022, compared to Ksh. 197.0 billion in 2021 (Central Bank Report, 2022).

Financial innovations in commercial banks in Kenya have been instrumental in transforming the banking sector, enhancing financial inclusion, and improving access to banking services (Margaret & Ruth, 2019). Kenya, often regarded as one of the leaders in financial innovation in Africa, has seen the adoption of various innovative solutions. Commercial banks in Kenya have integrated mobile banking into their services, allowing customers to access their accounts, transfer money, and pay bills via mobile apps and USSD codes (Nguena, 2019). Commercial banks have leveraged agency banking to extend their services to underserved areas. Commercial banks have also seen an increase in the number of ATMs in the country and the value of transactions in regard to internet banking (Mang'ana, 2022). These financial innovations have not only improved the customer experience but have also contributed to the growth and development of Kenya's banking sector. They have expanded financial inclusion, encouraged savings and investments, and facilitated access to credit for individuals and businesses across the country (Moki, Kanini, & Kinyua, 2019).

1.2 Research Problem

The banking sector environment is ever changing due to the accelerated changes in the technological innovation taking place in the world and therefore affecting the financial sector and this has created research interest in financial innovation (YuSheng & Ibrahim, 2020). The increase in competition and changing business environment in banking sector is making banks to turn into financial innovation to improve their competitiveness. Financial innovation is proving to be the most suitable tool to unlock the potential of unpenetrated retail financial markets. When successfully implemented, these innovations

can lead to cost savings, which can have a positive impact on a company's financial performance by increasing profitability (Dwivedi, Alabdooli & Dwivedi, 2021). However, poorly implemented innovations or those that fail to meet market needs can lead to financial losses and negatively impact performance. Thus, as financial institutions increasingly adopt financial innovative, understanding the precise relationship between these innovations and their impact on financial performance is of importance (Mishra & Mohanty, 2018).

The banking sector registered decline in performance in 2020 with profit before tax decreasing by 29.5 percent to Ksh.112.2 billion in December 2020 from Ksh.159.1 billion in December 2019 (Central Bank Report, 2020). The banking sector registered strong performance in 2021, with profit before tax increasing by 75.7 percent to Ksh.197.0 billion in December 2021. The banking sector performance improved in year 2022 by 22.0 percent to Ksh.240.4 billion in December 2022. The number of Automated Teller Machines (ATMs) decreased by 1.4 percent to 2,412 in December 2020 from 2,459 in December 2019 and they decreased to 2,301 in December 2022, from 2,366 in December 2021 (Central Bank Report, 2022). As at December 2019, commercial banks recorded 67,314 bank agents, they increased to 72,617 in December 2021 and 78,371 bank agents in December 2021. In the FY2020/21 the Kenya Electronic Payment and Settlement System (KEPSS) transactions were valued at KSh 34.7 trillion while in the FY2021/22 they were valued at KSh 35.5 trillion. The value of mobile banking transactions increased from Ksh 382.9 Billion in year 2019 to Ksh 605.7 Billion in year 2020 and Ksh 622 Billion in year 2021 and Ksh 708 Billion in year 2022 (Central Bank Report, 2022).

Studies have been carried out in regard to financial innovations and financial performance; Akani and Tony–Obiosa (2020) studied effects of financial innovations on the profitability of deposit money banks in Nigeria. It was revealed that ATM and electronic fund transfer had negative relationship with return on equity while internet banking, mobile banking and

investment on information communication technology had positive relationship with return on equity. However, a gap exists as the above study context was Nigeria while a conceptual gap exists as measure of financial performance was return on equity. Alawi et al. (2022) focused on the impact of financial innovation and institutional quality on financial development in emerging markets. It was noted that better financial innovation increases financial development, whereas low institutional quality in an emerging market can deteriorate financial development. However, a gap exists as the above study context was in 17 countries while a conceptual gap exists as focus was on financial development.

Locally, Ringera (2018) studied effects of financial innovations on efficiency of savings and credit cooperative organizations in Meru County and revealed that mobile banking and internet banking were crucial in enhancing the efficiency in the organizations. However, a contextual gap exists as focus was on credit cooperative organizations in Meru County and not commercial banks in Kenya. Ndungu and Muturi (2019) studied effect of diversification on financial performance of commercial banks in Kenya. It was concluded that increased formulation and implementation of additional diversification strategies resulted in significant improvement in the financial performance of the commercial banks. However, a conceptual gap exists as focus was on diversification and not financial inclusion. Due to the existing gaps, the study aimed to bridge the research gap by answering the following question: what is the effect of financial innovations on financial performance of commercial banks in Kenya?

1.3 Research Objective

The objective of the research was to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

1.4 Value of the Study

The study will help in understanding relevance of Innovation Diffusion theory which is applied in the context of financial innovation in helping to understand how new financial products, services and practices spread within the financial industry and among market participants. The study will help in understanding relevance of Technology Acceptance Model (TAM) since understanding users' perceptions of how a financial innovation adds value to their financial activities is essential. The ease with which users can interact with a financial innovation plays a significant role in adoption. The study will support Resource-Based View Theory (RBV) which is relevant to this study since firm's unique and valuable resources and capabilities are primary drivers of competitive advantage and this advantage can ultimately lead to improved financial performance.

The study will help the policy makers in the banking industry come up with financial innovations strategies so as to enhance the performance of commercial banks in the current changing technology dynamic. Financial innovation also often involves the use of technology, which can be vulnerable to cyberattacks. The policy makers will thus appreciate cyberattacks and other data security fraud and thus come up with measures to minimise the fraud.

The study will be relevant to the commercial banks in Kenya as it will help identify the best financial innovations to adopt and invest resources in ensuring that they are effective so as to enhance their financial performance. The commercial banks will also be able to appreciate the challenges that come with financial innovations and in particular fraud and thus come up with security measures to control the fraud.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter sought to determine the effect of financial innovations on financial performance of commercial banks in Kenya. The chapter included an empirical review of research, conceptual framework and a summary of the literature study.

2.2 Theoretical Review

The theoretical review focused on major theories that included Innovation Diffusion theory, Technology Acceptance Model and the Resource-Based View theory.

2.2.1 Innovation Diffusion Theory

Everett Rogers was the key proponent of the Innovation Diffusion Theory in 1983. The theory indicates that financial innovations must offer clear benefits over existing practices to gain traction. Innovations that provide higher returns, lower costs, or improved risk management are more likely to be adopted (Rogers & Williams, 1983). Financial innovations need to align with the existing financial infrastructure, regulations and investor preferences. Innovations that are compatible with existing trading platforms, regulatory frameworks and risk management practices are more likely to diffuse successfully (Rogers, 2004). The complexity of financial innovations can influence their adoption. Innovations that are easy to understand and implement have a higher chance of being adopted (Tufano, 2003).

The critique of Innovation Diffusion theory is that it focuses heavily on individual attributes, such as innovators, early adopters, and laggards, without giving enough attention to social and contextual factors that influence adoption decisions (Ho, 2022). The Innovation Diffusion theory helps organizations understand how to promote and facilitate

the adoption of innovations, tailor communication strategies and anticipate the challenges and barriers to diffusion within specific target populations or markets. The Innovation Diffusion Theory was applied to the context of financial innovation, helping to understand how new financial products, services and practices spread within the financial industry and among market participants (Anderloni, Llewellyn & Schmidt, 2009).

2.2.2 Technology Acceptance Model

The Technology Acceptance Model (TAM) was developed by Fred Davis in 1985. TAM is a widely recognized and influential model used to predict and explain individuals' acceptance and adoption of new technologies (Davis, 1985). The model consists of two key components which are Perceived Usefulness and Perceived Ease of Use. Perceived Usefulness refers to the user's perception of how much using the technology will enhance their performance and productivity (Silva, 2015). If users believe that a technology will be beneficial and improve their efficiency, they are more likely to accept and use it. Perceived Ease of Use relates to the user's perception of how easy it is to learn and use the technology. Technologies that are perceived as user-friendly and simple to navigate are more likely to be accepted and adopted (Soon, Lee & Boursier, 2016).

The critique of the theory is that TAM assumes a linear and direct relationship between perceived ease of use (PEOU), perceived usefulness (PU) and behavioral intention to use (BI). In reality, technology adoption decisions can be influenced by a multitude of factors, including social, organizational and contextual variables which TAM does not account for (Salovaara & Tamminen, 2009). This theory was relevant to this study since understanding users' perceptions of how a financial innovation adds value to their financial activities is essential. The ease with which users can interact with a financial innovation plays a significant role in adoption. By understanding users' perceptions and attitudes, financial

institutions and technology providers can tailor their offerings to meet user needs and preferences, ultimately driving higher rates of adoption and successful integration of financial innovations.

2.2.3 Resource-Based View Theory

The Resource-Based View theory proponent was Jay Barney in 1991 who indicated that firms can achieve and sustain a competitive edge by leveraging unique and valuable resources that are difficult for competitors to imitate or replicate (Barney, 2001). The theory suggests that resources are valuable to the extent that they enable a firm to create value for customers by addressing their needs and preferences more effectively than competitors. Value creation is a fundamental driver of competitive advantage, as it leads to customer loyalty and market success (Nath, Nachiappan & Ramanathan, 2010). Firms need to develop dynamic capabilities to adapt, change, and renew their resources and capabilities over time. Dynamic capabilities allow firms to respond to changes in the competitive environment and sustain their advantage (Liang, You & Liu, 2010).

RBV assumes that resources and capabilities are heterogeneous across firms, meaning that each firm possesses unique resources. In reality, many resources can be imitated or replicated by competitors over time, diminishing their value (Kraaijenbrink, Spender & Groen, 2010). The RBV was relevant to this study since firm's unique and valuable resources and capabilities are primary drivers of competitive advantage and this advantage can ultimately lead to improved financial performance. By leveraging and managing these resources effectively, firms can achieve competitive advantages that translate into enhanced profitability, growth and long-term success.

2.3 Determinants of Financial Performance

This section focused on determinant of financial performance in specific to commercial banks.

2.3.1 Financial Innovation

Offering innovative financial products and services, such as mobile banking, ATM machines, agency banking and internet banking can enhance a bank's competitiveness and increase its fee-based income (Mang'ana, 2022). Financial innovations often involve the automation of banking processes and the use of advanced technology. This can lead to cost reductions through streamlined operations, reduced paperwork, and increased operational efficiency. Lower operational costs can positively impact a bank's profitability and financial performance (Vucinic, 2020). Financial innovations often aim to enhance the customer experience by providing convenient, user-friendly, and customized banking solutions. Satisfied customers are more likely to remain loyal to a bank (Katutu, 2019). Banks that embrace financial innovation can gain a competitive edge in the market. They can differentiate themselves by offering unique products or services that meet specific customer needs, making it difficult for competitors to replicate their offerings (Malit, Nelson & Scholastica, 2023).

2.3.2 Bank Size

The size of a commercial bank, often measured by its total assets, can significantly impact its financial performance (Chodorow-Reich et al., 2022). Larger banks benefit from economies of scale, allowing them to spread fixed costs over a larger asset base which lower average costs of operation and potentially higher profitability. Larger banks have more diversified operations including a wider range of products, services and geographic

presence. This diversification can help mitigate risks associated with economic fluctuations in specific regions or sectors (Afrifa, Ggyapong & Zalata, 2019). Larger banks often have greater lending capacity due to their larger capital base. This allows them to extend more loans, earn interest income, and generate higher revenue. Larger banks might have more resources to invest in advanced risk management technologies and processes contributing to better risk mitigation and financial stability (Chodorow-Reich et al., 2022).

2.3.3 Asset Quality

Asset quality is a critical factor that significantly impacts the performance and overall health of commercial banks (Al-Homaidi et al., 2020). Asset quality refers to the quality and soundness of the assets held by a bank, including loans, investments, and other earning assets. A strong asset quality contributes to financial stability, profitability, and investor confidence, while poor asset quality can lead to financial distress and adverse consequences. Sound asset quality contributes to higher profitability (Nguyen, 2022). When loans and investments are of high quality, the bank's interest income is more secure, and the need for provisions and write-offs due to non-performing assets (NPAs) is reduced, leading to improved net earnings. A bank with high-quality assets demonstrates prudent lending decisions, comprehensive credit risk assessment, and appropriate loan monitoring mechanisms (Al-Homaidi et al., 2020).

2.3.4 Capital Adequacy

Capital adequacy is a crucial regulatory requirement and financial metric that directly influences the financial performance and stability of commercial banks. It refers to the proportion of a bank's capital, primarily shareholders' equity and retained earnings, relative to its risk-weighted assets (Baldwin, Alhalboni & Helmi, 2019). Adequate capital reduces the risk of insolvency and enhances the bank's ability to withstand adverse events. Capital

adequacy determines a bank's lending capacity. Higher capital ratios allow banks to lend more since they can take on a proportionally larger amount of risk-weighted assets. Higher capital adequacy ratios enhance a bank's financial stability by providing a cushion against potential losses. Banks with strong capital adequacy ratios may be perceived as less risky by creditors. Consequently, they can borrow funds at lower interest rates, reducing their borrowing costs (Anggari & Dana, 2020).

2.3.5 Risk Management

Risk management in commercial banks is a vital practice aimed at identifying, assessing, and mitigating potential risks that can impact the financial stability and reputation of these institutions (Rehman, Mohamed & Ayoup, 2019). Commercial banks face a range of risks, including credit risk, market risk, operational risk and liquidity risk. Commercial banks assess borrowers' creditworthiness and the potential for default before extending loans, thereby managing credit risk. Market risk is managed by monitoring fluctuations in interest rates, foreign exchange rates and other market variables to ensure that the bank's investment portfolio remains balanced and aligned with its risk tolerance. Operational risk is mitigated through robust internal controls, audits and contingency plans. Compliance with regulatory requirements is also a fundamental aspect of risk management, ensuring that banks operate within legal frameworks (Altaf et al., 2022).

2.4 Empirical Studies

Tahir et al. (2018) focused on effect of financial innovation on performance of state bank in Pakistan. Secondary data issued by the State Bank of Pakistan for the period 2007-2016 is used. Through the unit root test, the issue of stationary imperfection connected with unsynchronized arrangement information was settled before using multiple regression models. The result of the study indicated a significant positive relationship between

transactions on the Web/Internet on efficiency ratio (ER). But the results for Automated Teller Machines (ATM), Point of Sale (POS), and Mobile Banking (MOB), were found to be statistically non-significant. Furthermore, the Granger impact appraisal revealed that no innovative products had a critical effect on ER, but they did have a significant effect on the value of transactions. A contextual gap exists as the above study was in Pakistan while the present study uses panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

Centobelli, Cerchione and Singh (2019) studied the impact of leanness and innovativeness on environmental and financial performance from Indian SMEs. A hypothesized model was empirically tested using data from 374 Indian manufacturing SMEs. The results of the study were consistent with the hypothesized model and showed a significant positive impact of both leanness and innovativeness on financial and environmental performance. In addition, the results showed the importance of considering simultaneously leanness and innovation since leanness does not have only a direct effect on environmental and financial performance, but also an indirect effect mediated by innovation. A contextual gap exists as the above study was in Indian SMEs while a conceptual gap exists as the study focused on leanness and innovativeness on environmental and not financial innovation. A methodology gap exists as the study focused on empirical data while the present study uses panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

Jamai et al. (2021) studied the impact of innovation on financial and non-financial performance of SMES in Belgium. A total of 47 studies were selected to examine the correlation between innovation type and performance and identify the key factors that strongly impact the firm growth per industry. Findings demonstrate the difference in innovation impact according to the targeted industrial sector and show which type could be

more beneficial to enhance firm performance. The results revealed that product innovation influences strongly firm performance in the manufacturing sector, while marketing and product innovation are the variables that most impact the growth of agro-food firms. A contextual gap exists as the above study was in SMES in Belgium while a conceptual gap exists as the study focused on non-financial performance. A methodology gap exists as the study focused on review of past studies while the present study uses panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

Baker et al. (2023) studied the impact of financial technology on improvement of banks' financial performance in Jordan and the United Arab Emirates. The study population consists of commercial banks listed on the Amman Stock Exchange and Abu Dhabi Securities Exchange and includes financial information and data from 2012 to 2020. A total of 115 questionnaires were distributed. It was revealed that FinTech had permeated various financial areas, including deposits, payments and investments, credit and capital raising. The results showed that FinTech has a positive effect on both total deposit and net profits. The study recommended that banks be encouraged to adopt inclusive strategies to attain sustainable development. A contextual gap exists as the above study was in Jordan and the United Arab Emirates. A methodology gap exists as the study used questionnaires while the present study uses secondary panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

YuSheng and Ibrahim (2020) studied innovation capabilities, innovation types and performance from the banking sector of Ghana. Data was obtained from 450 respondents comprising bank employees and customers. An exploratory factor analysis, confirmatory factor analysis, and structural equation modeling were used to analyze the data via SPSS V.22. Findings revealed that the innovation dimensions that contribute to bank innovation are organizational, product, process and marketing innovations. The study further revealed

a direct and positive relationship between innovation dimensions and bank performance. In addition, findings from this study showed a positive relationship between innovation capability and firm performance. A contextual gap exists as the above study was in Ghana while a conceptual gap exists as the study focused on innovation capabilities and innovation types and not financial innovation. A methodology gap exists as the study focused on primary data while the present study uses secondary panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

Tsegaye (2021) studied effect of financial innovation on the demand for money in Ethiopia annual data ranging from 1994 to 2018. The empirical results showed that using the VECM coefficient estimation approach financial innovation establishes a positive relationship but not significant on both money demands both in the short-run and long run. Despite this insignificant, inclusion of financial innovation into the money demand functions submits the well-defined specifications of money demand in Ethiopia. Income and exchange rates had positive and significant effects on both money demands while nominal interest rate and inflation rate had negative and significant effects on both money demands in long run. A contextual gap exists as the above study was in Ethiopia while a conceptual gap exists as the study focused on financial innovation and demand for money and not financial innovation and financial performance. A methodology gap exists as the study focused on empirical data while the present study uses secondary panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

Musa and Abubakar (2022) examined the effect of financial innovation on efficiency of deposit money banks (DMBs) in Nigeria. The study used an ex-post facto research design. The population comprised of the 13 DMBs listed on the Nigeria Exchange Group (NGX). The study collected data from companies' financial statements, central bank of Nigeria (CBN) statistical bulletin, and the NGX fact book. Descriptive and inferential statistics,

correlation tests, unit root tests and regression analysis were used to analysis the data. Findings show that financial innovation (agency banking) had a positive and significant effect on the performance of DMBs in Nigeria in terms of efficiency while bank size had a negative and insignificant effect on the efficiency of DMBs in Nigeria. A contextual gap exists as the above study was in Nigeria while a conceptual gap exists as the study was limited to efficiency.

Obadia and Kumungunyi (2022) studied the influence of mobile banking on financial performance of listed tier 1 commercial banks in Kenya. Primary data was collected by questionnaires while secondary data was extracted from the annual financial reports of the CBK. Analysis was done with the help of SPSS version 21 and Microsoft excel 2016. The study concluded that mobile banking had a negative but insignificant relationship with financial performance. However, mobile banking influenced reduction of operational costs. The adoption of mobile banking also had a high potential of improving financial performance and therefore the potential of maximizing shareholders' wealth. A conceptual gap exists as the study was limited to mobile banking as a measure of financial innovation. The study also used questionnaires while the present study uses secondary panel data.

Njeri (2022) focused on effect of Basel II operational risk management and financial performance of commercial banks in Kenya. The study utilized both primary and secondary data. The study adopted descriptive research design while data was analysed using SPSS version 22 and STATA version 15. The results indicated that financial fraud cost had a significant negative effect on financial performance of commercial banks while regulatory non-compliance cost, business disruption & utility outage cost, operational risk legal liability cost and employment practices & workplace safety non-compliance costs all had negative but not significant effect. A conceptual gap exists as the study focused on operational risk management and financial performance and not financial innovation and

financial performance. The study also used questionnaires while the present study uses secondary panel data.

Kirimi, Kariuki and Ocharo (2022) studied financial soundness and performance of commercial banks in Kenya. The study used dynamic panel model to analyze data from commercial banks for the period 2009 to 2020. Generalized method of moments results established that financial soundness had a statistically significant effect on NIM, ROA and ROE. It was also found that asset quality and earning quality had a statistically significant effect on net interest margin. In addition, management efficiency had significant effect on ROE. However, the study established that capital adequacy, asset quality, earning quality and liquidity had a statistically insignificant effect on ROA and ROE respectively while capital adequacy, management efficiency and liquidity had statistically insignificant effect on NIM. A conceptual gap exists as the study focused on financial soundness and financial performance and not financial innovation and financial performance.

Malit, Nelson and Scholastica (2023) studied effect of financial innovations on banks' loan portfolio in Kenya. The study adopted Positivism philosophy and correlational research design. The target population for the study comprised of all of the 42 commercial banks where secondary data was used for the period 2007 to 2017. The data was analyzed using fixed effect and pooled regression of panel data analysis. The findings of the study indicated that there is positive and significant effect between financial innovation and loan portfolio of commercial banks. The study concluded that commercial banks have implemented technological innovations in various areas such as electronic fund transfer (EFT), Branch networking and Mobile banking which have improved the banks' loan portfolios. A conceptual gap exists as the study focused on financial innovations and banks' loan portfolio while the present study uses secondary panel data to determine the effect of financial innovations on financial performance of commercial banks in Kenya.

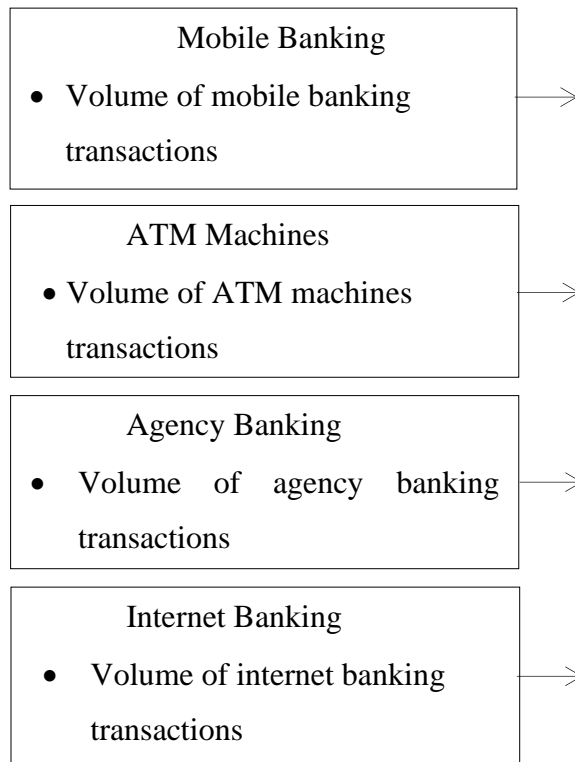
2.5 Summary of Literature Review

Globally, Tahir et al. (2018) study in Pakistan indicated a significant positive relationship Web/Internet on efficiency ratio (ER) but the results for ATM, POS, and Mobile Banking (MOB), were found to be statistically non-significant. Jamai et a. (2021) study in Belgium revealed that product innovation influenced strongly firm performance. Tsegaye (2021) study in Ethiopia revealed that income and exchange rates had positive and significant effects on both money demands. Musa and Abubakar (2022) study in in Nigeria indicated agency banking had a positive and significant effect on the performance while bank size had a negative and insignificant effect. A gap exists in the above studies as the focus was not on the effect of financial innovations on financial performance of commercial banks in Kenya.

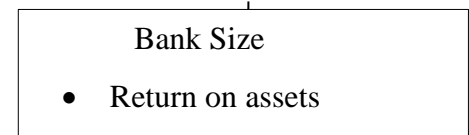
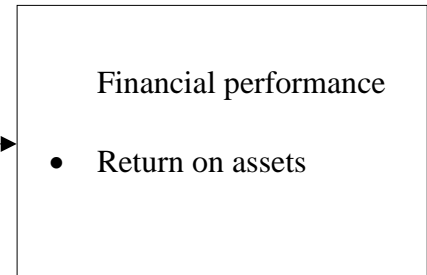
Localaly, Obadia and Kumungunyi (2022) indicated that mobile banking had a negative but insignificant relationship with financial performance. Njeri (2022) indicated that operational risk management had a positive effect on financial performance of commercial banks. Kiriimi, Kariuki and Ocharo (2022) found that asset quality and earning quality had a statistically significant effect on financial performance. Malit, Nelson and Scholastica (2023) indicated that there is positive and significant effect between financial innovation and loan portfolio of commercial banks. A gap exists in the above studies as the focus was not on the effect of financial innovations on financial performance of commercial banks in Kenya.

2.6 Conceptual Framework

Independent Variables



Dependent Variables



Control Variable

Figure 2.1: Conceptual Framework

Financial innovations, such as mobile banking, ATM machines, agency banking and internet banking can help banks reduce operational costs by automating processes and reducing the need for physical infrastructure. This cost reduction can positively impact profitability. Financial innovations can create new revenue streams for banks. For example, the introduction of new financial products and services, like mobile banking apps, can attract new customers and generate additional fee-based income. Improvements in financial innovations can provide customers with more convenient and efficient banking services. A better customer experience can lead to increased customer retention and loyalty, translating

into higher revenues. Banks that adopt financial innovations early can gain a competitive edge in the market. Offering innovative products and services can attract more customers and maintain a larger market share. Through innovations like automation and data analytics, banks can improve their internal processes and decision-making. Enhanced efficiency and productivity can lead to cost savings and improved financial performance.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlined the methodological approach that was employed in this study and research design, data collection, data analysis and operationalization of variables.

3.2 Research Design

Kothari (2014) refers to research design as a structure employed to offer suitable answers to research inquiries. The method of descriptive research was employed in this study due to its capability to efficiently, conveniently and effectively gather extensive data from a significant population through panel data (Saunders, Lewis & Thornhill, 2016).

3.3 Data Collection

The researcher acquired data through the utilization of a data collection sheet, gathering secondary data. The sources of secondary data were drawn from statistical Central Bank of Kenya (CBK) Bank Supervision Reports. The data collected was in a form of panel data from the 39 commercial banks in Kenya. The research covered a 5-year period from the year 2018 to the year 2022 from which data was derived. The data was used to ensure that there are enough data points for the research so as to ensure that the changes that have occurred in the commercial banks are accounted for.

3.4 Data Analysis

The data analysis tools employed in this study aim to provide insights into the research questions, including the exploration of the effect of financial innovations on financial performance of commercial banks in Kenya. The gathered data underwent processes of

editing, sorting, and coding to ensure its quality and accuracy. The analysis of this data was conducted using SPSS version 27 and STATA.

3.4.1 Diagnostic Tests

3.4.1.1 Test for Autocorrelation

Given the utilization of time series data, the examination of autocorrelation will be deemed essential. Autocorrelation would be present if the null hypothesis is upheld, whereas its absence would be indicated if the alternative hypothesis is favored. If the null hypothesis is supported, it suggests a connection or covariance among the error terms for the parameters. To evaluate autocorrelation, the Breusch Godfrey test was employed (Gujarati, 2014).

3.4.1.2 Heteroscedasticity

Detection of heteroscedasticity does not impact the impartiality or linear relationship of regression coefficients. Heteroscedasticity arises when the variability of the error term differs across independent variables. To assess the presence of heteroscedasticity in the data, the Breusch-Pagan test was employed (Gujarati, 2014).

3.4.1.3 Multi-collinearity

Multicollinearity arises when there is a linear correlation among independent variables, leading to infinite standard errors (Gujarati, 2014). The researcher was employ the VIF test to ascertain whether there is substantial and concerning evidence of multicollinearity.

3.4.1.4 Test for Normality

Before conducting a regression analysis, it is anticipated that the research data should adhere to a normal distribution. Non-normal distribution of research data can result in

estimates that are both biased and ineffective. The Shapiro-Wilk test was utilized to assess data normality.

3.4.2 Analytical Model

The regression model took the form of a multivariate model, as depicted by the equation provided.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y = Financial performance

β_0 - Y intercept

$\beta_1 - \beta_4$ = Measure of the sensitivity of variable X to changes in financial performance

X_1 – Mobile banking; measured by volume of mobile banking transactions.

X_2 - ATM machines; measured by volume of ATM machines transactions.

X_3 – Agency banking; measured by volume of agency banking transactions.

X_4 – Internet banking; measured by volume of internet banking transactions.

X_5 – Bank Size; measured by log of assets.

ε –Error term

3.4.3 Test of Significance

In order to examine the hypothesis and determine if there is sufficient evidence to infer that the independent variables influence the dependent variables, ANOVA was employed, with a confidence level of 95% set. This approach aims to address the limitations associated with the t-test and aims to reveal the relationships between the variables. The t-test was

used to assess the individual significance of the predictor variables. The interpretation of p-values was conducted at a significance level of 5%. If the p-value is less than 0.05, it indicates the variables' significance.

3.5 Operationalization and Measurement of Variables

The table below include operationalization and measurement of variables that include mobile banking, ATM machines, agency banking, internet banking, bank size and financial performance.

Table 3.1: Operationalization and Measurement of Variables

Variable	Type	Measure
Financial performance	Dependent	Return on assets
Mobile Banking	Independent	Volume of mobile banking transactions
ATM Machines	Independent	Volume of ATM machines transactions
Agency Banking	Independent	Volume of agency banking transactions
Internet Banking	Independent	Volume of internet banking transactions
Bank Size	Control Variable	Return on assets

CHAPTER FOUR: DATA ANALYSIS, RESULTS, AND INTERPRETATION

4.1 Introduction

The outcomes and discoveries are thoroughly elucidated in this section, accompanied by their respective interpretations.

4.2 Descriptive Statistics

This study intended to explore the descriptive statistics of its variables, aiming particularly to determine and establish their mean values and standard deviations.

Table 4.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev
Financial performance	195	-37	7.4	0.64	5.1112
Mobile banking	195	41.2	95135.2	10650.9	17492.67059
ATM machines	195	473	219971	29584.73	43738.58166
Agency banking	195	0	420550.1	35232.36	70796.1157
Internet banking	195	46.72	4357.91	704.7826	893.3409
Bank size	195	2882	971353	139656.5	196,000

Descriptive results showed that financial performance as measured by ROA in the 5-year period recorded a mean of 0.64% with the highest at 7.4% and the lowest at -3.7%. The average value of mobile banking transactions was Ksh 10, 651 million with the highest at Ksh 95,135.2 million and the lowest at Ksh 41.2 million. The average value of ATM machines transactions was Ksh 29,584.73 million with the highest at Ksh 21,9971 million and the lowest at Ksh 473 million. The average value of agency banking was Ksh 35,232.36 million with the highest at Ksh 420,550.1 million and the lowest at Ksh 0 million. The average value of internet banking was Ksh 704.7826 million with the highest at Ksh 4,357.91 million and the lowest at Ksh 46.72 million. The average value of total assets was

Ksh 139,656.5 million with the highest at Ksh 971,353 million and the lowest at Ksh 2,882 million.

4.3 Diagnostic Tests for Regression

The study conducted various diagnostic tests that included test for Autocorrelation, Heteroscedasticity, Multi-Collinearity and test for Normality. The tests were conducted to help ensure the validity, reliability and appropriateness of statistical analyses and the conclusions drawn from them.

4.3.1 Test for Autocorrelation

To evaluate autocorrelation, the Breusch Godfrey test was employed to help ensure that time series data and regression models are valid.

Table 4.3: Test for Autocorrelation

lags (p)	chi2	df	prob > chi2
1	4.092	1	0.317

The presence of serial correlation can distort conclusions drawn from various tests, including the Breusch-Godfrey test. In this instance, we cannot reject the null hypothesis, as the dataset's p-value (0.317) surpasses the significance threshold (0.05). These results suggest an absence of serial correlation among the variables, ensuring unbiased parameter estimates and accurate hypothesis tests.

4.3.2 Heteroscedasticity

Breusch-Pagan test was employed to test for Heteroscedasticity to for violations of the assumption of constant error variance. When heteroscedasticity is present, it can lead to biased parameter estimates and incorrect hypothesis tests affecting the validity of the model.

Table 4.4: Heteroscedasticity

Breusch Pagan / Cook Weisberg test for	heteroskedasticity
Ho: Constant variance	
Variables: fitted values of Y	
chi2(1)	= 2.18
Prob > chi2	= 0.3842

To assess for heteroscedasticity, the researchers utilized the Breusch Pagan test. If the chi-squared value surpasses a critical threshold or if the p-value falls below 0.05, it implies rejection of the null hypothesis, indicating the presence of heteroscedasticity. However, the findings indicated a chi-squared value of 2.18, indicating no heteroscedasticity. Moreover, the p-value of 0.3842 exceeded 0.05, confirming the retention of the null hypothesis of homoscedasticity, thereby demonstrating the absence of heteroscedasticity. This indicates that the parameter estimates were not biased, and the hypothesis tests were correct.

4.3.3 Multi-Collinearity

The researcher employed the VIF test to test for Multi-Collinearity since multicollinearity can make it challenging to interpret the individual contributions of independent variables in a regression model.

Table 4.5: Multi-Collinearity

Variable	VIF	1/VIF
X4	4.06	0.246449
X2	3.99	0.25075
X5	3.23	0.309654
X1	2.82	0.354756
X3	2.5	0.399678
Mean VIF	3.32	

The research examined data for multicollinearity, a situation where variance inflates, using the variance inflation factor (VIF). Typically, multicollinearity becomes a concern if the VIF score goes beyond 10 or exceeds the threshold of 0.2. However, in this instance, the overall VIF recorded as 3.52, falling below 10. This suggests the absence of multicollinearity in the research data. It indicates that the independent variables weren't highly correlated, allowing for the clear determination of their individual impacts on the dependent variable.

4.3.4 Test for Normality

The Shapiro-Wilk test was used to test for Normality to assess whether a given dataset follows a normal distribution. Violations of normality assumptions can lead to biased estimates and incorrect inferences.

Table 4.6: Test for Normality

Variable	Obs	W	V	z	Prob>z
Y	195	0.60264	57.989	9.33	0
X1	195	0.9752	3.62	2.956	0.00156
X2	195	0.96058	5.752	4.02	0.00003
X3	195	0.84682	22.354	7.14	0
X4	195	0.93163	9.978	5.286	0
X5	195	0.95567	6.469	4.29	0.00001

To evaluate normality, the researcher used the Shapiro-Wilk test. This test hypothesizes that the population adheres to a normal distribution, and when the p-value falls below 0.05, it rejects this assumption, suggesting the data might be biased. The results showed that financial performance had p value of 0, mobile banking had p value of 0.002, ATM machines had p value of 0, agency banking had p value of 0, internet banking had p value of 0 while bank size had p value of 0. The study thus rejected all the null hypothesis, suggesting these datasets deviate from a normal distribution.

4.4 Correlations Analysis

The research conducted a Pearson Correlation test to assess the degree of association among the variables.

Table 4.7: Correlations Analysis

		Financial performance	Mobile banking	ATM machines	Agency banking	Internet banking	Bank size
Financial performance	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	195					
Mobile banking	Pearson Correlation	.174*	1				
	Sig. (2-tailed)	0.015					
	N	195	195				
ATM machines	Pearson Correlation	.357**	.675**	1			
	Sig. (2-tailed)	0	0				
	N	195	195	195			
Agency banking	Pearson Correlation	.373**	.752**	.602**	1		
	Sig. (2-tailed)	0	0	0			
	N	195	195	195	195		
Internet banking	Pearson Correlation	.416**	.631**	.830**	.605**	1	
	Sig. (2-tailed)	0	0	0	0		
	N	195	195	195	195	195	
Bank size	Pearson Correlation	.526**	.618**	.777**	.598**	.798**	1
	Sig. (2-tailed)	0	0	0	0	0	
	N	195	195	195	195	195	195

After analyzing the data, a positive correlation coefficient emerged between mobile banking and financial performance signified by a correlation factor of 0.174. This relationship was considered statistically significant, indicated by a p-value of 0.015 that was below 0.05. Similarly, a positive correlation coefficient was observed between ATM

machines and financial performance demonstrated by a correlation factor of 0.357 and this relationship was deemed statistically significant, with a p-value of 0 that was below 0.05. Conversely, a positive correlation coefficient was found between agency banking and financial performance presenting a correlation factor of 0.373. This relationship was considered statistically significant, evidenced by a p-value of 0, below 0.05.

Likewise, a positive correlation coefficient emerged between internet banking and financial performance as denoted by a correlation factor of 0.416. This relationship was deemed statistically significant, illustrated by a p-value of 0, below 0.05. Finally, a positive correlation coefficient was observed between bank size and financial performance, with a correlation factor of 0.526. This relationship was deemed statistically significant, as indicated by a p-value of 0, below 0.05.

4.5 Regression Analysis

Regression analysis was conducted so as to establish the relationship between the variables.

4.5.1 Model Summary

The model summary was used to assess the goodness of fit of a regression model so as to understand how well the model's independent variables explain the variation in the dependent variable.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610a	.372	.355	.04105

The R-squared value, known as the coefficient of determination, indicated that 37.2% of financial performance in commercial banks were accounted for mobile banking, ATM machines, agency banking, internet banking and bank size.

4.5.2 Analysis of Variance

ANOVA was conducted to assess whether there were statistically significant differences among the group means.

Table 4.9: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.188	5	0.038	22.358	.000a
	Residual	0.318	189	0.002		
	Total	0.507	194			

At a 5% significance level, the overall model was deemed significant as the computed F-value (22.358) surpassed the critical F-value (value = 2.262). This indicates a substantial impact of mobile banking, ATM machines, agency banking, internet banking and bank size on financial performance. The obtained p-value was 0, falling below 0.05, signifying a significant relationship between financial innovations and financial performance of commercial banks at the 5% significance level.

4.5.3 Coefficients

A multiple regression analysis was conducted to assess whether independent variables had a statistically significant impact on the dependent variable.

Table 4.10: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.141	0.03		4.646	0
	Mobile banking	-0.03	0.006	-0.468	-4.831	0
	ATM machines	-0.006	0.01	-0.07	-0.604	0.547
	Agency banking	0.008	0.002	0.369	4.042	0
	Internet banking	0.008	0.011	0.078	0.67	0.504
	Bank size	0.05	0.009	0.586	5.656	0

$$Y = 0.141 - 0.03X_1 - 0.006X_2 + 0.008X_3 + 0.008X_4 + 0.05X_5$$

From the regression model described above, it was observed that if all independent variables were maintained at zero, ROA would stand at 14.1%. A unit decrease in mobile banking would result to a 3% decrease in ROA while a unit increase in ATM machines would result to a 0.6% decrease in ROA. A unit increase in agency banking would result to a 0.8% increase in ROA while a unit increase in internet banking would result to a 0.8% increase in ROA. A unit increase in bank size would result to a 5% decrease in ROA.

Mobile banking, agency banking and bank size had p values less than 0.05 an indication that the three variables had a significant effect on financial performance. ATM machines and internet banking had p values higher than 0.05 and hence the study didn't reject their specific null hypothesis of an insignificant effect on financial performance.

4.6 Discussion of Findings

A positive correlation coefficient emerged between mobile banking and financial performance of commercial banks signified by a correlation factor of 0.174. This relationship was considered statistically significant, indicated by a p-value of 0.015 that was below 0.05. The findings supported Bochaberi and Job (2021) findings that mobile banking reduces operational costs associated with maintaining brick-and-mortar branches. Transactions conducted through mobile apps or online platforms are more cost-effective than those carried out in physical branches, contributing to higher profitability. Mohamed, (2019) also indicated that mobile banking provides customers with convenient and accessible services, improving overall customer satisfaction and loyalty. Engaged customers tend to use more banking services, leading to increased revenue streams for the bank.

A positive correlation coefficient was observed between ATM machines and financial performance of commercial banks demonstrated by a correlation factor of 0.357 and this relationship was deemed statistically significant, with a p-value of 0 that was below 0.05. The findings supported Ezekiel, Ehiedu and Onuorah (2021) findings that ATMs reduce the operational costs associated with traditional brick-and-mortar branches. They operate 24/7 without the need for extensive staff, significantly reducing overhead costs related to staffing, utilities, and maintaining physical branches. Tadesse and Bakala (2021) also indicated that providing access to ATMs enhances customer retention by offering convenience and accessibility. Customers tend to stay loyal to banks that offer them easy access to their funds and a network of ATMs, reinforcing their relationship with the bank.

A positive correlation coefficient was found between agency banking and financial performance of commercial banks presenting a correlation factor of 0.373. This relationship was considered statistically significant, evidenced by a p-value of 0, below 0.05. The findings supported Nyota and Muturi (2019) findings that agency banking allows banks to expand their service networks beyond traditional branches by using third-party agents. This enables them to reach customers in remote or underserved areas where establishing physical branches may not be feasible or cost-effective. Consequently, banks can tap into new markets, attracting more customers and increasing their deposit base. Margaret and Ruth (2019) also indicated that the ease of conducting transactions through agents encourages customers to carry out more banking activities, such as deposits, withdrawals, fund transfers, and bill payments. This surge in transaction volumes generates additional fee-based income for banks.

A positive correlation coefficient emerged between internet banking and financial performance of commercial banks as denoted by a correlation factor of 0.416. This relationship was deemed statistically significant, illustrated by a p-value of 0, below 0.05.

The findings supported Simiyu (2018) findings that unlike physical branches that have limited operating hours, internet banking offers round-the-clock access to banking services. This increased convenience encourages customers to remain engaged with the bank and use its services more frequently. Obbo (2022) also indicated that online banking encourages banks to continually improve their digital platforms, introducing new features, functionalities and innovative services.

Finally, a positive correlation coefficient was observed between bank size and financial performance of commercial banks with a correlation factor of 0.526. This relationship was deemed statistically significant, as indicated by a p-value of 0, below 0.05. The findings supported Afrifa, Ggyapong and Zalata (2019) findings that larger banks have more diversified operations including a wider range of products, services and geographic presence. This diversification can help mitigate risks associated with economic fluctuations in specific regions or sectors. Larger banks might have more resources to invest in advanced risk management technologies and processes contributing to better risk mitigation and financial stability (Chodorow-Reich et al., 2022).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this concluding chapter, the study summarizes the findings discussed earlier, aiming to construct a comprehensive conclusion based on these results. Subsequently, it aims to formulate recommendations derived from these findings, intended for utilization by policymakers.

5.2 Summary of Findings

Descriptive results showed that financial performance as measured by ROA in the 5-year period recorded a mean of 0.64% with the highest at 7.4% and the lowest at -3.7%. The average value of mobile banking transactions was Ksh 10, 651 million with the highest at Ksh 95,135.2 million and the lowest at Ksh 41.2 million. The average value of ATM machines transactions was Ksh 29,584.73 million with the highest at Ksh 21,9971 million and the lowest at Ksh 473 million. The average value of agency banking was Ksh 35,232.36 million with the highest at Ksh 420,550.1 million and the lowest at Ksh 0 million. The average value of internet banking was Ksh 704.7826 million with the highest at Ksh 4,357.91 million and the lowest at Ksh 46.72 million. The average value of total assets was Ksh 139,656.5 million with the highest at Ksh 971,353 million and the lowest at Ksh 2,882 million.

A positive significant correlation coefficient emerged between mobile banking and financial performance signified by a correlation factor of 0.174 and the p-value of 0.015. Similarly, a significant positive correlation coefficient was observed between ATM machines and financial performance demonstrated by a correlation factor of 0.357 and the p-value of 0. Conversely, a significant positive correlation coefficient was found between

agency banking and financial performance presenting a correlation factor of 0.373 and the p-value of 0. Likewise, a significant positive correlation coefficient emerged between internet banking and financial performance as denoted by a correlation factor of 0.416 and the p-value of 0. Finally, a significant positive correlation coefficient was observed between bank size and financial performance, with a correlation factor of 0.526 and the p-value of 0.

The R-squared indicated that 37.2% of financial performance in commercial banks were accounted for mobile banking, ATM machines, agency banking, internet banking and bank size. At a 5% significance level, the overall model was deemed significant as the computed F-value (22.358) surpassed the critical F-value (value = 2.262). This indicates a substantial impact of mobile banking, ATM machines, agency banking, internet banking and bank size on financial performance. The obtained p-value was 0, falling below 0.05, signifying a significant relationship between financial innovations and financial performance of commercial banks at the 5% significance level.

It was observed that if all independent variables were maintained at zero, ROA would stand at 14.1%. A unit decrease in mobile banking would result to a 3% decrease in ROA while a unit increase in ATM machines would result to a 0.6% decrease in ROA. A unit increase in agency banking would result to a 0.8% increase in ROA while a unit increase in internet banking would result to a 0.8% increase in ROA. A unit increase in bank size would result to a 5% decrease in ROA. Mobile banking, agency banking and bank size had p values less than 0.05 an indication that the three variables had a significant effect on financial performance. ATM machines and internet banking had p values higher than 0.05 and hence the study didn't reject their specific null hypothesis of an insignificant effect on financial performance.

5.3 Conclusions

Mobile banking had a positive effect on financial performance of commercial banks in Kenya. This is because mobile banking provides customers with convenient and accessible services improving overall customer satisfaction and loyalty and in turn increasing the number of transactions thus increasing revenue and financial performance.

ATM banking had a positive effect on financial performance of commercial banks in Kenya. This is because ATM operate 24/7 without the need for extensive staff, significantly reducing overhead costs related to staffing, utilities and maintaining physical branches thus increasing financial performance.

Agency banking had a positive effect on financial performance of commercial banks in Kenya. This is because agency banking enables banks to reach customers in remote or underserved areas where establishing physical branches may not be feasible or cost-effective. Consequently, banks can tap into new markets, attracting more customers and increasing their deposit base.

Internet banking had a positive effect on financial performance of commercial banks in Kenya. This is because online banking encourages banks to continually improve their digital platforms, introducing new features, functionalities and innovative services.

Bank size had a positive effect on financial performance of commercial banks in Kenya. This is because larger banks might have more resources to invest in advanced risk management technologies and processes contributing to better risk mitigation and financial stability.

5.4 Policy Recommendations

The study recommends that commercial banks in Kenya should collaborate with Fintech companies and technology partners to leverage innovative solutions and stay ahead in providing cutting-edge mobile banking services to their customers so as to enhance their financial performance.

Commercial banks in Kenya should integrate advanced features such as mobile-based authentication for smoother and faster transactions and also consider upgrading to biometric authentication for added security and convenience for their customers.

Commercial banks in Kenya should focus on expanding the network of agents to reach more remote or underserved areas, increasing accessibility for customers and also identify strategic locations based on customer demographics and transaction volumes.

The commercial banks in Kenya should continuously update and innovate the internet banking platform by incorporating new features, services and technologies. They should keep abreast of industry trends and technological advancements to stay competitive.

The commercial banks in Kenya should ensure that they enjoy economies of scale, and this can be achieved through merges and acquisitions as this will enhance synergy and which in turn may reduce operational costs of the banks.

5.5 Limitations of the Study

The study was restricted to only 5 years from year 2018 to 2022, a longer term of the study might have captured periods of different financial significance of commercial banks. This may have likely given a longer time centre thus given a broader measurement to the issues involved.

The study used five variables that is mobile banking, ATM banking, agency banking, internet banking and bank size as the variables affecting financial performance of commercial banks. The study therefore overlooked other variables such as firm size, managerial effectiveness and market risks affecting bank performance.

The study was limited to secondary data collected from the commercial banks in Kenya financial statements. While the data was verifiable since it came from the bank's financial statements, it nonetheless could still be prone to shortcomings.

5.6 Suggestions for Further Study

This study sought to determine the effect of financial innovations on financial performance of commercial banks in Kenya and was confined to mobile banking, ATM banking, agency banking, internet banking and bank size as the variables affecting financial performance of commercial banks. There are still other variables that affect financial performance of commercial banks such as firm size, managerial effectiveness and market risks and hence future studies should consider incorporating them and establishing their effect on financial performance of commercial banks.

The study was restricted to secondary data hence its suggested that other variables from which primary data can be sought be used in determining factors that affect financial performance of commercial banks. This would thus help compare the result findings from the primary data and secondary effect on financial performance of commercial banks.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya

1. KCB Bank Kenya Ltd
2. Equity Bank Kenya Ltd
3. Co-operative Bank of Kenya Ltd
4. NCBA Bank Kenya PLC
5. Absa Bank Kenya Plc
6. Standard Chartered Bank Kenya Ltd
7. I&M Bank Ltd
8. Stanbic Bank Kenya Ltd
9. Citibank N.A. Kenya
10. Bank of Baroda (Kenya) Limited
11. Diamond Trust Bank Kenya Ltd
12. Bank of India
13. Family Bank Ltd
14. Prime Bank Ltd
15. Guaranty Trust Bank
16. National Bank of Kenya Ltd
17. Gulf African Bank Ltd
18. Kingdom Bank Ltd
19. Victoria Commercial Bank Plc
20. Middle East Bank (K) Ltd
21. Sidian Bank Ltd
22. Habib AG Zurich
23. Bank of Africa (K) Ltd
24. Guardian Bank Ltd
25. Paramount Bank Ltd
26. African Banking Corporation Ltd
27. M-Oriental Bank Ltd
28. Eco bank Kenya Ltd
29. HFC Ltd
30. Development Bank of Kenya Ltd
31. SBM Bank Kenya Ltd
32. Credit Bank Plc
33. First Community Bank Ltd
34. Access Bank (Kenya) PLC
35. UBA Kenya Bank Ltd
36. Consolidated Bank of Kenya Ltd
37. Mayfair CIB Bank Ltd
38. DIB Bank Kenya Ltd
39. Spire Bank Limited

Appendix II: Return on Assets

		2018	2019	2020	2021	2022
	BANK	%	%	%	%	%
1.	KCB Bank Kenya Ltd	5	4.9	3.11	4.7	5
2.	Equity Bank Kenya Ltd	5.6	5.1	3.41	4.9	5
3.	Co-operative Bank of Kenya Ltd	4.3	4.5	2.13	3.9	5
4.	NCBA Bank Kenya PLC	4	4.2	3.63	3.1	4
5.	Absa Bank Kenya Plc	3.2	4.7	2.2	3.4	4
6.	Standard Chartered Bank Kenya Ltd	3.3	3.2	2.15	3.6	5
7.	I&M Bank Ltd	3.1	2	1.41	3.4	4
8.	Stanbic Bank Kenya Ltd	3.8	3.2	1.96	3	3
9.	Citibank N.A. Kenya	3.4	2.8	3.48	3.7	7
10.	Bank of Baroda (Kenya) Limited	3.1	5.8	5.15	4.5	4
11.	Diamond Trust Bank Kenya Ltd	6.6	3.8	1.26	1.4	2
12.	Bank of India	4.2	4.5	3.64	4	3
13.	Family Bank Ltd	3.9	2.3	1.59	2.8	3
14.	Prime Bank Ltd	2.1	1.7	1.46	2.3	3
15.	Guaranty Trust Bank	1.4	1.6	0.78	0.9	4
16.	National Bank of Kenya Ltd	0.5	7.4	1.49	2.6	1
17.	Gulf African Bank Ltd	1.7	1.9	1.58	1.7	2
18.	Kingdom Bank Ltd	0.6	1.7	1.27	1.8	2
19.	Victoria Commercial Bank Plc	1.7	1.6	1.66	0.6	1
20.	Middle East Bank (K) Ltd	2.2	1.4	0.25	2.4	4
21.	Sidian Bank Ltd	1.9	1.5	1.09	1.9	1
22.	Habib AG Zurich	1.2	0.3	0.45	1.2	2
23.	Bank of Africa (K) Ltd	0.9	0.6	0.95	1.6	1
24.	Guardian Bank Ltd	0.4	1	0.31	0.7	2
25.	Paramount Bank Ltd	1.1	0.6	0.85	0.3	2
26.	African Banking Corporation Ltd	0.6	0.7	0.45	0.8	1
27.	M-Oriental Bank Ltd	1.5	0.8	0.3	1.2	1
28.	Eco bank Kenya Ltd	0.3	0.2	0.33	1.3	0
29.	HFC Ltd	1	0.5	0.11	0.8	0
30.	Development Bank of Kenya Ltd	0.2	0.7	0.04	0.3	1
31.	SBM Bank Kenya Ltd	0	0	0.01	0.7	0
32.	Credit Bank Plc	-1	-0.6	-0.41	0.6	0
33.	First Community Bank Ltd	-3.9	-4.2	-2.03	0.5	-2
34.	Access Bank (Kenya) PLC	-1.6	-6.6	-2.76	0.4	-2
35.	UBA Kenya Bank Ltd	-3.3	-4.4	-1.51	-10.2	-3
36.	Consolidated Bank of Kenya Ltd	-2.7	-8.8	-5.22	-1.3	-3
37.	Mayfair CIB Bank Ltd	-3.8	-0.7	-1.77	-4.4	-4
38.	DIB Bank Kenya Ltd	-0.7	-13.3	-24.59	-2	-3
39.	Spire Bank Limited	-2.2	-6.7	-19.81	-30.2	-37

Appendix III: Volume of Mobile Banking Transactions

	Bank	2018	2019	2020	2021	2022
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Ltd	51,744.90	61,486.90	66,712.10	78,696.30	95,135.20
2.	Equity Bank Kenya Ltd	46,738.60	55,192.70	61,413.60	71,696.60	81,176.80
3.	Co-operative Bank of Kenya Ltd	38,850.40	45,877.70	51,048.60	59,596.20	67,476.40
4.	NCBA Bank Kenya PLC	12,906.60	15,145.60	23,528.90	37,468.60	41,100.70
5.	Absa Bank Kenya Plc	11309.6	13355.3	14860.6	17348.8	19,642.80
6.	Standard Chartered Bank Kenya Ltd	17672.1	20868.7	23220.8	27108.9	30,693.40
7.	I&M Bank Ltd	19,093.30	22,546.80	25,088.10	29,288.90	33,161.60
8.	Stanbic Bank Kenya Ltd	16,385.20	19,349.00	21,529.80	25,134.80	28,458.20
9.	Citibank N.A. Kenya	526.9	622.2	692.4	808.3	915.20
10.	Bank of Baroda (Kenya) Limited	7138.1	8429.2	9379.3	10,949.70	12,397.60
11.	Diamond Trust Bank Kenya Ltd	4560	5384.8	5991.7	6995	7,919.90
12.	Bank of India	3778.8	4462.3	4965.3	5796.7	6,563.10
13.	Family Bank Ltd	13,237.90	15,632.30	17,394.30	20,306.70	22,991.80
14.	Prime Bank Ltd	2792.8	3298	3669.7	4284.1	4,850.60
15.	Guaranty Trust Bank	340.4	402	447.3	522.2	591.30
16.	National Bank of Kenya Ltd	6695.9	7907.1	8798.3	6341.2	11,629.60
17.	Gulf African Bank Ltd	358.8	423.7	471.5	550.4	623.20
18.	Kingdom Bank Ltd	2489.1	2939.3	3270.6	3818.2	4,323.10
19.	Victoria Commercial Bank Plc	2612	3084.4	3432.1	4006.7	4,536.50
20.	Middle East Bank (K) Ltd	57.9	68.4	76.1	88.8	100.60
21.	Sidian Bank Ltd	894.2	1055.9	1175	1371.7	1,553.10
22.	Habib AG Zurich	577.8	682.3	759.2	886.3	1,003.50
23.	Bank of Africa (K) Ltd	7395.2	8732.8	9717.1	11,344.10	12,844.10
24.	Guardian Bank Ltd	322.1	380.3	423.2	494.1	559.40
25.	Paramount Bank Ltd	418.1	493.8	549.4	641.4	726.20
26.	African Banking Corporation Ltd	286.8	338.6	376.8	439.9	498.10
27.	M-Oriental Bank Ltd	163.9	193.5	215.3	251.4	284.60
28.	Eco bank Kenya Ltd	48	56.7	63.1	41.2	83.40
29.	HFC Ltd	555.2	655.6	729.5	851.6	964.20
30.	Development Bank of Kenya Ltd	3189.7	3766.7	4191.3	4893	5,540.00
31.	SBM Bank Kenya Ltd	510	602.2	670.1	782.3	885.70
32.	Credit Bank Plc	252.9	298.6	332.3	387.9	439.20
33.	First Community Bank Ltd	3130.4	3696.6	4113.3	4802	5,437.00
34.	Access Bank (Kenya) PLC	3749.1	4427.3	4926.3	5751.2	6,511.60
35.	UBA Kenya Bank Ltd	1432.4	1691.5	1882.2	2197.3	2,487.90
36.	Consolidated Bank of Kenya Ltd	14,746.60	17,413.90	19,376.70	22,621.10	25,612.20
37.	Mayfair CIB Bank Ltd	419.6	495.4	551.3	643.6	728.70
38.	DIB Bank Kenya Ltd	1185.2	1399.6	1557.3	1818.1	2,058.50
39.	Spire Bank Limited	2246.1	2586.7	2826.4	3087.2	3,624.60

Appendix IV: Volume of Automated Teller Machine Transactions

	Bank	2018	2019	2020	2021	2022
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Ltd	37,405	136,304	219,971	193,254	201,583
2.	Equity Bank Kenya Ltd	30,051	115,789	142,160	134,436	165,066
3.	Co-operative Bank of Kenya Ltd	38,157	105,158	163,087	148,162	151,197
4.	NCBA Bank Kenya PLC	18,504	57,237	94,609	113,560	126,076
5.	Absa Bank Kenya Plc	30,511	86,052	119,247	94,593	113,661
6.	Standard Chartered Bank Kenya Ltd	18,533	80,804	114,331	96,819	96,228
7.	I&M Bank Ltd	19,056	61,761	85,025	76,058	86,863
8.	Stanbic Bank Kenya Ltd	14,458	41,543	6,214	71,774	71,306
9.	Citibank N.A. Kenya	23,731	52,305	82,127	43,817	75,186
10.	Bank of Baroda (Kenya) Limited	8,361	27,524	11,475	38,872	37,329
11.	Diamond Trust Bank Kenya Ltd	23,128	62,879	98,950	93,388	82,301
12.	Bank of India	7,640	27,165	10,413	25,245	21,573
13.	Family Bank Ltd	7,434	31,844	21,231	27,460	7,457
14.	Prime Bank Ltd	8,344	23,771	6,888	31,137	38,170
15.	Guaranty Trust Bank	1,640	9,419	8,053	18,695	12,472
16.	National Bank of Kenya Ltd	7,413	20,289	13,743	15,305	24,504
17.	Gulf African Bank Ltd	4,453	12,204	7,113	9,596	9,457
18.	Kingdom Bank Ltd	473	3,268	3,811	7,501	2,517
19.	Victoria Commercial Bank Plc	16,584	22,067	7,537	12,187	20,126
20.	Middle East Bank (K) Ltd	1,404	4,240	5,820	2,523	3,750
21.	Sidian Bank Ltd	801	3,375	3,238	7,486	2,676
22.	Habib AG Zurich	4,639	16,934	6,453	6,172	26,766
23.	Bank of Africa (K) Ltd	8,397	4,684	7,885	18,389	4,804
24.	Guardian Bank Ltd	2,328	9,125	8,357	5,158	7,780
25.	Paramount Bank Ltd	2,894	5,299	5,630	3,822	9,283
26.	African Banking Corporation Ltd	1,275	6,596	6,016	6,862	5,975
27.	M-Oriental Bank Ltd	1,967	5,311	5,421	6,576	7,177
28.	Eco bank Kenya Ltd	6,041	2,638	6,266	13,983	2,015
29.	HFC Ltd	2,133	16,880	6,426	21,636	8,565
30.	Development Bank of Kenya Ltd	2,288	4,934	6,681	6,363	3,130
31.	SBM Bank Kenya Ltd	1,771	3,690	11,999	3,490	6,719
32.	Credit Bank Plc	2,036	6,062	8,140	5,787	4,857
33.	First Community Bank Ltd	2,666	8,120	6,665	3,711	9,131
34.	Access Bank (Kenya) PLC	2,264	5,811	4,672	7,418	8,625
35.	UBA Kenya Bank Ltd	1,382	4,509	10,508	4,695	2,929
36.	Consolidated Bank of Kenya Ltd	10,602	37,536	20,525	24,035	8,291
37.	Mayfair CIB Bank Ltd	2,062	3,955	7,961	2,539	5,908
38.	DIB Bank Kenya Ltd	1,197	3,030	9,751	2,756	1,924
39.	Spire Bank Limited	2,229	4,820	4,465	4,630	5,708

Appendix V: Volume of Agency Banking Transactions

	Bank	2018	2019	2020	2021	2022
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Ltd	194,453.79	201,041.38	176,317.64	271,317.79	300,621.75
2.	Equity Bank Kenya Ltd	288,085.09	297,844.66	261,216.21	356,156.27	420,550.05
3.	Co-operative Bank of Kenya Ltd	146,015.12	150,961.73	132,396.71	203,732.21	225,736.52
4.	NCBA Bank Kenya PLC	114,455.08	118,332.52	103,780.18	159,697.07	176,945.32
5.	Absa Bank Kenya Plc	73,606.80	76,100.41	66,741.71	102,702.22	113,794.67
6.	Standard Chartered Bank Kenya Ltd	56,927.92	58,856.49	51,618.42	79,430.48	88,009.45
7.	I&M Bank Ltd	56,328.68	58,236.95	51,075.06	78,594.37	87,083.03
8.	Stanbic Bank Kenya Ltd	53,032.85	54,829.47	48,086.63	73,995.76	81,987.75
9.	Citibank N.A. Kenya	0.00	0.00	0.00	0.00	0.00
10.	Bank of Baroda (Kenya) Limited	17,477.87	18,069.98	15,847.76	24,386.55	27,020.45
11.	Diamond Trust Bank Kenya Ltd	34,256.63	35,417.15	31,061.61	47,797.64	52,960.07
12.	Bank of India	23,070.79	23,852.37	20,919.04	32,190.25	35,666.99
13.	Family Bank Ltd	56,029.06	57,927.18	50,803.39	78,176.31	86,619.83
14.	Prime Bank Ltd	15,380.53	15,901.58	13,946.03	21,460.16	23,777.99
15.	Guaranty Trust Bank	0.00	0.00	0.00	0.00	0.00
16.	National Bank of Kenya Ltd	14,881.16	15,385.29	13,493.23	20,763.41	23,005.98
17.	Gulf African Bank Ltd	0.00	0.00	0.00	0.00	0.00
18.	Kingdom Bank Ltd	2,696.59	2,787.94	2,445.08	3,762.50	4,168.87
19.	Victoria Commercial Bank Plc	0.00	0.00	0.00	0.00	0.00
20.	Middle East Bank (K) Ltd	0.00	0.00	0.00	0.00	0.00
21.	Sidian Bank Ltd	0.00	0.00	0.00	0.00	0.00
22.	Habib AG Zurich	0.00	0.00	0.00	0.00	0.00
23.	Bank of Africa (K) Ltd	2,297.09	2,374.91	2,082.85	3,205.09	3,551.26
24.	Guardian Bank Ltd	0.00	0.00	0.00	0.00	0.00
25.	Paramount Bank Ltd	0.00	0.00	0.00	0.00	0.00
26.	African Banking Corporation Ltd	15,680.15	16,211.35	14,217.70	21,878.22	24,241.20
27.	M-Oriental Bank Ltd	0.00	0.00	0.00	0.00	0.00
28.	Eco bank Kenya Ltd	0.00	0.00	0.00	0.00	0.00
29.	HFC Ltd	4,694.06	4,853.08	4,256.26	6,549.53	7,256.92
30.	Development Bank of Kenya Ltd	2,596.71	2,684.68	2,354.52	3,623.14	4,014.47
31.	SBM Bank Kenya Ltd	0.00	0.00	0.00	0.00	0.00
32.	Credit Bank Plc	1,797.72	1,858.63	1,630.06	2,508.33	2,779.25
33.	First Community Bank Ltd	1,597.98	1,652.11	1,448.94	2,229.63	2,470.44
34.	Access Bank (Kenya) PLC	0.00	0.00	0.00	0.00	0.00
35.	UBA Kenya Bank Ltd	0.00	0.00	0.00	0.00	0.00
36.	Consolidated Bank of Kenya Ltd	4,694.06	4,853.08	4,256.26	6,549.53	7,256.92
37.	Mayfair CIB Bank Ltd	0.00	0.00	0.00	0.00	0.00
38.	DIB Bank Kenya Ltd	0.00	0.00	0.00	0.00	0.00
39.	Spire Bank Limited	0.00	0.00	0.00	0.00	0.00

Appendix VI: Total Assets

		2018	2019	2020	2021	2022
	BANK	Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Ltd	621,722.88	674,301.72	758,345.00	877,415.00	971,353.00
2.	Equity Bank Kenya Ltd	438,508.78	507,525.24	496,823.00	826,395.00	894,012.00
3.	Co-operative Bank of Kenya Ltd	408,303.62	449,616.47	667,650.00	540,387.00	562,082.00
4.	NCBA Bank Kenya PLC	284,691.00	302,295.90	283,569.00	546,734.00	619,662.00
5.	Absa Bank Kenya Plc	325,362.74	254,252.17	377,936.00	428,746.00	477,291.00
6.	Standard Chartered Bank Kenya Ltd	281,515.70	374,109.20	325,873.00	335,111.00	381,631.00
7.	I&M Bank Ltd	280,953.01	464,890.69	491,614.00	307,802.00	315,510.00
8.	Stanbic Bank Kenya Ltd	229,161.13	287,250.60	318,986.00	319,199.00	390,320.00
9.	Citibank N.A. Kenya	232,317.12	292,705.14	166,313.00	180,381.00	139,827.00
10.	Bank of Baroda (Kenya) Limited	195,054.63	96,570.19	106,454.00	130,940.00	193,775.00
11.	Diamond Trust Bank Kenya Ltd	85,638.69	143,311.34	312,189.00	326,377.00	359,270.00
12.	Bank of India	123,014.40	62,543.24	75,129.00	86,867.00	121,649.00
13.	Family Bank Ltd	62,689.13	108,785.53	116,204.00	111,683.00	128,465.00
14.	Prime Bank Ltd	98,534.46	78,857.13	90,591.00	126,482.00	140,403.00
15.	Guaranty Trust Bank	70,647.74	72,519.36	79,190.00	146,543.00	32,973.00
16.	National Bank of Kenya Ltd	115,143.44	15,358.07	37,653.00	34,301.00	142,769.00
17.	Gulf African Bank Ltd	32,336.96	36,072.41	31,267.00	41,410.00	38,162.00
18.	Kingdom Bank Ltd	66,909.84	29,082.40	37,890.00	37,678.00	34,660.00
19.	Victoria Commercial Bank Plc	21,520.67	24,823.46	27,212.00	103,388.00	52,082.00
20.	Middle East Bank (K) Ltd	16,185.96	21,540.74	126,842.00	24,701.00	12,962.00
21.	Sidian Bank Ltd	17,805.42	16,386.45	21,947.00	28,554.00	42,586.00
22.	Habib AG Zurich	25,323.37	75,377.85	32,643.00	43,471.00	30,856.00
23.	Bank of Africa (K) Ltd	33,325.58	35,122.98	11,022.00	31,691.00	48,849.00
24.	Guardian Bank Ltd	49,080.86	18,762.84	33,500.00	43,350.00	15,658.00
25.	Paramount Bank Ltd	15,323.11	28,680.49	11,378.00	81,958.00	13,813.00
26.	African Banking Corporation Ltd	27,212.71	16,088.32	16,858.00	25,893.00	36,966.00
27.	M-Oriental Bank Ltd	9,887.41	10,443.30	18,743.00	12,448.00	13,334.00
28.	Eco bank Kenya Ltd	54,463.88	26,451.64	12,985.00	11,186.00	101,225.00
29.	HFC Ltd	10,515.02	12,393.78	17,222.00	17,736.00	55,168.00
30.	Development Bank of Kenya Ltd	15,332.12	8,466.28	23,145.00	36,341.00	16,892.00
31.	SBM Bank Kenya Ltd	5,360.86	57,083.28	94,428.00	13,211.00	81,758.00
32.	Credit Bank Plc	10,235.52	9,317.70	30,612.00	13,461.00	25,722.00
33.	First Community Bank Ltd	6,856.57	8,652.48	12,886.00	13,657.00	17,641.00
34.	Access Bank (Kenya) PLC	17,880.46	6,860.30	12,729.00	17,289.00	14,602.00
35.	UBA Kenya Bank Ltd	9,223.08	11,865.61	44,917.00	14,283.00	16,290.00
36.	Consolidated Bank of Kenya Ltd	12,887.33	8,987.92	13,263.00	52,098.00	15,553.00
37.	Mayfair CIB Bank Ltd	10,004.86	112,028.75	54,478.00	15,523.00	12,929.00
38.	DIB Bank Kenya Ltd	57,083.28	8,584.54	5,114.00	3,855.00	18,236.00
39.	Spire Bank Limited	25,329.17	43,996.12	10,147.00	13,598.00	2,882.00

Appendix VII: Volume of Internet Banking Transactions

	Bank	2018	2019	2020	2021	2022
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Ltd	2,094.71	1,962.30	2,637.05	3,181.45	4,357.91
2.	Equity Bank Kenya Ltd	2,922.32	3,119.82	3,233.05	2,978.01	3,267.12
3.	Co-operative Bank of Kenya Ltd	2,675.90	2,892.93	3,038.65	2,798.94	3,070.70
4.	NCBA Bank Kenya PLC	1,254.88	1,464.52	2,552.53	2,630.06	2,768.91
5.	Absa Bank Kenya Plc	1,529.58	2,024.35	2,147.92	1,978.48	2,170.57
6.	Standard Chartered Bank Kenya Ltd	1,604.01	1,744.45	1,595.94	1,470.04	1,612.77
7.	I&M Bank Ltd	1,296.88	1,513.52	1,641.61	1,512.11	1,658.92
8.	Stanbic Bank Kenya Ltd	848.87	990.67	1,140.82	1,050.83	1,152.85
9.	Citibank N.A. Kenya	1,215.49	1,418.54	1,527.34	1,406.85	1,543.42
10.	Bank of Baroda (Kenya) Limited	675.61	788.48	664.81	612.38	671.83
11.	Diamond Trust Bank Kenya Ltd	1,432.28	1,671.54	2,157.37	1,987.18	2,180.11
12.	Bank of India	636.56	742.90	775.04	713.89	783.20
13.	Family Bank Ltd	49.77	58.09	78.86	72.63	79.70
14.	Prime Bank Ltd	830.66	566.00	587.39	541.05	593.59
15.	Guaranty Trust Bank	184.87	215.75	235.69	217.09	238.19
16.	National Bank of Kenya Ltd	375.98	438.79	485.90	447.57	491.02
17.	Gulf African Bank Ltd	209.45	244.44	208.38	191.95	210.58
18.	Kingdom Bank Ltd	65.05	75.92	85.08	78.37	85.98
19.	Victoria Commercial Bank Plc	478.67	558.63	657.36	605.50	664.29
20.	Middle East Bank (K) Ltd	109.41	127.69	130.45	120.16	131.82
21.	Sidian Bank Ltd	75.58	88.20	90.29	83.17	91.24
22.	Habib AG Zurich	360.12	420.28	404.04	372.17	408.29
23.	Bank of Africa (K) Ltd	116.97	136.51	175.36	161.52	177.20
24.	Guardian Bank Ltd	181.07	211.32	226.40	208.53	228.78
25.	Paramount Bank Ltd	125.48	146.43	108.30	99.76	109.44
26.	African Banking Corporation Ltd	152.93	178.49	183.94	169.43	185.89
27.	M-Oriental Bank Ltd	121.19	141.44	193.59	178.33	195.63
28.	Eco bank Kenya Ltd	46.72	54.52	62.31	57.39	62.96
29.	HFC Ltd	322.60	376.50	411.16	378.71	415.49
30.	Development Bank of Kenya Ltd	213.47	256.82	326.81	374.46	402.77
31.	SBM Bank Kenya Ltd	86.10	100.48	98.63	90.84	99.67
32.	Credit Bank Plc	149.47	174.44	215.30	198.31	217.58
33.	First Community Bank Ltd	155.19	181.11	187.88	173.07	189.86
34.	Access Bank (Kenya) PLC	134.39	156.84	167.37	154.17	169.12
35.	UBA Kenya Bank Ltd	115.67	135.00	172.48	158.87	174.30
36.	Consolidated Bank of Kenya Ltd	85.53	99.81	110.73	101.99	111.90
37.	Mayfair CIB Bank Ltd	105.98	123.68	156.35	144.00	158.00
38.	DIB Bank Kenya Ltd	62.10	72.48	57.68	53.14	58.30
39.	Spire Bank Limited	118.34	138.11	180.37	166.15	182.28

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