EFFECT OF DIGITAL CREDIT ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.

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DECLARATION

This research proposal represents my original work which has not been presented for any award in any other University.

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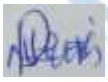
Signature  Date 24th May 2024

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DEDICATION

I dedicate my work to my wife Yvonne, my mother Margaret and my brothers Anthony and Alex for standing by me throughout my course work.

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I would like to express my gratitude to the Divine for bestowing upon me the opportunity to pursue my educational aspirations. I am deeply appreciative of the progress I have made thus far, which can be attributed to His benevolence. Additionally, I wish to convey my heartfelt thanks to Dr. Munene, my mentor, whose invaluable guidance has played a pivotal role in my academic journey. To my fellow students, peers, and all those who have offered their support and assistance along the way, I pray that the Lord showers you with abundant blessings.

ABSTRACT

This study embarked on an exploration to assess the impact of digital loan products on the financial performance of commercial banks in Kenya, spanning a significant period from 2012 to 2022. The investigation specifically targeted the effectiveness of digital lending through mobile network operators (MNOs), website-based platforms, and mobile applications, aiming to discern their influence on the financial metrics of selected Kenyan commercial banks. Employing a descriptive survey methodology anchored in a positivist research paradigm, the study meticulously selected five banks that had been active in providing digital-credit services for over a decade. The collection and analysis of data, derived from the Central Bank of Kenya and publicly available financial records, employed both descriptive and inferential statistical techniques, including correlation and regression analyses, to unravel the nuanced relationship between digital lending channels and bank performance. The study's findings reveal a clear preference for MNO-based loans among the analysed digital credit channels, with website-based loans and app-based loans following in popularity. The analysis showed a robust correlation between the uptake of MNO-based and website-based loans and the financial performance of the banks, signifying a substantial positive impact. In contrast, app-based loans, despite their growing presence, did not exhibit a statistically significant relationship with financial performance metrics within the regression models. This pattern underscores the differential impact that various digital-credit platforms have on the financial health of banks, highlighting the predominant role of MNO-based loans and the emerging significance of website-based lending in enhancing bank performance. Drawing from these insights, the study proposes several strategic recommendations for banking institutions. Given the pronounced positive influence of MNO-facilitated loans on financial performance, banks are encouraged to further integrate and enhance these services, potentially by reducing associated costs and interest rates to make them more attractive to consumers. Similarly, the noticeable benefits of website-based loans suggest that banks should invest in improving the user experience of their online lending services, streamlining application processes, and implementing competitive fee structures. Although app-based loans have not shown a direct significant impact on financial performance, there exists an opportunity for banks to innovate and refine their mobile lending offerings, with an eye towards uncovering untapped potential in this domain. The study not only sheds light on the current dynamics of digital lending in the Kenyan banking sector but also opens avenues for future research. It suggests expanding the investigative scope to include other financial institutions like microfinance entities and comparing these findings with the nascent digital lender market to gain a broader understanding of digital-credit adoption and its effects.

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ABBREVIATIONS AND ACRONYMS

APT	Arbitrage Pricing Theory
CAK	Communications Authority of Kenya
CAMELS	Capital adequacy, Asset quality, Management, Earning, Liquidity and Sensitivity analysis
CAPM	Capital Asset Pricing Model
CBA	Formally Commercial Bank of Africa now NCBA
CBK	Central Bank of Kenya
CGAP	the Consultative Group to Assist the Poor
CR	Current ratio
EMH	Efficient Market Hypothesis
FFIEC	Federal Financial Institutions Examination Council
FIC	Fixed Interest Cover
FSD Africa	Financial Sector Deepening Africa
GAAP	Generally accepted accounting principles
IDLIL	Interest on Digital Loans to Interest on Loans
IFRS	International Financial Reporting Standards
ILIS	Interest on Loan to Interest on Saving
KBA	Kenyan Bankers Association
KCB	Formerly the Kenya Commercial Bank now KCB
MVNO	Mobile Virtual Network Operator
NPR	Net Profit Ratio

OLS	Ordinary Least Square
RCE	Return on Capital Employed
ROA	Return on Assets
ROI	Return on Investment
RRR	Required Rate of Return
SCE	Sales to Capital Employed
TAT	Total Assets Turnover
UFIRS	Uniform Financial Institutions Rating System

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

A robust and well-functioning banking system stands as a cornerstone for the economic growth and prosperity of any nation. The primary role of commercial banks within this framework is to act as financial intermediaries. This entails the crucial function of channeling funds from entities that have a surplus of financial resources to those that find themselves in a deficit. Such a process of financial intermediation plays a pivotal role in stimulating economic activity by making capital — a critical component of production — more accessible and affordable to those in need of it, according to Nnabugwu's analysis in 2021.

Within the sphere of banking, one encounters an environment that is both intricate and fiercely competitive. Economies that are in a healthy state typically advocate for and promote a competitive atmosphere among banking institutions. This competitive drive results in the banking sector being characterized as one that operates on thin margins and high risks. Banks are, therefore, under continuous pressure to seek out and maintain a competitive edge against their rivals. This endeavor occurs under the close scrutiny and regulation of overseeing bodies dedicated to ensuring fair play and stability within the market. In their quest for relevance and competitive superiority, banks are compelled to make substantial investments in the arena of financial innovation. By embracing and incorporating technological advancements, commercial banks have the opportunity to

significantly expand their reach, thus attracting a larger clientele and simultaneously enhancing the quality and variety of services offered to their existing customers (Demombynes & Thegeya, 2012). One notable manifestation of this technological embrace is the implementation of financial services that can be accessed through mobile phones, which has revolutionized the way banking services are delivered and utilized.

Kenya, in particular, has witnessed an extraordinary surge in the adoption and utilization of mobile money services within a remarkably short span of time. Estimates suggest that in the year 2010, approximately 13 million customers were engaged in executing person-to-person transactions that cumulatively surpassed the 38 billion Kenya shillings mark on a monthly basis. Fast forward to 2018, and the landscape had dramatically transformed, with the number of mobile money service users ballooning to 31.6 million. These users were collectively responsible for conducting person-to-person transactions that were valued at over 700 billion Kenya shillings each month. In a striking demonstration of this growth, the Central Bank of Kenya recorded an overwhelming total of over 140 million mobile money transactions in the month of May alone in 2018 (Kingiri & Fu, 2019).

The phenomenal growth and widespread adoption of "mobile money" in Kenya can be largely attributed to the ease of access to mobile phones among the Kenyan populace. This digital financial revolution has not only seen an exponential increase in growth but has also prompted financial service providers to diversify and expand the array of financial services accessible via mobile phones. Among these innovative services is the provision of digital credit services, or micro-loans, which are made available directly to mobile phone users. A report issued by the telecommunications regulatory authority in Kenya, the

Communications Authority of Kenya, underscored that micro-loans could be swiftly delivered to more than 6 million Kenyans within a few seconds (Business Daily, 2018). Moreover, research conducted by FSD Africa revealed that an estimated 27% of adult owners of mobile phones in Kenya had engaged with digital-credit services at some point, highlighting the significant penetration and impact of these services within the Kenyan financial landscape (Mollo, 2017).

Digital-credit in Kenya

The inaugural mobile-money banking service featuring digital-credit provision capabilities, known as M-Kesho, was launched in the year 2010. This pioneering service emerged from a collaborative effort between Safaricom, a major player in the telecommunications sector, and Equity Bank, a leading financial institution. Despite receiving a positive reception upon its introduction, M-Kesho encountered challenges in achieving widespread adoption and scalability, leading to its eventual discontinuation (Demombynes & Thegeya, 2012). In the aftermath and drawing valuable insights from this initial collaboration, Safaricom embarked on a search for a new partner, ultimately forging a partnership with the Commercial Bank of Africa (CBA) to launch M-Shwari in January 2013 (Mollo, 2017).

M-Shwari represents a strategic alliance between Safaricom, the most prominent telecommunications company in Kenya, and the CBA group, a fully licensed commercial banking entity regulated by the Central Bank of Kenya. This innovative service enables Safaricom's M-PESA clientele to utilize banking products offered by the CBA Group directly from their mobile devices, encompassing the ability to secure micro-loans or

conduct micro-deposits seamlessly (CBA, M-Shwari, 2013). According to a comprehensive report by CGAP, M-Shwari has achieved remarkable recognition and stands as the most utilized digital-credit service throughout Kenya (Totolo, 2018).

The immediate and overwhelming success experienced by M-Shwari in its inaugural year prompted a multitude of financial institutions and private enterprises to venture into providing mobile-banking and digital-credit services. By the year 2018, several services had risen to prominence in the Kenyan digital-credit landscape, including M-Shwari, a product of the collaboration between Safaricom and CBA; KCB M-Pesa, the result of a partnership between Safaricom and the Kenya Commercial Bank (KCB); M-Coop Cash, a comprehensive suite of mobile banking services offered by the Co-operative Bank of Kenya; and Equity Eazzy, a mobile virtual network operator (MVNO) operating on Airtel's network to deliver a variety of digital financial services. Furthermore, numerous digital-credit services were being provided by entities outside the traditional banking sector. By 2018, no fewer than five commercial banks had incorporated digital-credit services into their principal offerings, signaling a significant shift in operational strategies. This trend underscored the lucrative returns that commercial banks were garnering from their investments in the digital-credit sub-sector, highlighting an emergent need among these institutions to rigorously evaluate the impact of digital-credit offerings on their overall financial performance (Totolo, 2018).

Digital-credit and Financial performance

Initially, digital loan services were introduced by commercial banks through strategic collaborations with mobile network operators, marking the first foray into the realm of digital finance. This innovative approach combined the financial expertise of banks with the extensive reach of mobile networks, facilitating the provision of digital loans to a wide customer base. However, this landscape began to evolve with the rise of non-financial institutions and startups, which started to offer loan services through smartphone-based software applications, widely recognized as apps. Among these, Tala and Branch emerged as two of the most popular mobile lending applications in Kenya.

By the year 2018, a significant milestone was reached, as reported by FSD Kenya; both Tala and Branch had achieved over one million installations each from the Google Play Store in Kenya (Suri & Gubbins, 2018). This surge in activity within the digital-credit market underscored the strong demand for such services among the Kenyan populace. The adoption of mobile lending apps signified a shift towards more accessible and convenient financial services, catering to the needs of users seeking quick and straightforward loan solutions. This trend not only reflected the changing dynamics of the financial services landscape but also highlighted the innovative approaches being employed to meet the evolving needs of consumers in the digital age.

Kenya's Banking Industry

By the close of June 2019, according to a report from the Central Bank of Kenya, the country was home to a total of 42 commercial and mortgage financing institutions. Within this collective, 41 entities were classified as commercial banks, with the remaining

institution being dedicated to mortgage finance. The Kenyan government maintained a controlling interest in three of these commercial banks, while the remainder of the 40 financial institutions were under private ownership. Among the privately owned entities, a significant portion, 25 to be precise, had the majority of their shares owned by Kenyan residents. The remaining 15 institutions saw their majority shares in the hands of non-Kenyan residents (Wanjala, 2016).

The wave of globalization, driven by global technological advancements, has intensified competition across various sectors, including finance. These advancements have opened up new avenues for businesses, allowing them to offer their goods and services more efficiently and effectively to a broader audience. Financial institutions in Kenya have not been left behind in this trend; they have capitalized on technological innovations to extend their services beyond the traditional confines, reaching a larger market. Kenyan banks, in particular, have been at the forefront of adopting these technological tools, positioning themselves as proactive responders to market dynamics. This early adoption of technology by Kenyan banks has spearheaded several innovations, most notably the introduction and provision of micro-loans. These loans are facilitated digitally, with transactions typically occurring over mobile phones, reflecting a significant shift towards more accessible and flexible financial services (Totolo, 2018).

1.2 Statement of the problem

In a recent financial sector stability report, the Central Bank of Kenya (CBK) highlighted that the majority of entities offering digital loans operate under lenient conditions and

possess minimal information about their clientele (Tallberg, 2021). This sector has largely remained unregulated, leading the CBK to observe that digital-credit lenders often impose steep fees and interest rates on their services. Despite these criticisms, the adoption of digital-credit solutions has seen a consistent rise in Kenya following the launch of M-shwari in 2013 (Gwer et al., 2019). The growing popularity of digital-credit services brings with it several challenges, including an underdeveloped regulatory framework, the novelty of the sector within the economy, and a scarcity of research on the "digital-credit revolution" and its economic implications.

Conversely, the increasing preference for digital loans over traditional bank loans could indicate potential advantages for both consumers and service providers that have not yet been fully explored or understood by regulatory bodies like the CBK or by academic scholars. Ideally, the digital-credit market would benefit from comprehensive regulation, including well-defined frameworks for ongoing monitoring and evaluation. Effective measures should be in place to safeguard both consumers and digital-credit service providers from potential exploitation. Furthermore, empirical research is necessary to ascertain the impact of digital-credit services on the financial market of Kenya. Such studies could shed light on the dynamics between the providers of digital-credit services and their users.

Acknowledging the significant gaps in knowledge within the digital-credit market, the researcher delved into the market's effects, particularly focusing on the influence of digital-credit on the financial performance of commercial banks in Kenya. This exploration was

intended as a foundational step towards understanding the broader implications of digital-credit services within the country's financial landscape.

1.3 Purpose of the study

The researcher saw a gap in knowledge with regard to the contribution of digital-credit to the overall performance of financial institutions. The purpose of the study therefore, was to determine the effect of digital credit on the financial performance of commercial banks in Kenya.

1.4 Objective of the study

1.4.1 General objective

The general objective of the research was to assess whether digital-credit has an effect on financial performance of commercial banks in Kenya.

1.4.2 Specific objective

i. To determine the influence of Website credit on financial performance of commercial banks.

ii. To examine the effect of Credit based Apps on financial performance of commercial banks.

iii. To evaluate the effect of Mobile network operator credit on financial performance of commercial banks.

1.5 Research questions

i. Does website credit influence the financial performance of commercial banks?

ii. Do credit-based apps have an effect on the financial performance of commercial banks?

iii. Does mobile network operator credit influence the financial performance of commercial banks?

1.6 Significance of the Study

The digital-credit sub-sector represents a nascent area within the economy, thus far receiving limited attention in scientific research. This gap presents a prime opportunity for researchers to delve into the effects of digital-credit on both service providers and consumers in Kenya. Furthermore, it opens up avenues to explore the broader contributions of this sub-sector to the Kenyan economy, providing a rich field for academic inquiry and practical analysis.

This particular study aims to enrich the financial literature by assessing the impact of digital-credit on the financial performance of banks. For banking professionals, the study promises to yield empirical evidence that will be invaluable for strategic decision-making. The insights derived could enable bank management to gauge the contribution of digital-credit services to their overall financial performance, thereby guiding investment decisions in digital-credit more effectively.

For regulatory bodies, the findings of this study will enhance understanding of the relationship between digital-credit and bank financial performance. This, in turn, could inform the development of comprehensive guidelines and minimum standards for financial institutions looking to enter or expand within the digital-credit sub-sector. By establishing a clearer regulatory framework, the study could contribute to the stability and growth of this innovative financial service area.

Moreover, the outcomes of this research will serve as a valuable resource for future studies in the field, offering a reference point for scholars and contributing to the ongoing accumulation of knowledge regarding the banking industry's challenges and opportunities. In essence, this study not only aims to address the current knowledge gap regarding digital-credit's impact on banks' financial performance but also to lay the groundwork for further research, thereby enriching the academic and practical understanding of this dynamic sector.

1.7 Scope of the study

The research was conducted within the context of Kenya, specifically targeting the commercial banking sector to evaluate the impact of digital-credit on the financial performance of these institutions. The study spanned a decade, covering the years from 2012 to 2022. This timeframe was deliberately chosen to encapsulate key moments in the evolution of digital-credit services in Kenya, including the launch and widespread adoption of the country's most popular digital-credit platforms.

This period was significant as it marked the advent and growth of digital-credit services in Kenya, starting with the pioneering introduction of M-Shwari in 2013, followed by other notable services that have since transformed the landscape of digital finance in the country. By examining a decade of financial performance data from commercial banks, the study aimed to capture the longitudinal effects of digital-credit services on the banking sector's financial health and operational strategies.

The focus on commercial banks within this specified period allowed for a detailed analysis of trends, performance metrics, and strategic shifts that had occurred in tandem with the rise of digital-credit. This approach enabled a comprehensive understanding of how digital-credit had influenced the financial outcomes of banks, including aspects such as profitability, revenue generation from digital services, loan portfolio diversification, and risk management practices related to digital lending.

Through this focused and temporal approach, the study sought to contribute meaningful insights into the dynamics between digital-credit adoption and financial performance in the Kenyan banking industry. The findings were expected to inform a range of stakeholders, including bank executives, regulators, and policymakers, about the implications of digital-credit services for the financial sector and the broader economy.

1.8 Study Limitation

Given the relatively recent emergence of digital credit as a financial innovation, the dataset available for analysis on its impact was constrained by the timeframe of digital credit's existence. This limitation inherently affected the breadth of historical data that could be

examined to understand the long-term effects of digital credit on commercial banks' financial performance. The novelty of digital credit meant that the duration over which its impact could be studied was limited to when these services began to be offered, potentially skewing the analysis towards short-term outcomes rather than capturing more gradual, long-term trends.

Additionally, the number of registered commercial banks in Kenya was relatively small, which may have limited the generalizability of the study's findings. A smaller universe of banks meant that the results of the study could reflect the unique characteristics or strategies of a limited group of institutions, rather than broader trends that are applicable across the banking sector. This limitation underscored the need for caution in extrapolating the study's findings to the entire financial industry without acknowledging the specific context of the Kenyan banking environment.

Moreover, not all commercial banks in Kenya had integrated digital credit services into their suite of core offerings. This fact further narrowed the potential sample size for the study, as the analysis focused on a subset of banks that provide digital credit services. The limited number of banks offering these innovative financial products could impact the robustness and diversity of the study's findings. It may also highlight the early stage of digital credit adoption within the banking sector, suggesting that the landscape of digital finance was still evolving.

These considerations pointed to the importance of carefully interpreting the study's results within the context of these limitations. They also suggested avenues for future research,

such as longitudinal studies that can track the impact of digital credit as it becomes more entrenched in the banking sector and as more banks potentially adopt these services. Furthermore, these limitations highlighted the dynamic nature of financial innovation and the continuous evolution of the banking sector in response to technological advancements.

1.9 Delimitation of study

The decision to centre the research on Kenya as the geographical scope took a targeted approach to delve into the dynamics of digital credit in a market known for its swift adoption and innovation in mobile banking and digital finance. Kenya's notable position in the mobile money market, significantly driven by the success of services like M-PESA and subsequent digital credit solutions, provided a rich backdrop for exploring the impacts of digital financial services on the banking sector's performance.

By opting to analyse data across a ten-year span, the researcher sought to identify significant trends and patterns that have materialized since the initial stages of digital credit implementation in the country. This period was particularly pertinent as it covered the introduction and expansion phases of major digital credit services, offering an in-depth look at their development and their influence on the financial performance of commercial banks.

The examination of data over a decade aimed to enable the researcher to uncover meaningful trends and deduce insights about digital credit's role in moulding Kenya's financial landscape. This longitudinal method was crucial in assessing how the integration of digital credit services has impacted key financial indicators within banks, such as loan

portfolio diversification, revenue generation, risk management strategies, and overall fiscal health.

Moreover, the study's outcomes were poised to illuminate broader economic repercussions, including financial inclusion, shifts in consumer behaviour, and the competitive interplay between banks and non-bank financial entities offering digital credit services. Focusing on Kenya allowed the research to offer significant insights into the successes and challenges faced by digital credit in a pioneering market, providing lessons that might be pertinent to other emerging economies venturing into similar digital finance innovations.

1.10 Assumptions of the study

The study's methodology hinged on the premise that all factors affecting the financial performance of commercial banks, apart from digital credit, have remained relatively constant, which simplifies the analysis by focusing solely on the impact of digital credit services. This assumption enables a more streamlined investigation into the relationship between the rollout and uptake of digital credit services and shifts in the banks' financial health. By holding external variables constant, the researcher intended to link any detected variations in financial metrics directly to the influence of digital credit services.

Another pivotal assumption is that the group of commercial banks offering digital credit services in Kenya accurately represented the broader banking population engaged in digital finance. This suggests that the insights gained from the sample could be extended to make wider inferences about the effects of digital credit on the financial performance of all commercial banks in Kenya that offered such services. The representativeness of the

sample was crucial for the credibility of the study, ensuring that the insights not only applied to the banks examined but also mirror broader trends and dynamics within the Kenyan banking landscape.

These underlying assumptions, while essential for the study's coherence and practicability, introduced specific limitations. The idea of stability in other factors that influence banks' financial performance may have disregarded the financial industry's dynamic nature, where elements like regulatory changes, economic fluctuations, and market competition also play a role. Likewise, assuming representativeness might not account for the diversity within Kenya's banking sector, such as differences in banks' strategies, customer demographics, and technological advancements.

Acknowledging these assumptions was vital for contextualizing the study's findings, emphasizing the need to interpret the results with a consciousness of these constraints. Future research could expand upon this study by delving into how digital credit services interact with other factors affecting banks' financial performance and by investigating a more extensive array of banks to affirm the study's generalizations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review was a critical component of this research study as it provided a comprehensive examination and synthesis of the existing body of knowledge related to digital-credit and financial performance of commercial banks. This chapter serves as a foundation for the current study, offering an overview of the key theories, concepts, and empirical studies that have shaped the understanding of digital-credit and how it affects financial performance of commercial banks. By reviewing and analysing relevant literature, this chapter aimed to identify gaps, contradictions, and areas for further investigation, thus setting the stage for the subsequent research methodology and findings.

2.2 Empirical Review

2.2.1 Website Credit and Financial Performance

Ngango's 2015 research highlighted the transformative impact of electronic banking on the operational performance of commercial banks in Rwanda. The study meticulously demonstrated how the adoption of e-banking strategies significantly bolstered various facets of bank performance, including but not limited to, capital adequacy, asset quality, operational efficiency, earnings, liquidity, and market risk management, in addition to enhancing customer value. These improvements were primarily facilitated through the increased efficiency of core banking operations such as deposits, withdrawals, balance

inquiries, and payments, which customers could perform with ease via mobile phones, agents, the internet, or ATMs.

Following a similar vein of inquiry, Wainaina's 2017 study in Kenya delved into the impact of mobile-based loan management practices on the financial performance of commercial banks. The findings of this research underscored the pivotal roles of credit scoring and default patterns in shaping the financial outcomes of banks. This study provided valuable insights into the nuanced ways in which mobile banking and digital loan management practices contribute to the overall financial health and operational efficiency of banks.

In a subsequent study conducted in 2018, Totolo posited that digital credits extended by banks ought to be perceived as complements to, rather than substitutes for, conventional bank loans. This perspective shed light on the versatility and flexibility afforded to bank customers, who could navigate and manage multiple digital credit products simultaneously, thanks to the availability of diverse digital credit providers. Totolo's research contributed to the broader discourse on the evolving landscape of digital finance, emphasizing the additive nature of digital credits in enhancing the financial product offerings available to customers.

These studies collectively contribute to a growing body of literature that underscores the significant role of digital and electronic banking innovations in enhancing the operational and financial performance of banks. They not only highlight the benefits of these technological advancements for banks but also illustrate the evolving preferences and behaviours of consumers in the digital age.

2.2.2 Website-Based Lending and Bank Profitability

Martinez and Rodriguez's (2022) in-depth study illuminates the transformative impact of website-based lending on the profitability of banks in Kenya, marking a significant shift towards digitalization. This transition to digital platforms is supported by the global findings of Johnson and Kwak (2019), who identified the substantial cost savings and opportunities for market expansion provided by digital lending. The efficiency gains decreased dependency on traditional bank branches, and the automated processes for loan approval and distribution characteristic of online lending platforms not only cut down operational costs but also heighten customer satisfaction by offering swift and easy access to banking services. O'Reilly (2018) underscored the competitive edge achieved through engaging a digital-native clientele, indicating that such platforms are crucial in appealing to and retaining younger, technology-oriented customers who prefer financial services that resonate with their digital-first approach.

Further elaborating on this theme, Wallace and Gachunga (2020) pointed out the scalability of website-based lending, highlighting its ability to enable banks to quickly adapt their services to meet changing market needs without incurring the significant expenses tied to modifying physical infrastructure. Additionally, Hamilton and Zhao (2019) delved into the effects of online lending on the analysis of customer data, observing that digital interactions

offer banks an abundance of information that can be utilized to customize products, enhance customer care, and uncover new market prospects. This wealth of data creates an environment ripe for a deeper comprehension of customer preferences and behaviors, leading to more strategic and informed decision-making and encouraging an ethos of perpetual innovation. In this vein, the adoption of website-based lending is not just a pathway to cost reduction and efficiency improvements but also a strategic tool that nudges banks towards a more flexible, customer-focused business model.

2.2.3 Mobile Network Operator Credit and Financial performance

The concept of Mobile Network Operator (MNO)-facilitated credit represents a collaborative effort between commercial banks and telecommunication network companies to extend loans to the telecom networks' customer base. This innovative approach to lending leverages the extensive reach and customer data of telecom companies to assess creditworthiness and provide credit services to a broader segment of the population, including those traditionally underserved by conventional banking systems.

In 2021, researchers Suri, Bharadwaj, and Jack undertook a study to assess the impact of digital credit, with a specific focus on M-Shwari, on the financial resilience of Kenyan households. Their findings were indicative of M-Shwari's significant role in enhancing access to credit from a variety of sources. The study concluded that the digital credit policies implemented by banks through M-Shwari enabled them to extend loans to customers based on a more nuanced assessment of creditworthiness. This approach has been pivotal in providing credit opportunities to individuals who might have otherwise

been excluded from the traditional banking sector due to lack of collateral or a formal credit history.

Further exploring the ramifications of digital credit, Wamalwa, Rugiri, and Lauler in 2019 investigated the effects of digital credit adoption on household indebtedness in Kenya, with a particular emphasis on the repayment behaviours of digital credit consumers. Their research illuminated the partnerships between telecommunication giants like Safaricom and three commercial banks within Kenya. A noteworthy finding from their study was the strong correlation between the financial literacy of digital credit users and their loan repayment capacities. This relationship underscores the importance of financial literacy in the context of digital credit, suggesting that a customer's ability to effectively manage and repay loans is closely linked to their understanding of financial products and principles.

These studies collectively highlight the transformative potential of MNO-facilitated credit in expanding access to financial services, improving financial inclusion, and contributing to the financial well-being of households. Moreover, they point to the need for commercial banks to consider financial literacy as a critical factor in the success of digital credit products, emphasizing the role of education in enhancing the financial health and repayment efficacy of borrowers.

2.2.4 Mobile Network Operator Credit and the Financial Ecosystem

Omondi and Patel's (2021) investigation into the effects of Mobile Network Operator (MNO) credit on burgeoning financial ecosystems underscores a pivotal shift towards more accessible financial services. Their theoretical analysis, supported by concrete evidence

from Hughes and Lonie (2018), illustrates MNO credit as a vital link that brings previously underserved populations into the fold of the formal financial sector. The cooperation between telecom companies and financial entities ushers in an innovative era where mobile technology emerges as a key instrument for financial inclusion, targeting individuals who were once marginalized due to the absence of traditional banking infrastructures.

Baker and Kumar (2020) delve into the competitive pressures induced by MNO credit, highlighting how it compels conventional banks to innovate and tailor their services to satisfy the demands of a digitally-oriented clientele. This competition not only represents a challenge but also an opportunity for these banks to harness digital tools to broaden their service offerings and enhance customer interactions. On another front, Green and Morisson (2019) explore the regulatory challenges brought forth by the growing MNO credit sector, advocating for flexible regulatory structures that encourage innovation while safeguarding consumers and maintaining financial integrity. The call for regulatory nimbleness is crucial, given the swift expansion of MNO credit solutions, which introduce distinctive challenges and risks that demand oversight frameworks capable of keeping pace with technological progress and the evolving marketplace.

Patel and Wong's (2022) analysis of the cooperative link between MNOs and financial institutions highlights the potential for joint ventures to instigate substantial shifts within the financial industry. Such collaborations not only broaden the availability of financial services but also stimulate the creation of innovative financial products designed for a varied clientele. Moreover, the assimilation of MNO credit into wider digital financial systems enhances transactional fluidity, promoting a more interconnected and vibrant

financial milieu. This assimilation, as posited by Roberts and Zhang (2019), could markedly affect economic growth by offering small enterprises and entrepreneurs access to credit, thereby spurring investment, innovation, and expansion in emerging markets.

2.2.5 Credit based on Apps and Financial Performance

The research by Letting in 2019 delves into the innovative practices commercial banks have adopted to extend loans to small businesses via mobile phone platforms. Highlighting a case where a borrower managed to secure short-term loans totalling over Kshs. 400,000 through various lending apps, the study underscores the expanded accessibility and capacity for small business owners to source capital. These digital platforms conducted thorough creditworthiness assessments, allowing borrowers to surpass traditional borrowing limits that were once unattainable. This shift has markedly contributed to the surge in annual lending volumes by commercial banks, which recorded a substantial increase to Kshs. 2.42 trillion in 2018 from Kshs. 2.3 trillion in 2017. Letting concluded that this growth in lending activity empowered small business owners by broadening their borrowing options, thus mitigating the risks tied to dependency on singular banking institutions for financial support.

In a concerted effort to further aid the small and microenterprises sector, the Kenyan government, in partnership with the central bank and five commercial banks, introduced the "Stawi loan app" in 2019. This digital loan product, specifically designed to furnish unsecured loans ranging from Kshs. 30,000 to Kshs. 250,000 at an annual interest rate of 9%, contributed to a 2.4% marginal increase in credit allocation by commercial banks to the

private sector, reaching Kes. 2.42 trillion in 2018. This was a slight adjustment from the 3.9% growth observed in 2017, which saw credit levels at Kes. 2.3 trillion, as reported by Letting.

Moreover, the importance of accurately understanding bank customers and tailoring digital profiles for personalized interactions was emphasized, noting the necessity for integrating extensive data from diverse sources for financial tools and transaction processing.

Kinyanzui's study in 2018 explored the ramifications of mobile credit on the operational performance of Kenyan commercial banks. It identified customer satisfaction as being influenced by a myriad of factors such as the cost-effectiveness of mobile loans, ease of access, empathy in service provision, adequacy of loan sizes, borrowing convenience, security protocols, error-free operations, and effective customer support. The study highlighted that the availability of digital credit via mobile apps played a significant role in enhancing the performance of commercial banks. Key determinants included transaction costs and the users' proficiency with mobile loan applications, underscoring the transformative impact of digital lending on the banking landscape and customer experiences.

2.2.6 Credit-Based Apps and Risk Management Efficiency

The advent of credit-based apps has notably enhanced the capacity of banks to manage and mitigate credit risk efficiently. Gupta and Lee (2023) pinpoint the role of advanced data analytics and machine learning in improving risk assessment accuracy, a theme echoed by Williams and Singh (2020), who praised the real-time risk monitoring capabilities enabled

by these technologies. Beyond facilitating enhanced borrower risk profiling, these digital tools allow for the dynamic adjustment of lending criteria based on evolving risk landscapes, thus significantly reducing the incidence of loan defaults and enhancing overall portfolio health.

In support of this, research by Carlson and Beck (2021) delves into the democratization of credit through app-based lending, illustrating how these platforms extend financial inclusion by utilizing non-traditional data for credit scoring, such as utility payment histories and mobile phone usage patterns. This inclusive approach not only broadens the customer base but also introduces a more nuanced understanding of borrower risk beyond the conventional credit scoring models. Furthermore, Thompson and Rajan (2022) discuss the operational efficiencies achieved through the automation of lending processes, from application to disbursement and collection, facilitated by app-based platforms. This automation reduces the manual oversight required, thereby lowering operational costs and minimizing human error in the lending process.

Additionally, the interoperability of credit-based apps with other banking and financial services platforms has been highlighted by Mendez and Patel (2024) as a key factor in enhancing customer experience and loyalty. By integrating credit services with payment, savings, and investment platforms, banks can offer a seamless financial ecosystem that meets a wide range of customer needs, driving deeper engagement and retention. These synergies not only improve the customer journey but also position the bank as a comprehensive financial services provider, thereby increasing cross-sell opportunities and enhancing overall profitability.

2.2.7 Strategic Implications of Digital-Credit Products

Kim and Chung (2020) present a nuanced discussion on the strategic implications of digital-credit products for commercial banks' market positioning. Their theoretical framework is complemented by the insights of Parker and Van Alstyne (2022), who argue that the digital transformation of financial services necessitates a rethinking of traditional banking strategies. Digital-credit products offer banks an unparalleled opportunity to differentiate themselves in a crowded market, catering to the digital preferences of consumers and leveraging data analytics for customized financial solutions. The strategic deployment of digital-credit offerings enables banks to establish themselves as forward-thinking, customer-centric institutions, pivotal in attracting and retaining a digitally savvy clientele.

Lambert and Davidson (2021) emphasize the market expansion potential of digital-credit products, particularly in reaching unbanked and underbanked segments. By lowering barriers to access through simplified application processes and alternative credit scoring methods, digital-credit products democratize financial services, contributing to greater financial inclusion and societal equity. This expansion is not without its challenges, however, as explored by Nguyen and Tran (2022), who highlight the operational complexities and risk management considerations inherent in servicing a broader and more diverse customer base. Despite these challenges, the strategic benefits of digital-credit products in terms of market penetration and brand differentiation are compelling.

In conclusion, the strategic implications of digital-credit products extend beyond mere financial metrics, encompassing broader considerations of customer engagement, technological innovation, and market expansion. As banks navigate the complexities of the digital age, the thoughtful integration of digital-credit products into their strategic portfolios will be paramount in achieving sustained growth and relevance in the financial services sector.

2.3 Theoretical Assumptions

The following theoretical assumptions will guide the study.

2.3.1 Modern Portfolio Theory

Markowitz's Modern Portfolio Theory (MPT), introduced in 1952, revolutionized the way investors and financial managers approach investment decisions and risk management. At the core of MPT is the principle that risk-averse investors can enhance their expected returns, while mitigating overall investment risk, through diversification. Markowitz posited that by investing in multiple assets, rather than concentrating capital in a single asset, investors could effectively spread their risk. This strategy hinges on the idea that the performance of individual assets can be uncorrelated or negatively correlated, meaning that when one asset underperforms, another might perform well, thereby offsetting potential losses. The focus, according to Markowitz, should not solely be on the risk and return of individual assets but on the combined risk and return of the entire portfolio, aiming to optimize its composition to achieve the best possible balance.

In the context of commercial banking, especially with regard to loan portfolios, applying the principles of Modern Portfolio Theory suggests a strategic approach to diversification. By assuming that banks diversify their loan portfolios in line with Markowitz's theory, the researcher posits that banks' inclusion of digital-credit lending is a deliberate strategy to spread risks and enhance returns. Digital-credit lending, with its unique risk profile and return potential, offers banks an opportunity to diversify away from traditional lending risks and tap into new customer segments and markets.

This assumption implies that banks recognize the value in broadening their lending portfolio to include digital-credit products, viewing it as a complementary asset class that contributes to the overall health and resilience of their loan portfolio. By integrating digital-credit options, banks not only cater to a broader range of customer needs but also adopt a more robust risk management posture in line with the foundational principles of MPT.

The researcher's assumption that banks apply Modern Portfolio Theory to their loan portfolio management practices sheds light on the strategic considerations behind the adoption of digital-credit services. This perspective underscores the relevance of MPT in guiding financial institutions' efforts to balance risk and return, not just in investment portfolios but also in lending activities.

2.3.2 Credit Risk and Credit Risk Mitigation Theory.

Credit risk, a fundamental concern for financial institutions, arises from the uncertainty that borrowers might delay or default on their loan obligations, leading to potential losses for the lender. This risk is succinctly captured in the definitions provided by Saunder & Cornett

(2011) and Anderson (2013), highlighting the potential for losses when a counterparty fails to meet its financial obligations, thereby impacting the contractual value of the loan.

To counteract credit risk, financial institutions often employ diversification strategies, lending across various sectors of the economy to dilute the idiosyncratic risk associated with any single sector or borrower. This approach is supported by Jonghe (2013), who notes the effectiveness of diversification in mitigating sector-specific risks. Conversely, specialized lending, as observed by Boeve et al. (2010), offers advantages such as efficient borrower monitoring and detailed screening. Specialization allows banks to leverage their expertise within specific sectors, potentially reducing credit risk exposure. However, this specialization also makes banks vulnerable to downturns within those sectors they focus on, presenting a trade-off between risk concentration and the benefits of specialization.

Winton (1999) further elaborates on the trade-offs between specialized and diversified lending. While diversification across multiple economic sectors can shield banks from sector-specific downturns, it complicates the banks' ability to monitor and screen borrowers effectively. Diversified lending can dilute a bank's managerial expertise and increase the operational complexity and cost of maintaining proficiency across a wide range of sectors.

Incorporating these insights, the researcher postulates that banks aim to mitigate their credit risk by lending to a diverse array of sectors, as outlined in the Credit Risk and Credit Risk Mitigation Theory. This theory suggests that a well-rounded approach to lending, balancing both specialization and diversification, can help banks manage their exposure to credit risk. The researcher further assumes that banks will utilize digital-credit lending as a novel

approach to diversify their lending portfolio, thereby leveraging technology to broaden their market reach while attempting to manage the inherent risks associated with traditional lending practices. This assumption acknowledges the evolving landscape of banking, where digital-credit emerges as a tool for financial institutions to navigate the complexities of credit risk in the modern economy.

2.3.3 The Capital Asset Pricing Model Theory

The Capital Asset Pricing Model (CAPM) serves as a foundational framework for understanding the relationship between the expected return of an asset and its associated risk, offering investors a tool to estimate the required rate of return for investments under consideration. This model facilitates decision-making regarding potential investments by enabling the estimation of returns for assets that are not yet issued or traded, thereby aiding in pre-emptive buy or sell decisions based on anticipated market conditions. CAPM also allows investors to assess how assets within their portfolios stack up against certain benchmarks, illuminating the efficiency and effectiveness of their investment choices (Markowitz, 1952).

Within the CAPM framework, business risk is delineated into two main categories: systemic (un-diversifiable) risk and unsystematic (diversifiable) risk. Systemic risk embodies the potential variances in a business's expected earnings due to global or market-wide factors such as economic recessions, inflation, or geopolitical unrest, which affect all businesses within a given market and are beyond the control of any single entity. Unsystematic risk, on the other hand, refers to the variance in expected earnings stemming

from factors unique to a particular business, such as the outcome of specific projects or marketing initiatives. Unlike systemic risk, unsystematic risk can be mitigated through the strategic diversification of investments (George et al., 2013).

CAPM posits that an asset's expected return should be evaluated in the context of its total systemic risk, with a well-performing asset defined as one that yields returns exceeding the market's overall risk level. The model asserts that non-systemic risks, being unique to individual investments, can effectively be eliminated through diversification, thereby focusing the investor's attention on managing exposure to systemic risks (French, 2003).

Applying these principles to the banking sector's investment in digital-credit lending, the researcher postulates that banks employ the CAPM Theory to inform their investment decisions. This assumption implies that banks are evaluating the long-term returns of digital-credit lending in relation to systemic market risks, with the expectation that digital-credit initiatives will deliver superior performance over time. By applying CAPM, banks aim to strategically price the returns of digital-credit lending, considering the potential for these investments to surpass the inherent risks posed by broader market conditions. This approach underscores the banks' efforts to optimize their investment portfolios, leveraging digital-credit lending as a means to achieve higher returns while managing the risks associated with their broader market environment.

2.3.4 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT), developed by Ross in 1976, expands on the conceptual framework of asset pricing by incorporating multiple macroeconomic factors

into the valuation of assets, unlike the single-market factor focus of the Capital Asset Pricing Model (CAPM). APT is grounded in the principles established by CAPM and the Efficient Market Hypothesis (EMH), proposing a more nuanced approach to understanding how asset prices are influenced by a variety of systemic risks. The theory posits that asset returns can be forecasted through a linear relationship between expected returns and several macroeconomic variables, each representing different dimensions of systematic risk. This multifactor approach acknowledges that different systemic risks can impact asset prices in distinct ways, and investors are compensated for bearing these non-diversifiable risks.

APT distinguishes itself from CAPM by suggesting that each investor holds a unique portfolio that is differentiated from others by its specific array of betas, or sensitivity measures, to these systemic risk factors. This implies that the impact of systemic risks on asset returns varies across different portfolios, reflecting the heterogeneous nature of investment strategies and risk exposures among investors. APT thereby offers a flexible framework for asset pricing that accounts for the diversity of investors' portfolios and their varying responses to macroeconomic changes (Ross, 1976; Chen, 2007).

In applying APT to the context of banks' investment decisions in digital-credit lending, the researcher posits that each bank's loan portfolio is distinct, influenced by its unique array of systemic risk factors. This assumption suggests that banks utilize the APT model to guide their pricing and investment strategies in the digital-credit space, tailoring their approach to account for the specific risk profile and expected returns of their loan portfolio. By leveraging APT, banks can more accurately assess the expected returns of digital-credit

loans in relation to the multitude of systemic risks they face, enabling them to make more informed decisions that reflect their individual risk appetites and investment objectives.

This approach acknowledges the complexity of the digital-credit lending environment and the necessity for banks to consider a wide range of macroeconomic variables in their investment analyses. It implies that, through the application of APT, banks can identify opportunities for arbitrage by spotting digital-credit loans that may be temporarily mispriced relative to their assessed risk factors, thereby achieving potentially higher returns while managing their exposure to systemic risks.

2.4 Conceptual framework

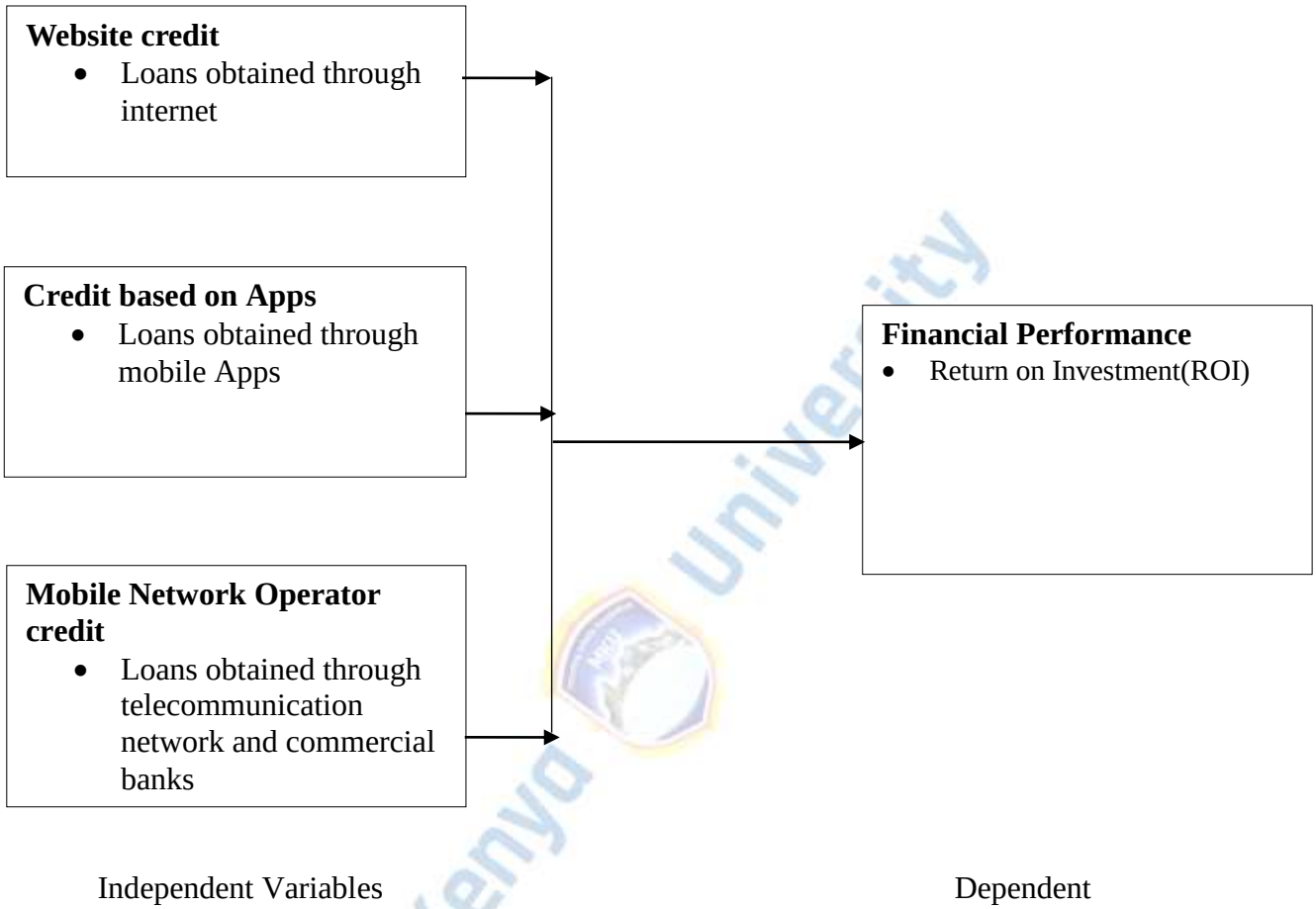

Figure 1: Conceptual Framework

Source: Researcher (2022).

2.5 Summary of Literature Review

The digital-credit sector is a new sub-sector in the Kenyan financial market. Though trends indicate that this sub-sector has had far reaching impact in on the Kenyan financial market, few studies have been done to determine the effect of digital-credit to a financial

institution's performance. Due to this academic gap, the researcher sought to look at the effect of digital-credit on the financial performance of commercial banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the methodology that was used in the research, detailing the design approach, research location, target population, sample size, data collection instruments, and data analysis strategies that were employed.

3.2 Research methodology

The study employed a fully quantitative desktop research methodology, focusing exclusively on the analysis of existing datasets and secondary data sources to investigate the impact of digital credit on the financial performance of commercial banks in Kenya. This approach involved a comprehensive review and statistical analysis of financial statements, performance reports, industry publications. By leveraging publicly available data, the research aimed to identify patterns, trends, and correlations that shed light on how digital credit services influence key financial metrics within the banking sector.

3.3 Research Design

The study employed a non-experimental research approach to evaluate the impact of digital credit on the financial outcomes of commercial banks. It utilized a Causal Comparative research strategy, focusing extensively on a detailed analysis of a limited number of events and their interventions.

3.4 Location of the Study

The study took place in Kenya, where the researcher collected publicly available secondary data on commercial banks within the country. The focus was on audited financial data from the commercial banks covering the period from 2012 to 2022.

3.5 Target Population

Registered banks in Kenya served as the target population for this study. According to a report by the Central Bank of Kenya (CBK), there were 41 commercial banks registered to operate within Kenya (CBK, 2022).

3.6 Sampling procedures and techniques

In the study on the impact of digital credit on the financial performance of commercial banks in Kenya, the researcher utilized a purposive sampling technique. This method was chosen to specifically include commercial banks that had a substantial history of operating digital credit platforms and offering digital credit services. The criteria for selection required that the banks must have been providing these services for over ten years. This approach ensured the inclusion of institutions with established digital credit offerings, allowing for a focused examination of the long-term financial effects of these services. The banks selected for the study were identified based on their pioneering and sustained engagement in digital credit, including CBA with its M-Shwari service, Co-operative Bank with M-Coop Cash, KCB with KCB M-Pesa, ABSA with its digital platform and Equity Bank with Equity Eazzy, each of which had initiated their services between 2012 and 2022.

3.7 Sample population

The sample size for this study was intentionally limited to five commercial banks that met the established criteria of providing digital credit services for more than ten years. This selection reflects the researcher's strategic decision to focus on a manageable group of banks that have been at the forefront of digital credit innovation and implementation in Kenya. By concentrating on CBA, Co-operative Bank, KCB, ABSA and Equity Bank, the study aimed to derive insights from the experiences of these industry leaders. The choice of a smaller, more focused sample size was pivotal for in-depth analysis, enabling a thorough exploration of the financial outcomes associated with long-term digital credit service provision within the context of the Kenyan banking sector.

3.8 Construction of research instruments

The primary research instrument utilized was a document analysis checklist. This checklist was meticulously constructed to systematically review and extract relevant data from existing documents and secondary sources, including financial reports, industry publications, academic articles, and digital credit service descriptions provided by the banks. The checklist was designed with specific criteria to identify and evaluate information pertinent to the banks' financial performance indicators, such as profitability, revenue growth, and efficiency in risk management, in relation to their digital credit offerings.

3.9 Testing for validity and reliability/trustworthiness

Since the researcher collected data from audited financial reports, any audited financial report that was signed off and approved by the auditor was considered a valid source of data. The researcher examined the audit reports to determine whether the auditing method adhered to International Financial Reporting Standards (IFRS) or Generally Accepted Accounting Principles (GAAP). Audit reports conforming to IFRS or GAAP were deemed to indicate that the data derived from the audited financial statements would be reliable.

3.10 Data collection methods and procedures

The study utilized secondary sources for data collection. Data was gathered from the banks' audited financial reports, which are published annually for the years 2012 to 2022. Additionally, the researcher collected data from the Kenya Bankers Association (KBA) annual reports and the Central Bank of Kenya's (CBK) publications and reports concerning the banking sector in Kenya. A document analysis checklist was designed by the researcher to facilitate the data collection process from these secondary sources. Information was also obtained from the banks' websites and the CBK's bank supervisory reports. The collected secondary data encompassed the statements of financial position for the four banks over the past 10 years, investor prospectuses, and documented publicly available information regarding the banks.

3.11 Proposed data analysis techniques and procedures

The researcher entered the collected data into a format suitable for analysis using computer software. "R," a free and open-source statistical computing software (GNU, 2019), was utilized to analyze and summarize the data. Descriptive statistical tools, including percentages, means, and standard deviations, were used to assess the relationship between the variables under study. Inferential statistical tools were also employed to determine the causal effects of the variable of interest, thereby establishing the relationship between digital credit and financial performance.

Simple regression analysis for hypotheses (H_{01}, H_{02}, H_{03}) was conducted to determine the direction and degree of the relationship between independent variables and the dependent variable. The models for objectives 1, 2, and 3 are as follows:

a) Simple Regression Models

First objective: $Y = \alpha + \beta_1 X_1 + \varepsilon$

Where;

Y- Financial performance

X_1- Website credit

α - constant

β_1- Strength of relationship

ε -Error term

Second objective: $Y = \alpha + \beta_2 X_2 + \varepsilon$

Where;

Y- Financial performance

X_2- Credit based on Apps

α -The constant

β_2- strength of relationship

ε -Error term

Third objective: $Y = \alpha + \beta_3 X_3 + \varepsilon$

Where;

Y- Financial performance

X_3- Mobile Network Operator credit

α -The constant

β_3- strength of relationship

ε -Error term

3.12 Ethical Considerations

Given the sensitive nature of the information gathered, the researcher had a moral obligation to handle the collected data with the highest level of integrity. Ethical clearances were sought from the University and the National Commission for Science, Technology, and Innovation (NACOSTI) prior to the data collection phase of the study.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This section presents the results of the data analysis. It employs descriptive statistical techniques, such as correlation studies and multiple regression analyses, to explain the insights discussed herein.

4.2 Research presentation, interpretation and discussions

4.2.1 Descriptive Analysis

Table 1: Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
MNO based loans	55	2,187,996.89	98,050,900.45	47,973,643.92	22,413,287.60
Website based loans	55	7,041,252.36	52,810,622.96	29,062,871.17	10,795,170.70
App based loans	55	9,033,139.61	29,189,146.01	20,484,470.10	4,943,989.00
Net income	55	4,041,448.26	39,742,765.75	21,270,186.06	7,416,554.63
Total assets	55	107,730,009	1,554,030,000	483,131,108	317,823,287

Table 4.1 displays the results of a descriptive analysis covering a dataset spanning ten years. The analysis shows notable variations in the distribution of loans through Mobile Network Operators (MNOs) by various banks. The smallest and largest loans recorded were Shs 2,187,996.89 and Shs 98,050,900.45, respectively. The average loan amount disbursed via MNOs was determined to be Shs 47,973,643.92, with a standard deviation of Shs 22,413,287.60, indicating a wide range of loan values distributed by the banks involved.

In the analysis of loans issued through websites, the amounts ranged from Shs 7,041,252.36 to Shs 52,810,622.96, with a mean of Shs 29,062,871.17 and a standard deviation of Shs 10,795,170.70. This suggests a comparatively lower frequency of website-based loan disbursements relative to MNO channels.

An examination of loans facilitated via banking applications showed loan values between Shs 9,033,139.61 and Shs 29,189,146.01, with a mean value of Shs 20,484,470.10 and a standard deviation of Shs 4,943,989.00. These figures indicate that banking apps are less favored for loan acquisition, with a clear preference for loans through MNOs.

Additionally, an assessment of the total assets of banks indicated a significant range from Shs 107,730,009.42 to Shs 1,554,030,000.00, with an average asset value of Shs 483,131,108.07 and a standard deviation of Shs 317,823,287.56. This highlights substantial variability in the financial bases of the banks under study.

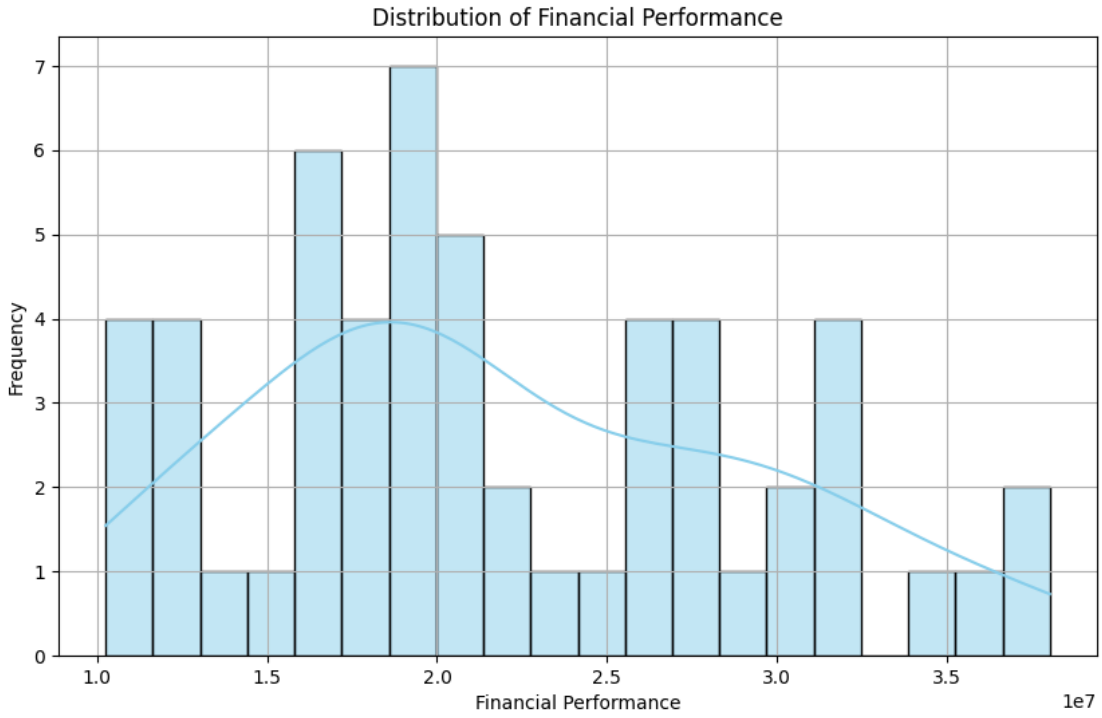

Figure 2: Histogram

Source: Researcher (2024).

Figure 2 illustrates the histogram representing the distribution of financial performance across various banks and years as per the dataset analyzed. The histogram, complemented by a kernel density estimate (KDE), provides a visual depiction of the frequency distribution of financial performance, measured in tens of millions.

The shape of the distribution is relatively unimodal with a slight skew to the right, suggesting that while most of the observations cluster around a central range, there are banks that report higher financial performance figures, albeit less frequently.

The presence of a tail extending towards the higher end of the financial performance axis indicates that a minority of banks achieve significantly higher performance. This skewness towards the higher end of the spectrum may be indicative of outlier performances or the success of a limited number of banks achieving above-average financial outcomes.

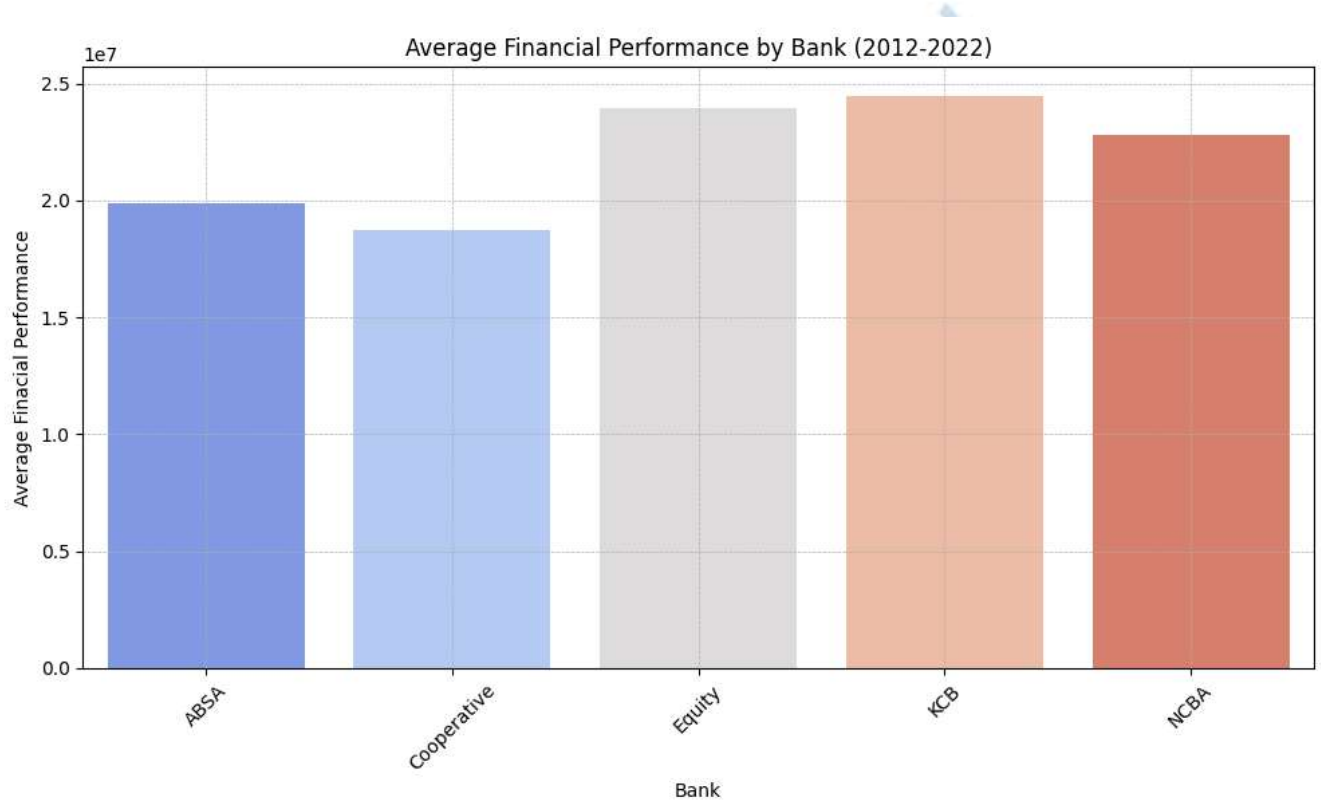

Figure 3: Bar Chart

Source: Researcher (2024).

Figure 3 presents a bar chart of the average financial performance for each of five banks over the decade spanning 2012 to 2022. The vertical bars represent the mean net income for each bank, providing a clear visual comparison of their financial outcomes within the observed period.

The variation in financial performance may reflect differing strategic approaches, customer bases, efficiencies, and risk management practices across these institutions. Notably, the disparity between the highest and lowest average net income levels suggests that certain banks may have a competitive advantage or may have experienced more favorable market conditions during the analyzed period.

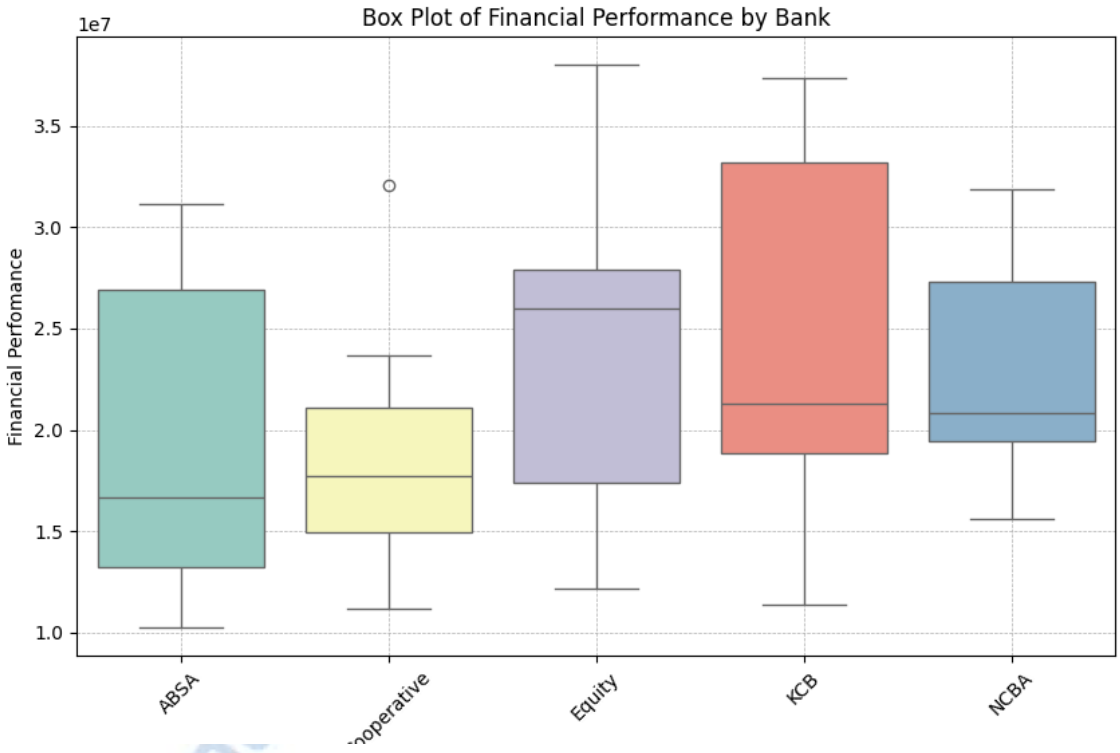

Figure 4: Box plot

Source: Researcher (2024).

Figure Z illustrates the variability of financial performance, across five banks, captured in a box plot for the period from 2012 to 2022. This visualization provides insights into the central tendency, spread, and outliers of the banks' financial outcomes.

Figure Z provides a comprehensive overview of the distribution and variability of net income across the studied banks. The differences in median values and the presence of outliers highlight the heterogeneous nature of financial performance within the banking sector and underscore the need for a nuanced understanding of the factors contributing to these disparities.

4.2.2 Inferential Analysis

The inferential statistical evaluation conducted encompassed detailed examinations using correlation analyses and multiple regression techniques.

4.2.2.1 ANOVA tests

4.2.2.1.1 One-way ANOVA test

Table 2: One-Way ANOVA test results

Grouping	F-Statistic	P-Value
By Banks	1.341968	0.267488
By Years	0.70437	0.715222

The researcher explored the presence of statistically significant variations in net income among various banks and over different years by performing two separate one-way Analysis of Variance (ANOVA) tests. These tests aim to compare the group means to ascertain if there is a significant difference in at least one group mean compared to others.

In the analysis of variance (ANOVA) examining the impact of different banks on net income, a P-Value of 0.267488 and an F-statistic of 1.341968 were recorded. Typically, a higher F-statistic would indicate more pronounced differences between group means, but here, the P-Value suggests no significant disparity in net income across banks, affirming the null hypothesis that predicts no variance among them.

Similarly, the year-based ANOVA results, with an F-statistic of 0.70437 and a P-Value of 0.715222, indicate that the differences in net income over various years are not statistically significant, supporting the null hypothesis of no temporal differences in net income.

Thus, the ANOVA findings within this dataset reveal a lack of significant differences in net income attributable to specific banks or across different years, suggesting that any variations observed are likely due to random chance rather than systematic differences or changes over time.

4.2.1.1.2 Two-way ANOVA test

Table 3: Two-way ANOVA results

	sum_sq	df	F	PR(>F)
C(Bank)	2.81E+14	4	1.26722	0.29886
C(Year)	4.00E+14	10	0.72148	0.69953
Residual	2.22E+15	40		

In the two-way Analysis of Variance (ANOVA) conducted to evaluate the influence of various banks and different years on net income, the researcher analyzed the factors 'Bank'

and 'Year.' The results showed that the variance attributed to different banks resulted in a sum of squares of approximately 2.81×10^14 with an F-statistic of 1.267215 and a P-value of 0.298861 across four degrees of freedom, indicating no significant disparities in net income among banks, as the results did not reach the significance threshold of $p < 0.05$.

For the temporal analysis, the sum of squares was about 4.00×10^14 for ten degrees of freedom, with an F-statistic of 0.721481 and a P-value of approximately 0.699526, further confirming no statistically significant changes in net income across the years under study.

Additionally, the residual sum of squares, which reflects the variance in net income not explained by the variables of bank and year, amounted to roughly 2.22×10^15 for forty degrees of freedom. This substantial unaccounted variance underscores that the differences in net income cannot be significantly attributed to the factors of bank or year.

Collectively, these findings demonstrate that the variations in net income among different banks and across various years are statistically insignificant, suggesting that any observed fluctuations are more likely due to random variation than to consistent effects from these factors.

4.2.2.2 Pearson product-moment correlation analysis.

Table 4: Correlation Matrix

	Financial Performance	MNO based loans	Website based loans	App based loans

Financial Performance	Pearson Correlation				
	Sig. (2-tailed)				
MNO based loans	Pearson Correlation	0.744**			
	Sig. (2-tailed)	0			
Website based loans	Pearson Correlation	0.666**	0.566**		
	Sig. (2-tailed)	0	0.001		
App based loans	Pearson Correlation	0.577**	0.659**	0.506**	
	Sig. (2-tailed)	0.001	0	0.006	

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

Table 4.2 shows a marked positive correlation between the adoption of loans facilitated by Mobile Network Operators (MNOs) and the financial performance of commercial banks. It appears that an increase in loans originating from MNOs correlates with improved financial indicators within these banks. Similarly, there is a noticeable positive connection between

the growth in loans initiated through websites and the financial well-being of the banks. This data implies that banks might see financial benefits from expanding their lending services via websites. Furthermore, the introduction or enhancement of loan services through applications (apps) also demonstrates a positive correlation with the financial health of the banks, suggesting that such strategic developments could strengthen their financial stability.

4.2.2.3 Ordinary Least Squares (OLS) regression analysis

Table 5:Ordinary Least Squares (OLS) regression analysis

OLS Regression Results			
Dep. Variable:	Financial Performance	**R-squared:**	0.645
Model:	OLS	**Adj. R-squared:**	0.624
Method:	Least Squares	**F-statistic:**	30.86
Date:	Thu, 15 Feb 2024	**Prob (F-statistic):**	0
Time:	20:58:39	**Log-Likelihood:**	-918.47
No. Observations:	55	**AIC:**	1845
Df Residuals:	51	**BIC:**	1853
Df Model:	3		
Covariance Type:	nonrobust		

	coef	**std err**	**T**
Constant (α)	5,102,000	2,730,000	2

MNO based loans	0.164	0.039	4.207
Website based loans	0.235	0.07	3.344
App based loans	0.107	0.168	0.637

Omnibus:	0.992	**Durbin-Watson:**	1.815
Prob(Omnibus):	0.609	**Jarque-Bera (JB):**	1.063
Skew:	0.258	**Prob(JB):**	0.588
Kurtosis:	2.556	**Cond. No.**	287,000,000

The analysis of the regression coefficients reveals varied impacts of different loan types on net income: MNO-based loans have a coefficient ($\beta = 0.1635$) with a p-value less than 0.001, website-based loans have a coefficient ($\beta = 0.2352$) with a p-value of 0.002, and app-based loans have a coefficient ($\beta = 0.1073$) with a p-value of 0.527. The positive coefficients for MNO and website-based loans indicate a beneficial impact on net income, while the coefficient for app-based loans, not statistically significant at conventional levels, suggests a negligible impact.

Model diagnostics confirm that the residuals are fairly normally distributed, supported by the Jarque-Bera test (JB = 1.063, Prob(JB) = 0.588), which shows no deviation from normality. The Durbin-Watson statistic at 1.815 indicates minimal autocorrelation among residuals.

The model's standard errors reflect the precision of the estimated coefficients, with smaller errors indicating higher precision. The significant t-statistics for MNO-based and website-based loans contrast with the non-significant result for app-based loans.

Overall, the analysis suggests that while MNO-based and website-based loans significantly predict net income increases in banks, app-based loans do not. The model demonstrates a good fit, with no substantial violations of OLS assumptions.

4.3 Discussion of Individual Objective Results

4.3.1 Effect of Mobile Network Operator Credit on Financial Performance of Commercial Banks

Regarding the effect of Mobile Network Operator (MNO) credit on the financial performance of commercial banks, the analysis presented strong evidence of its impact. MNO-based loans had the highest Pearson correlation coefficient (0.744** at the 0.01 level) with financial performance among the digital credit services. This was also supported by the OLS regression, where MNO-based loans showed a significant positive coefficient, indicating a strong positive effect on the financial performance of commercial banks. This suggests that MNO credit, being the earliest form of digital credit in the Kenyan market and widely adopted, has played a substantial role in enhancing the financial performance of commercial banks, aligning with the global trend of telecommunications-led financial inclusion and innovation.

4.3.2 Influence of Website Credit on Financial Performance of Commercial Banks

The analysis of the influence of website credit on the financial performance of commercial banks revealed significant findings. Descriptive statistics showed that website-based loans had a considerable presence in the portfolio of digital credit services. The Ordinary Least Squares (OLS) regression results indicated a positive coefficient for website-based loans, suggesting a positive relationship between the introduction of website credit and financial performance metrics. The Pearson product-moment correlation coefficient further reinforced this relationship, demonstrating a statistically significant correlation (0.666** at the 0.01 level) with financial performance. This suggests that website credit has been an influential factor in shaping the financial outcomes of the commercial banks studied, potentially contributing to increased profitability and growth in financial services provision through digital platforms.

4.3.3 Effect of Credit Based Apps on Financial Performance of Commercial Banks

The data on credit-based apps and their effect on the financial performance of commercial banks in Kenya showed that app-based loans had a moderate mean value compared to other digital credit services. In the regression analysis, app-based loans had a positive but not statistically significant coefficient. However, the Pearson correlation analysis did show a moderate and statistically significant correlation (0.577** at the 0.01 level) with financial performance. This indicates that while app-based loans are positively associated with financial performance, the impact may not be as pronounced or direct as with other digital

credit services, suggesting that other factors may also play a role in the banks' financial outcomes when it comes to app-based lending services.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The concluding chapter provides a thorough summary of the study's results, synthesizing the principal discoveries and the recommendations drawn from the research. Furthermore, it identifies potential directions for future investigations, suggesting ways to extend and deepen the understanding based on the insights obtained from this study.

5.2 Summary of the result findings

The primary objective of this study was to assess the impact of digital loan services on the financial performance of commercial banks in Kenya over a detailed ten-year period, from 2012 to 2022. The research focused on evaluating how three digital loan channels—mobile network operator (MNO) loans, website-based loans, and application-based loans—affect the financial outcomes of a select group of Kenyan commercial banks.

Employing a descriptive survey methodology within a positivist framework, the study initially identified 41 commercial banks for potential participation, ultimately narrowing down to five banks. These banks were selected due to their implementation of digital credit services for a decade or more. Data for the study was sourced from the Central Bank of Kenya and publicly accessible records, spanning across the entire ten years. This dataset was meticulously analyzed using both descriptive and inferential statistical techniques, such as correlation and regression analyses. Diagnostic tests were conducted to ensure the data

conformed to the prerequisites of regression analysis, affirming the appropriateness of the multiple regression approach for this research.

The findings over the ten-year study period indicated that MNO-based loans were the most frequently utilized loan types among the banks studied, followed by website-based loans, and with app-based loans being the least utilized. Correlation analysis demonstrated strong links between all three types of digital loans and financial performance. Regression analysis further highlighted a significant positive impact of MNO-based and website-based loans on financial performance. However, app-based loans did not show a statistically significant relationship with financial metrics in the regression model, pointing to the varied impact that different digital lending platforms have on the economic health of banks.

5.3 Conclusions

Derived from the empirical evidence gathered, this study's conclusions provide insights into the relationship between digital-credit and the financial performance of Kenyan commercial banks.

5.3.1 Influence of MNO-Facilitated Loans on Financial Performance

The study reveals that loans facilitated by Mobile Network Operators (MNOs) are the most used digital credit channel in the banking sector. Analysis shows a significant positive correlation between the adoption of MNO-based loans and the financial performance of the banks. The findings support the idea that utilizing MNOs for loan distribution can

significantly enhance a bank's financial health by improving loan liquidity and managing credit risk profiles effectively.

5.3.2 Impact of Website-Based Loans on Financial Performance

The research indicates that website-based loans, while less common than MNO-based loans, are more frequently utilized than app-based loans in the commercial banking sector. The data demonstrates a positive correlation between the increase in website-based lending and the financial performance of banks. This suggests that expanding the use of website-based loans could significantly enhance the financial outcomes for commercial banks, highlighting their potential to boost bank performance.

5.3.3 App-Based Loans' Relation to Financial Performance

The study reveals that app-based loans are the least utilized digital-credit option compared to MNO-based and website-based loans within the commercial banking sector. While the analysis identified a positive relationship between app-based loans and financial performance, this correlation was not statistically significant. This indicates that although the adoption of app-based lending is increasing, its direct influence on the financial performance of banks remains unclear and requires further investigation to determine its potential impact.

5.4 Recommendations on objectives

5.4.1 For MNO-Facilitated Loans

Given the significant positive impact of MNO-facilitated loans on financial performance, commercial banks are encouraged to expand strategies that promote the use of such loans. This could involve lowering the costs and interest rates associated with these loans. It is also recommended for regulatory bodies to establish policies that encourage the use of MNO-facilitated loans, thereby supporting banks in capitalizing on this channel.

5.4.2 For Website-Based Loans

In light of the significant contribution of website-based loans to financial performance, it is advisable for banks to improve their web-based lending services. Enhancements could include streamlining the loan application process and making the fees more competitive. Promotional campaigns could also be employed to further attract customers to this lending platform.

5.4.3 For App-Based Loans

Although app-based lending was not shown to significantly influence financial performance, banks are still encouraged to innovate and refine their app-based lending strategies. Further research into the efficacy of mobile application lending could uncover new opportunities for enhancing financial outcomes.

5.5 Recommendations for Practice

5.5.1 Recommendations to The Authorities for Implementation

The study's findings suggest that authorities, including regulatory bodies and policymakers, should consider encouraging the development and expansion of digital credit services due to their positive impact on the financial performance of commercial banks. It is recommended that authorities create a supportive regulatory environment that promotes innovation while ensuring customer protection and the stability of the financial system. This could include the development of clear guidelines for digital lending practices, supportive legislation for fintech startups, and frameworks for data security and privacy. Additionally, authorities should consider facilitating partnerships between banks and technology providers to further enhance the digital credit ecosystem. These measures would not only foster growth in the banking sector but also promote financial inclusion, benefiting the broader economy.

5.5.2 Recommendations to Service Users/Beneficiaries

Service users, particularly customers of commercial banks utilizing digital credit services, stand to gain from the enhanced access and convenience these services offer. Users should be encouraged to take advantage of the financial literacy programs provided by banks to better understand the benefits and risks associated with digital credit. Educating service users on responsible borrowing, understanding terms and conditions, and the importance of maintaining a good credit history are essential practices that can lead to more beneficial outcomes for both customers and financial institutions. Beneficiaries should also be advised

to engage with platforms that offer the best terms and to use digital credit as a tool for financial empowerment and economic advancement.

5.5.3 Recommendations to Other Stakeholders

Other stakeholders, including financial industry analysts, fintech companies, and investors, should recognize the strategic importance of digital credit services. Banks and fintech companies should continue to innovate and improve the user experience, security, and range of digital credit offerings. They should invest in research and development to create more tailored products that meet the diverse needs of their customers. For investors, the study highlights the potential for sustainable returns in the sector, supporting initiatives that contribute to the proliferation and enhancement of digital credit services. All stakeholders should collaborate to enhance the digital financial ecosystem, ensuring that it remains robust, secure, and responsive to the changing needs of the economy and its participants.

5.6 Recommendations for further research in this field of study

Future research could broaden the current study's framework to include various financial entities like microfinance institutions, which might display different patterns in digital-credit adoption. Comparative studies with the emerging digital lender sector could yield valuable insights as well. Utilizing diverse research methodologies and gathering primary data could enhance the depth of understanding regarding the impact of digital credit on financial performance. Given the ambiguous results related to app-based loans, further investigation is warranted to clarify their potential influence on financial outcomes. This

area presents a significant opportunity for deeper exploration to fully understand how app-based lending might affect the financial health of banks and other financial institutions.

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Appendix I: Research Instruments

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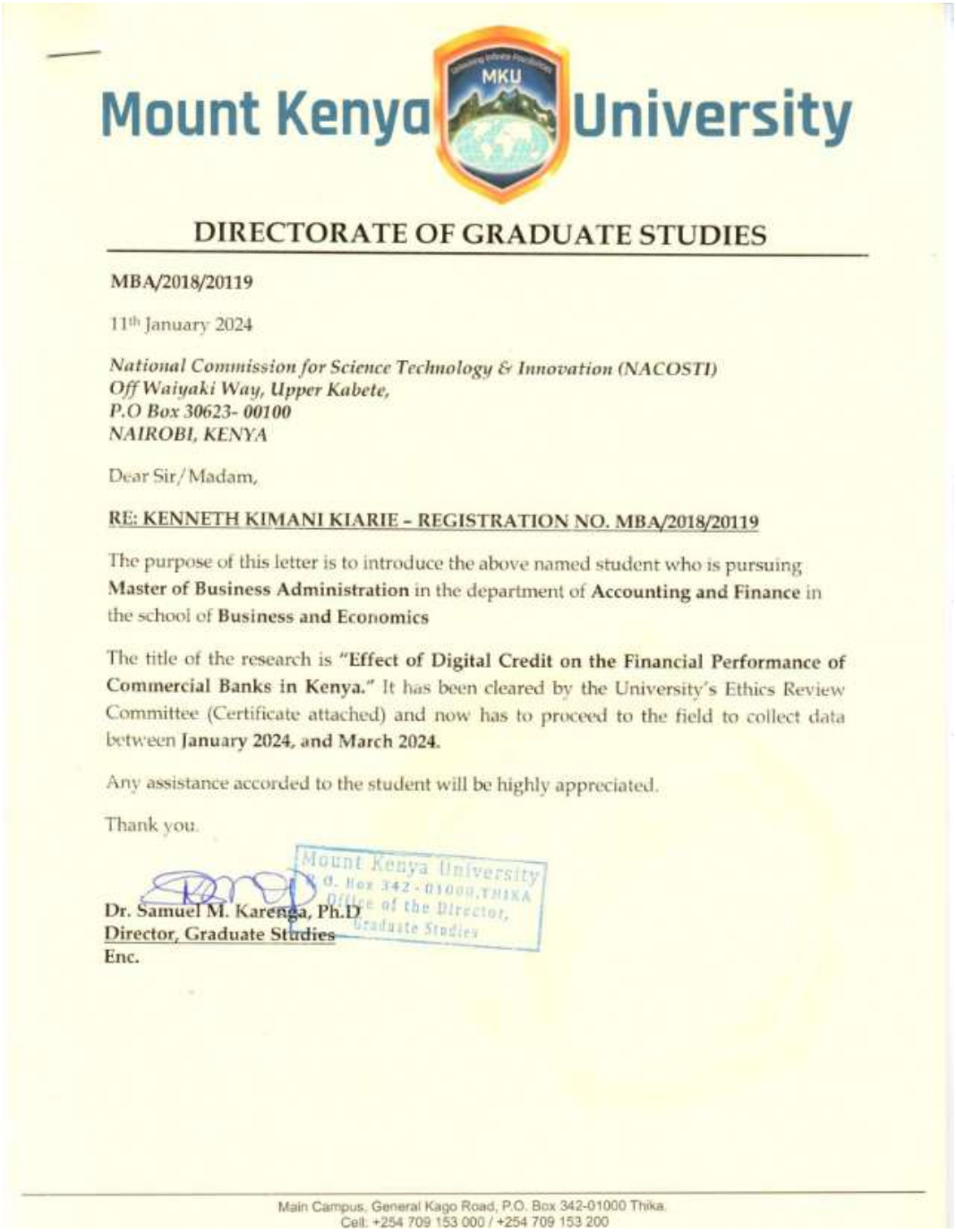
Appendix II: Letter of Introduction



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MBA/2018/20119

11th January 2024

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: KENNETH KIMANI KIARIE – REGISTRATION NO. MBA/2018/20119

The purpose of this letter is to introduce the above named student who is pursuing **Master of Business Administration** in the department of **Accounting and Finance** in the school of **Business and Economics**

The title of the research is **"Effect of Digital Credit on the Financial Performance of Commercial Banks in Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **January 2024, and March 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000,THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 / +254 709 153 200

Appendix III: Ethical Clearance Certificate

Mount Kenya University

REF: **MKU/ISERC/3015** Date: 09 January 2024
TO: **KENNETH KIMANI KIARIE**
REG: **MBA/2018/20119**

Dear Sir/Madam,

RE: EFFECT OF DIGITAL CREDIT ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2059.** The approval period is **09/01/2024 - 08/01/2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
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Email: info@mku.ac.ke, Web: www.mku.ac.ke
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Appendix IV: Research Permit from NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **195595**

Date of Issue: **18/January/2024**

RESEARCH LICENSE

This is to Certify that Mr.. Kenneth Kimani Kiarie of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: EFFECT OF DIGITAL CREDIT ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA for the period ending : 18/January/2025.

License No: **NACOSTI/P/24/32584**

195595

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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See overleaf for conditions

Appendix V: Similarity index report

EFFECT OF DIGITAL CREDIT ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.

by Kenneth Kiarie

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