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

Kenneth Kiarie.
Student, Department of Accounting and Finance, Mount Kenya University, Kenya.
Dr. Ruthwinnie Munene.
Lecturer, Department of Accounting and Finance, Mount Kenya University, Kenya.

Citation: Kiarie, K., Munene, R. (2024). Effect of digital credit on the financial performance of commercial banks in Kenya. *International Academic Journal of Economics and Finance, 4*(1), 368-386.

ABSTRACT

The rapid adoption of digital technologies has transformed the banking industry globally, with digital loan products becoming increasingly prominent. In Kenya, commercial banks have embraced these technologies to expand their market reach and enhance financial performance. This study embarked on an exploration to assess the impact of digital loan products on the financial performance of commercial banks in Kenya, spanning 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 within a positivist framework, the study analysed data from five banks that had been active in providing digital-credit services for over a decade, using information from the Central Bank of Kenya and publicly available financial records. Both descriptive and inferential statistical methods, including correlation and regression analyses, were used to explore the nuanced relationships between digital lending channels and bank performance.

The findings indicate a strong preference for MNO-based loans, with website-based and app-based loans also utilized but to a lesser extent. There was a significant positive correlation between the financial performance of banks and the uptake of MNO-based and website-based loans. In contrast, app-based loans, despite increasing usage, did not show a statistically significant impact on financial metrics. This highlights the varied influence digital-credit platforms have on bank financial health, with MNO-based loans playing a critical role and website-based loans also contributing positively to bank performance.

The study recommends that banks further integrate and enhance MNO-based services and improve the user experience for website-based loans to capitalize on their financial benefits. Despite the lesser impact of app-based loans, there remains potential for innovation in this area. Additionally, the research suggests future studies could broaden their scope to include other financial institutions and compare these findings with the digital lender market to deepen understanding of digital-credit adoption and its impacts.

Key words: Digital-credit, Mobile network operator (MNO), Website-based platforms, Mobile applications, Financial Performance.

INTRODUCTION

Background of the Study

Commercial banks are pivotal in economic growth, acting as intermediaries that stimulate economic activity by making capital more accessible (Nnabugwu, 2021). With the banking environment being

competitive and highly regulated, banks are pushed to innovate and embrace technological advancements to enhance their services and expand their customer base (Demombynes & Thegeya, 2012). In Kenya, the rise of mobile money services has revolutionized banking, culminating in the rapid adoption of digital credit services. The introduction of M-Shwari in 2012 marked a significant development, setting the stage for a dynamic shift in the banking sector towards mobile and digital services (Mollo, 2017).

The evolution of mobile money into digital credit platforms has been rapid in Kenya, with significant consumer adoption and a growing array of services. Banks and non-banking financial institutions have collaboratively expanded digital credit offerings, with services like M-Shwari becoming mainstream within a few years. These developments have prompted banks to integrate digital credit into their core offerings, reflecting the sector's lucrative potential and the need to understand its impact on financial performance (Totolo, 2018).

Statement of the problem

Despite the popularity of digital credit, the sector remains under-regulated, with issues such as high fees and a lack of comprehensive data on clients. This underdevelopment poses challenges, including the potential exploitation of consumers and the need for a robust regulatory framework. The study seeks to address these challenges and explore the implications of digital credit on the financial performance of banks (Gwer et al., 2019).

Purpose of the study

The study aims to bridge the knowledge gap regarding the impact of digital credit on the financial performance of commercial banks in Kenya, considering the rapid growth and significant changes in the banking sector facilitated by technological advancements.

Objective of the study

General objective
To assess the effect of digital credit on the financial performance of commercial banks in Kenya.

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.

Research hypothesis
i. Website credit has no effect on financial performance of commercial banks.
ii. Credit based Apps has no effect on financial performance of commercial banks.
iii. Mobile network operator credit has no effect on financial performance of commercial banks.

Significance of the Study

This research is crucial as it provides empirical evidence for strategic decision-making in banks, helps in regulatory framework development, and enriches academic literature by detailing the impacts of digital credit on the financial landscape of Kenya.

Scope of the study

The research targets the commercial banking sector in Kenya from 2012 to 2022, focusing on the introduction and adoption of digital credit services and their financial impacts.

Study Limitation

The novelty of digital credit limits the availability of long-term data, affecting the breadth of historical analysis. The specificity to Kenya's banking sector may not fully represent global banking trends.

Delimitation of study

Focusing on Kenya, a pioneer in mobile banking and digital finance, provides a rich context for studying digital credit's impact on banking performance over a crucial ten-year period that saw the rise of significant digital finance services (Business Daily, 2018).

Assumptions of the study

The study assumes stability in other factors affecting banks' financial performance, focusing solely on the impact of digital credit services. It presumes that the selected banks represent the broader market dynamics of digital finance in Kenya.

LITERATURE REVIEW

Introduction

This literature review serves as a critical foundation for the study, synthesizing existing research on digital credit and its impact on the financial performance of commercial banks. By examining relevant theories, empirical evidence, and identifying research gaps, this chapter sets the stage for the exploration of how digital credit influences banking operations and financial outcomes.

Empirical Review

Website Credit and Financial Performance

Extensive research, such as studies by Ngango (2015) and Wainaina (2017), has meticulously illustrated the transformative effect of electronic banking, particularly website credit, on the

operational efficiency and financial metrics of commercial banks. These studies underscore the significant improvements across several key performance indicators such as capital adequacy, asset quality, profitability, operational efficiency, earnings consistency, liquidity status, and market risk management. Enhancements in these areas are primarily facilitated through increased operational efficiency in core banking functions—depositing, withdrawing, conducting balance inquiries, and processing payments can now be performed with unprecedented ease and speed via mobile phones, internet banking, agents, or ATMs. The digitalization of these services not only streamlines operations but also significantly enhances customer value by offering convenience and reducing transaction times. This shift towards digital platforms not only aligns with contemporary consumer expectations for quick and efficient service but also provides banks with a substantial competitive advantage in a rapidly evolving financial landscape. The adoption of digital banking allows financial institutions to meet the increasing demand for instantaneity and accessibility in banking services, crucial factors in retaining customer loyalty and expanding customer base.

Website-Based Lending and Bank Profitability

The transition to digital lending platforms signifies a pivotal shift towards modernization and efficiency in the banking industry. Research by Martinez and Rodriguez (2022) and findings from global studies such as those by Johnson and Kwak (2019) provide in-depth analyses on the substantial cost savings and new market opportunities afforded by digital lending. These platforms reduce dependence on traditional bank branches, which significantly lowers operational costs and increases the efficiency of the loan approval and distribution processes. The streamlined and automated nature of online lending not only cuts down on operational expenses but also enhances customer satisfaction by providing quick and easy access to financial services. Moreover, studies like O'Reilly (2018) have highlighted how digital lending platforms provide a significant competitive edge by appealing to a digital-native clientele, indicating that such platforms are crucial in capturing and retaining younger, technology-oriented customers who prefer quick, efficient, and accessible financial services. Wallace and Gachunga (2020) further elaborate on the scalability of website-based lending, emphasizing its ability to allow banks to rapidly adapt their services to meet evolving market demands without the significant costs associated with altering physical infrastructure.

Mobile Network Operator Credit and Financial performance

The integration of mobile network operators in extending credit services represents a significant innovation in the banking sector. The collaborative efforts between commercial banks and telecommunications companies utilize extensive customer data to assess creditworthiness and provide financial services to a broader segment of the population. Studies like those by Suri et al. (2021) and Wamalwa et al. (2019) focus specifically on products like M-Shwari and their impact on enhancing financial inclusion by making credit accessible to larger segments of the population, including those traditionally underserved by the banking system. These studies have shown that MNO-facilitated credit helps in increasing the financial resilience of households by providing diverse credit options. The success of these initiatives in extending financial services has been crucial in promoting greater economic participation and enhancing the financial well-being of

underserved populations. This approach has not only expanded the reach of financial services but also played a pivotal role in the financial inclusion agenda by leveraging technology to bridge the gap between traditional banking services and the needs of the modern consumer.

Mobile Network Operator Credit and the Financial Ecosystem

The cooperative ventures between telecommunications companies and financial institutions have been instrumental in fostering a more inclusive financial ecosystem. Research by Omondi and Patel (2021) highlights how MNO credit has brought previously excluded groups into the formal financial sector, thus enhancing their economic participation and financial stability. This integration into the financial ecosystem is further supported by studies like those by Baker and Kumar (2020), who discuss the competitive pressures that MNO credits introduce, compelling traditional banks to continuously innovate to meet the demands of a digital-first customer base. Additionally, Green and Morisson (2019) explore the regulatory challenges and opportunities within this evolving landscape, advocating for adaptive regulatory frameworks that support innovation while ensuring consumer protection and maintaining financial stability.

Credit based on Apps and Financial Performance

The advent of credit-based apps has marked a significant transformation in the banking sector by enabling personalized and accessible financial services. Studies by Letting (2019) and Kinyanzui (2018) have highlighted how these platforms have revolutionized lending, particularly for small and medium-sized enterprises (SMEs). These apps facilitate quick creditworthiness assessments and provide tailored financial products, allowing businesses to secure financing that had previously been beyond their reach due to stringent borrowing conditions of traditional banking. The success of these platforms in providing flexible and responsive financial products has significantly increased the volume of annual lending and improved customer satisfaction by simplifying the borrowing process and enhancing the accessibility of financial services. This shift towards app-based banking has not only met the growing customer demand for convenience and efficiency but also contributed significantly to the operational performance and profitability of banks.

Credit-Based Apps and Risk Management Efficiency

Innovations in app-based lending have significantly enhanced banks' abilities to manage and mitigate credit risks. Studies by Gupta and Lee (2023) and Williams and Singh (2020) detail how advanced data analytics and machine learning have revolutionized risk assessment, allowing for a more nuanced and accurate evaluation of borrower profiles. These technologies enable real-time monitoring and dynamic adjustment of lending criteria, thereby significantly reducing the incidence of loan defaults and enhancing the overall health of loan portfolios. The automation of risk management processes facilitated by app-based platforms allows banks to implement more sophisticated credit scoring models that incorporate a variety of data points including transaction history, social media activity, and other digital footprints, which traditional models might overlook. This comprehensive approach to risk assessment not only reduces the banks' exposure to potential defaults but also enables them to extend credit to a broader customer base, thereby enhancing their

market reach and financial inclusivity. Furthermore, the agility offered by app-based lending platforms in adapting to changing market conditions and borrower behaviours contributes to more robust financial performance and strategic flexibility within banks.

Strategic Implications of Digital-Credit Products

The strategic deployment of digital-credit products is reshaping the competitive landscape of the banking industry, providing institutions with the tools to tap into new market segments and enhance their operational agility. According to Kim and Chung (2020), digital credit offers banks an unparalleled opportunity to differentiate their service offerings and cater to the evolving preferences of a digitally-savvy consumer base. By leveraging digital credit, banks can not only enhance their product portfolios but also improve their customer engagement strategies, thereby attracting and retaining customers in a highly competitive market. Lambert and Davidson (2021) emphasize the market expansion potential of digital-credit products, particularly in reaching unbanked and underbanked segments, thus contributing to greater financial inclusion and societal equity. This strategic expansion into new customer demographics allows banks to cultivate a broader client base, increasing their deposit and lending opportunities and enhancing overall profitability. Moreover, the adoption of digital-credit products facilitates a deeper integration of financial services, combining traditional banking with innovative digital solutions to create a seamless customer experience that supports sustained business growth and customer loyalty.

Theoretical Assumptions

Modern Portfolio Theory

Applying Modern Portfolio Theory to banking, this study posits that banks consider digital credit as a strategic component of their loan portfolios to manage risks and enhance returns effectively. According to Markowitz's theory, diversification helps in balancing the risk-return profile of the portfolio by mixing different types of investments. In the context of digital credit, banks are diversifying their credit offerings to include digital loans that cater to various customer needs and risk profiles, potentially stabilizing their financial performance against market volatilities. This strategic diversification is particularly relevant in today's digital age, where consumer preferences and financial technologies evolve rapidly, requiring banks to adapt quickly to maintain competitiveness and financial stability (Markowitz, 1952).

Credit Risk and Credit Risk Mitigation Theory.

In line with Credit Risk and Credit Risk Mitigation Theory, banks employ both specialized and diversified lending strategies to manage credit risks effectively. The dual approach allows banks to exploit their sector-specific expertise while mitigating risks associated with economic downturns and market dynamics. Specialization in certain types of lending, such as mortgages or commercial loans, enables banks to develop in-depth knowledge and tailored risk management strategies, potentially leading to lower default rates. Conversely, diversification across different loan types and customer segments spreads the credit risk and reduces potential losses from any single investment or economic sector. This balanced approach to credit risk management is crucial for maintaining the financial health of banks and ensuring long-term sustainability (Saunder & Cornett, 2011; Jonghe, 2013).

## The Capital Asset Pricing Model Theory

The Capital Asset Pricing Model provides a framework for banks to evaluate the risk-return profiles of their investments, including digital credit products. By using CAPM, banks can assess how well digital credit initiatives are expected to perform against market risks, thereby making informed

decisions about these investments. This theoretical model helps banks price the risk associated with digital loans and predict their potential returns based on systematic market factors. It allows financial institutions to strategically allocate resources to digital credit initiatives that are expected to yield higher returns relative to their risk level, aligning investment decisions with the bank's overall risk management and financial strategies (Markowitz, 1952; French, 2003).

Arbitrage Pricing Theory

Arbitrage Pricing Theory offers a multifactor approach to asset pricing, which is particularly relevant for evaluating digital credit products in the banking sector. This theory suggests that returns on assets, including digital loans, can be predicted by considering multiple macroeconomic factors that influence systemic risks. By applying APT, banks can tailor their digital credit offerings to reflect the specific economic and market conditions affecting their operations, enabling them to price these products more accurately and manage the associated risks effectively. This approach allows banks to exploit opportunities for arbitrage that may arise when digital credit products are mispriced relative to their risk, potentially leading to higher returns and better alignment with the bank's financial objectives (Ross, 1976; Chen, 2007).

Conceptual framework
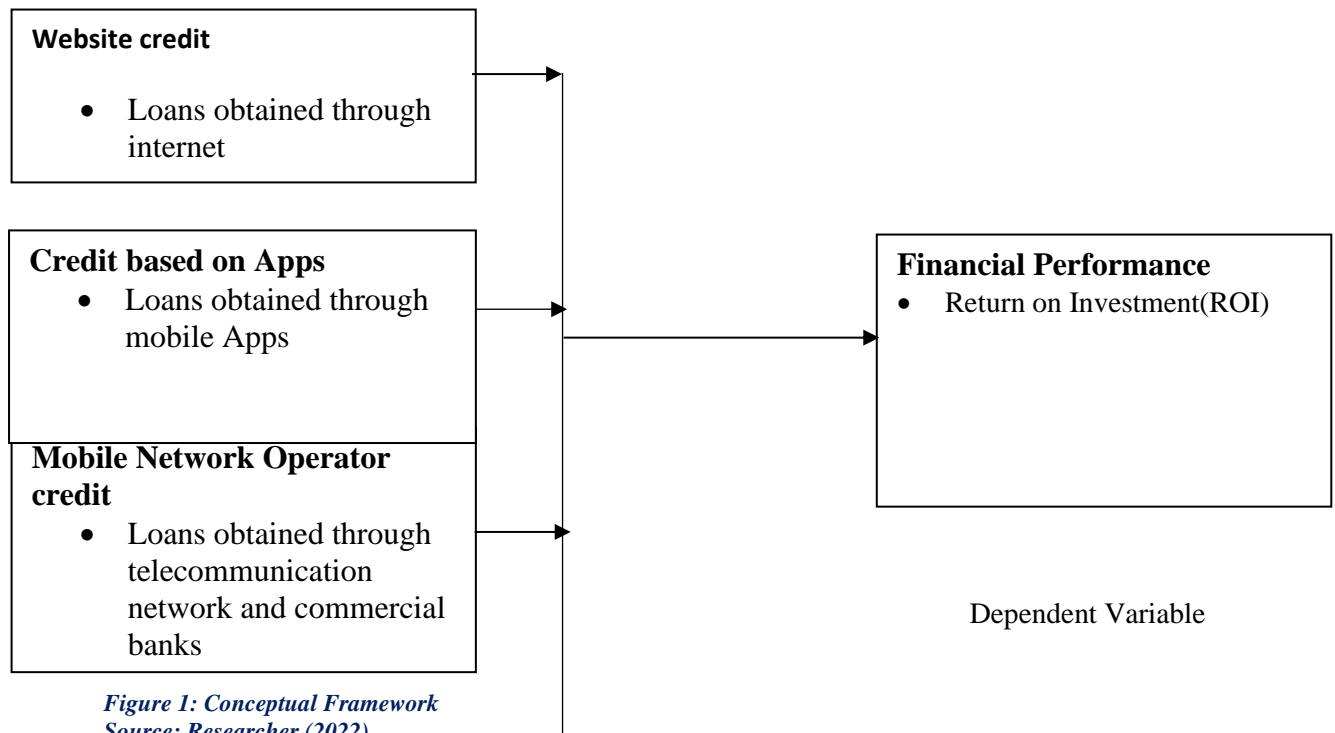
Figure 1: Conceptual Framework
Source: Researcher (2022).

LITERATURE REVIEW

The review of existing literature on digital credit within the banking sector reveals its significant impact on operational efficiencies, risk management, and strategic positioning. Despite the extensive benefits documented, gaps remain in understanding the full impact of digital credit on long-term bank profitability and risk management, particularly in dynamic and diverse markets such as Kenya. This study aims to fill these gaps by providing a comprehensive analysis of how digital credit influences financial performance, customer engagement, and competitive dynamics in the banking industry. Through a detailed examination of empirical and theoretical perspectives, the

study will contribute to a deeper understanding of the strategic implications of digital credit products for commercial banks.

RESEARCH METHODOLOGY
Introduction

This section outlines the methodologies used in this research, including the design approach, data collection instruments, and analysis strategies to explore the impact of digital credit on the financial performance of commercial banks in Kenya.

Research methodology

A quantitative desktop research methodology was employed, utilizing existing datasets and secondary data sources, such as financial statements and industry publications. This approach was aimed at identifying trends and correlations relevant to digital credit's impact on banking performance metrics.

Research Design

A non-experimental, Causal Comparative research design was used to analyse the effects of digital credit services, focusing on detailed evaluations of a selected number of banking events and their financial outcomes.

Location of the Study

The research was conducted in Kenya, utilizing publicly available data from commercial banks, specifically audited financial reports spanning from 2012 to 2022.

Target Population

The target population included 41 registered commercial banks in Kenya, as reported by the Central Bank of Kenya (CBK).

Sampling procedures and techniques

Purposive sampling was employed to select banks with over ten years of digital credit operations. Banks such as CBA with M-Shwari, Co-operative Bank with M-Coop Cash, and others known for their digital services were included.

Sample population

The sample consisted of five commercial banks that had a long history of providing digital credit, chosen to provide insights into the long-term financial impacts of digital credit services.

Research instruments

Data was collected using a document analysis checklist, which helped systematically review and extract financial performance data related to digital credit services from existing documents and reports.

Validity and Reliability

Data reliability was ensured by using audited financial reports that adhered to International Financial Reporting Standards (IFRS) or Generally Accepted Accounting Principles (GAAP).

Data collection methods and procedures

Secondary data was collected from banks' audited financial reports, Kenya Bankers Association annual reports, and CBK publications, among other sources, using a carefully designed document analysis checklist.

Data Analysis Techniques

Data was analysed using "R" statistical software. Descriptive and inferential statistical tools were used to evaluate relationships and establish causal effects between digital credit and financial performance, employing simple regression analyses to test hypotheses related to website credit, app-based credit, and mobile network operator credit.

Ethical Considerations

Ethical clearances were obtained, and data was handled with the utmost integrity to respect the sensitivity of the financial information used in the study.

RESEARCH FINDINGS AND DISCUSSIONS

Introduction

This segment outlines the outcomes of the data examination. It utilizes descriptive statistical methods, including correlational studies and multiple regression analyses, to clarify the findings detailed in this discussion.

Research presentation, interpretation and discussions

4.2.1 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: Descriptive Results

Table 4.1 presents the outcomes of a descriptive analysis. encompassing a ten-year dataset. The analysis reveals significant fluctuations in loan distributions via Mobile Network Operators (MNOs) by different banks. The smallest and largest loans observed were Shs 2,187,996.89 and Shs 98,050,900.45, respectively. The mean loan value associated with MNOs was identified as Shs 47,973,643.92, with a variability (standard deviation) of Shs 22,413,287.60, showcasing a broad disparity in the loan amounts issued by the banks in question.

When assessing loans sourced from websites, the range was found to be from Shs 7,041,252.36 to Shs 52,810,622.96, with an average loan amount of Shs 29,062,871.17 and a standard deviation of Shs 10,795,170.70. This indicates a relatively lower utilization of website platforms for loan issuance compared to MNO channels.

The review of loans obtained through banking applications showed values ranging between Shs 9,033,139.61 and Shs 29,189,146.01, with an average of Shs 20,484,470.10 and a standard deviation of Shs 4,943,989.00. These numbers suggest that loans via banking apps are less popular among bank customers, highlighting a predominant preference for loans via MNOs.

Furthermore, the evaluation of banks' total assets demonstrated a significant spread from Shs 107,730,009.42 to Shs 1,554,030,000.00, with an average asset value standing at Shs 483,131,108.07 and a standard deviation of Shs 317,823,287.56. This reveals a wide variance in the financial foundation of the banks analysed.

Inferential Analysis

The inferential statistical analysis undertaken included comprehensive assessments through correlation analyses and multiple regression.

ANOVA tests

One-way ANOVA test

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

Table 4.2: One-way ANOVA test results.

In the ANOVA focusing on banks, revealed an F-statistic value of 1.341968 and a P-Value of 0.267488. The F-statistic represents the ratio of variance between the groups to the variance within the groups, where a higher value often suggests more distinct separation between the group means. However, given that the P-Value is above the standard significance cutoff of 0.05, it indicates that the variation in net income across different banks does not reach statistical significance. Consequently, the null hypothesis, which posits no variance in net income among the banks, is not rejected.

The year-based ANOVA yielded an F-statistic of 0.70437 and a P-Value of 0.715222, significantly above the conventional significance level. This high P-Value signals that the differences in net income across various years are not statistically significant, leading to the retention of the null hypothesis that there is no discernible difference in net income throughout the years.

In summary, the ANOVA tests indicate that within our dataset's confines, significant differences in net income due to specific banks or years do not exist. It suggests that net income remains consistent across these divisions, with any observed variations likely due to chance rather than to inherent differences among the banks or temporal changes.

Two-way ANOVA test

	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		

Table 4.3: Two-way ANOVA Results

To assess the impact on net income by different financial entities and over time, a two-way Analysis of Variance (ANOVA) was conducted examining the variables 'Bank' and 'Year.' The analysis showed that the variation due to different banks produced a sum of squares around 2.81×10^{14} with four degrees of freedom, and an F-statistic of 1.267215 alongside a P-value of approximately 0.298861, failing to meet the significance level of $p < 0.05$. This indicates that there is no significant difference in net income among the banks as per the available data.

In the examination of the temporal effects, the sum of squares was about 4.00×10^{14} for ten degrees of freedom, yielding an F-statistic of 0.721481 and a P-value of around 0.699526. This significantly exceeds the 0.05 threshold, suggesting no statistically significant variation in net income across the years studied.

Furthermore, the residual sum of squares, indicating the variance not explained by the bank and year variables, was calculated at approximately 2.22×10^{15} for forty degrees of freedom. This highlights the variance in net income that cannot be accounted for by the two examined factors. Overall, the analysis suggests that the differences in net income across various banking institutions and over different years do not exhibit statistical significance. This implies that observed variations are likely due to random fluctuations rather than any consistent, underlying factors related to the bank or year.

Pearson product-moment correlation analysis.

		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 4.3: Correlation Matrix

The analysis presented in Table 4.2 reveals that there is a significant positive correlation between the uptake of loans initiated via Mobile Network Operators (MNOs) and the financial outcomes of commercial banks. The data suggests that increases in MNO-sourced lending are associated with improved financial metrics within these institutions. Similarly, the evidence suggests a constructive link between the proliferation of website-originated loans and the financial health of banks. It is inferred that banks could benefit from the expansion of their loan services through websites. Additionally, the introduction or expansion of loan services accessed through applications (apps) is shown to have a positive relationship with the banks' financial metrics, implying that such strategic enhancements could be beneficial for their financial robustness.

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

Table 4.3: Ordinary Least Squares (OLS) regression analysis

The Ordinary Least Squares (OLS) regression analysis, with net income as the dependent variable, yielded the following statistical outcomes. The coefficient of determination, R-squared, is 0.645, suggesting that approximately 64.5% of the variance in net income can be explained by the independent variables in the model. The adjusted R-squared is slightly lower at 0.624, accounting for the number of predictors in the model, which indicates a robust fit.

The F-statistic is 30.86, and the probability of the F-statistic is exceedingly low (1.62e-11), which provides strong evidence against the null hypothesis that the model with no independent variables

fits the data as well as the specified model.

The regression coefficients suggest that MNO-based loans ($\beta = 0.1635$, $p < 0.001$), website-based loans ($\beta = 0.2352$, $p = 0.002$), and app-based loans ($\beta = 0.1073$, $p = 0.527$) have different impacts on net income. The positive coefficients indicate that there is an increase in net income associated with each of these types of loans. However, it's noteworthy that the impact of app-based loans is not statistically significant at conventional levels ($p > 0.05$).

The model diagnostics indicate that the residuals are fairly normally distributed, as evidenced by the Jarque-Bera test ($JB = 1.063$, $\text{Prob}(JB) = 0.588$), which does not reject the null hypothesis of normality. The Durbin-Watson statistic is 1.815, which is close to the value of 2, suggesting there is no strong evidence of autocorrelation in the residuals.

The standard errors of the coefficients indicate the precision of the coefficient estimates, with smaller values indicating more precise estimates. The t-statistics are used to determine if the coefficients are significantly different from zero, and in this model, the coefficients for MNO-based loans and website-based loans are statistically significant, while the coefficient for app-based loans is not.

In summary, this model suggests that MNO-based loans and website-based loans are significant predictors of net income for the banks, while app-based loans are not, although they do contribute to the model. The overall fit of the model is good, and the diagnostics do not suggest any major violations of the OLS assumptions.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The final chapter comprehensively summarized the outcomes of the study, offering a synthesis of the key findings and proposed recommendations derived from the research. Additionally, this section outlined potential avenues for future research to build upon the insights garnered from this investigation.

Summary of the result findings

The primary aim of this study was to examine the impact of digital loan products on the financial outcomes of commercial banks in Kenya throughout a comprehensive ten-year timeframe, extending from 2012 to 2022. Our focus centered on quantifying the effects of three digital loan facilitation channels—mobile network operator (MNO) loans, website-based loans, and application-based loans—on the financial performance of a select group of Kenyan commercial banks.

The research adopted a descriptive survey methodology and a positivist paradigm to guide its inquiry. Initially, 41 commercial banks were identified as potential participants; however, the study

was concentrated on five banks, which were chosen based on having operational digital-credit services for a period of 10 years or more. The data, covering a decade, was obtained from the Central Bank of Kenya and the publicly available records. This data was systematically analysed through descriptive and inferential statistical methods, including correlation and regression analyses. Diagnostic evaluations ensured that the data met the assumptions necessary for regression analysis, confirming the suitability of the multiple regression method for this study.

The analyses indicated that over the ten-year period, MNO-based loans were the most utilized among the loan types within the sampled banks, followed by website-based loans, with app-based loans being the least. Correlation analysis revealed strong associations between MNO-based loans, website-based loans, and app-based loans with financial performance. Regression analysis further identified a statistically significant positive relationship between MNO-based loans and website-based loans with financial performance. However, app-based loans did not present a statistically significant correlation with the financial performance metric in the regression model. These insights underscore the varying degrees of influence that different digital-credit platforms exert on the financial health of banks.

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.

Influence of MNO-Facilitated Loans on Financial Performance

The research findings suggest that loans facilitated by mobile network operators (MNOs) are the most prevalently adopted digital-credit channel within the banking sector. The analysis revealed a significant positive correlation between the uptake of MNO-based loans and the financial performance of the banks. The study corroborates the notion that leveraging MNOs for loan distribution could substantially improve a bank's financial standing by enhancing loan liquidity and credit risk profiles.

Impact of Website-Based Loans on Financial Performance

The study found that website-based loans are less prevalent than MNO-based loans but more so than app-based loans within the commercial banking landscape. The increase in website-based lending was found to correlate positively with the financial performance of banks. Consequently, the study underscores the potential of website-based loans to bolster the financial performance of commercial banks, suggesting that an increase in their utilization could be beneficial.

App-Based Loans' Relation to Financial Performance

App-based loans, as per the study's findings, are the least utilized form of digital-credit when compared to MNO-based and website-based loans. The analysis showed a positive relationship between app-based loans and financial performance, though the correlation was not statistically

significant. This suggests that while the adoption of app-based lending is on the rise, its direct impact on financial performance is yet to be established.

Recommendations

Future studies could extend the scope of this research to encompass other financial entities such as microfinance institutions, which may exhibit different dynamics in digital-credit adoption. Comparative analyses with the burgeoning digital lender sector could also provide valuable insights. Employing varied research methodologies and primary data collection could offer a more granular understanding of the impact of digital-credit on financial performance. Given the inconclusive findings regarding app-based loans, there is an opportunity for further exploration to elucidate their potential effects on financial performance.

REFERENCES

Anderson, E. J. (2013). *Business risk management: models and analysis*. John Wiley & Sons.

Athansasoglou, P., Brissimis, S. And Delis, M. (2006), "Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Journal of International Money and Finance, Vol. 19, No. 6, pp. 813-832.

Basel Committee on Banking Supervision (BCBS). (2005). International Convergence of Capital Measurement and Capital Standards: A Revised Framework: A Revised Framework.

Boeve, R., Duellmann, K., & Pfingsten, A. (2010). Do specialization benefits outweigh concentration?

CBA. (2013). *M-Shwari. Retrieved from M-Shwari*: https://cbagroup.com/m-shwari/

CBA. (2015). *M-SHWARI_TERMS_AND_CONDITIONS*. Retrieved from Safaricom: https://www.safaricom.co.ke/images/Downloads/Terms_and_Conditions/M SHWARI_TERMS_AND_CONDITIONS.pdf

CBA. (2018). *What is M-Shwari. Retrieved from CBA Bank*: https://cbagroup.com/m-shwari/what-is-m shwari/

CBK. (2018). *Central Bank of Kenya. Nairobi: Central Bank of Kenya. Retrieved from Central Bank of Kenya*: https://www.centralbank.go.ke/

CBK. (2019). *Bank Supervision. Retrieved from Central Bank of Kenya*: https://www.centralbank.go.ke/bank-supervision/

Cecchetti, S. G., & Schoenholtz, K. L. (2010). *Money, Banking, and Financial Markets*. Mcgraw-Hill.

Chen, G., & Mazer, R. (2016). *"Instant, Automated, Remote: The Key Attributes of Digital Credit*. Washington, D.C: CGAP.

Cook, T., & mckay., C. (2015). *How M-Shwari Works: The Story So Far*. CGAP and FSD Kenya.

Dang, U. (2011). *The CAMEL rating system in banking supervision. A case study*. Arcada University of Applied Sciences.

Demombynes, G., & Thegeya, A. (2012). Kenya's mobile revolution and the promise of mobile savings. *World Bank policy research working paper*, (5988).

Freedman, D. A. (2012). *Statistical Models: Theory and Practice*. Cambridge University Press.

George, G. E., Miroga, J. B., Ngaruiya, N. W., Mindila, R., Nyakwara, S., Mobisa, M. J., . . . Moronge, M. O. (2013). *An Analysis of Loan Portfolio Management on Organization Profitability: Case of Commercial Banks in Kenya*. Research Journal of Finance and Accounting, 24-35.

GNU. (2019). *The R Project for Statistical Computing*. Retrieved from The R Project: https://www.r project.org

Guisse, M. L. (2012). *Financial Performance of the Malaysian Banking*. Eastern Mediterranean University.

Gwer, F., Gubbins, P., Totolo, E., & Odero, J. (2019). *Cost of Banking 2019*. Nairobi: FSD Kenya.

Hamisu, S.K. (2011). Credit risk and the performance of Nigerian banks. *Journal of Business Administration, Vol. 13* No 1 and 2.

Hawkins, D. (2017). Uniform Financial Institutions Rating System. *Wisconsin Law Journal*.

Investopedia. (2013, 06 15). *Corporate Culture*. Retrieved from Investopedia: https://www.investopedia.com/terms/c/corporate-culture.asp

Jonghe, T. O. (2013). *Lending Concentration, Bank Performance and Systemic Risk: Exploring Cross Country Variation*. Policy Research Working Paper 6604.

Kingiri, A. N., & Fu, X. (2019). Understanding the diffusion and adoption of digital finance innovation in emerging economies: M-Pesa money mobile transfer service in Kenya. *Innovation and Development*.

Kithinji, A. (2010). Credit Risk Management and Profitability of Commercial Banks in Kenya. Unpublished MBA Project, University of Nairobi.

Koivu, T., 2002, Does Financial Development Affect Economic Growth in Transition Countries? Paper presented at the BOFIT seminar, Bank of Finland, 20 May 2002.

Mollo, A. (2017). *M-Shwari loan access and effects on employment and investment in youth-owned mses in Ongata-Rongai, Kenya* (Doctoral dissertation, University of Nairobi).

Nnabugwu, O. C. (2021). Effect of Financial Intermediation On The Development Of Small And Medium Scale Enterprises In Anambra State Nigeria.

Risks in credit portfolios of German banks? *Available at SSRN 2794048.*

Saunders, A., & Cornett, M. M. (2011). *Financial Institutions Management: A Risk Management Approach*. Mcgraw-Hill.

Sroufe, R. (2018). *Integrated Management: How Sustainability Creates Value for Any Business*. Emerald Publishing.

Stettner, M. (2016). *How to Establish a Promotional Mix*. Retrieved from Edwar Lowe Foundation: http://edwardlowe.org/how-to-establish-a-promotional-mix/

Suri, T., & Gubbins, P. (2018). How is Digital Credit Changing the Life of Kenyans? Evidence from an Evaluation of the Impact of M-Shwari.

Tallberg, B. (2021). The financial development of a double-edged sword?.Totolo, E. (2018). The digital credit revolution in Kenya: an assessment of market demand, 5 years on. *CGAP*.

Wanjala, P. S. (2016). *The effects of fiscal policy on foreign direct investment inflows in Kenya for the period 2000-2014* (Doctoral dissertation, United States International University-Africa).

Winton, A. (1999). Don't put all your eggs in one basket? Diversification and specialization in lending. *Diversification and Specialization in Lending (September 27, 1999).*

Ngango, M. A. (2015). Electronic banking and financial performance of commercial banks in Rwanda: A case study of bank of Kigali. Unpublished MBA Project. Jomo Kenyatta University of Agriculture and Technology.

Wainaina, N.J. (2017). Mobile based loan management practices and financial performance of commercial banks in Kenya. *Journal of Electronic Commerce Research, 16*(7), 3-7.

Totolo, E. (2018). The digital credit revolution in Kenya: an assessment of market demand, 5 years on. *CGAP*.

Suri, T., Bharadwaj, P., & Jack, W. (2021). Fintech and household resilience to shocks: Evidence from digital loans in Kenya. *Journal of Development Economics*, *153*, 102697.

Wamalwa, P., Rugiri, I. W., & Lauler, J. (2019). *Digital credit, financial literacy and household indebtedness* (No. 38). KBA Centre for Research on Financial Markets and Policy Working Paper Series.

Gubbins, P., & Totolo, E. (2018). Digital credit in Kenya: Evidence from demand-side surveys. *Financial Sector Deepening (FSD) Kenya. Available online: https://fsdkenya. Org/publication/digital-credit-in-kenya-evidence-from-demand-side-surveys/ (accessed on 16 April 2020).*

Kinyanzui, K. (2018). *Effect of Mobile Credit on Bank Performance: Evidence from Commercial Banks in Kenya* (Doctoral dissertation, United States International University-Africa).

Ross A. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory 13*, 1976.