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EFFECT OF INTERNET BANKING, CREDIT INFORMATION SHARING ON CREDIT RISK OF SELECTED COMMERCIAL BANKS IN KENYA

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Abstract: **Lending risk, the possibility of borrowers defaulting on loans, is a significant concern for financial institutions in Kenya. Financial institutions have been facing many challenges with high NPL ratios, indicating a concerning number of loan defaults. This has raised concern among different stakeholders in the sector. It's also a concern for the CBK who is the regulator of banks in Kenya. The economy is driven by commercial banks and therefore any instability of the banking sector can lead to serious economic shock. Therefore, this study sought to investigate the effect of internet banking, credit information sharing on credit risk of selected commercial banks in Kenya. This research considered 39 Kenyan commercial banks operational from 2014-2023. Secondary data collected was summarized, coded, and tabulated using STATA 13. Random Effect Regression Model was used for estimation and findings revealed that internet banking significantly positively affected Kenyan commercial banks' credit risk. This suggests that while credit information sharing plays an essential role in reducing credit risk, it may not substantially credit risk's relationship with tech-driven financial services. The study concluded that while the rise of tech-driven financial services offers tremendous opportunities for increasing financial inclusion and convenience, it also presents challenges in terms of managing credit risk. Given that internet banking significantly influence credit risk, commercial banks should strengthen their risk management systems specific to digital platforms.**

Keywords: **Internet Banking, Credit Information Sharing, Credit Risk.**

1. INTRODUCTION

Financial landscape has in the last decade beginning 2007 undergone major structural and technological changes. Tech-driven financial services are revolutionizing how institutions manage credit risk (Omarova, 2020). At the heart of this transformation lies a critical partnership: tech-driven financial services and credit information sharing.

Traditionally, assessing creditworthiness relied heavily on limited financial documents and credit scores. However, advancements in technology have facilitated secure credit information sharing between lenders and credit bureaus (Hohnen, Ulfstjerne, & Krabbe, 2021). This includes a borrower's credit history, repayment behavior, and outstanding debts. Access to this comprehensive data empowers financial institutions with a clearer picture of a borrower's financial health. As highlighted in the World Bank document, credit information sharing allows lenders to make informed lending decisions, ultimately reducing credit risk (Sadok, Sakka & El-Maknouzi, 2022).

Fintech goes beyond facilitating credit information sharing. Innovative technologies like mobile banking and internet banking are reshaping performance of businesses (Li, 2024). Digital platforms can analyze a broader range of data points, such as a borrower's digital footprint (transaction history, online bill payments) and cash flow management behavior. Research by Kowalewski and Pisany (2021) suggests that combining data from traditional credit bureaus and digital footprints can significantly improve the prediction of loan defaults, further mitigating credit risk.

The synergy between tech-driven financial services and credit information sharing fosters a more robust financial system. By facilitating informed lending decisions and incorporating alternative data sources, credit risk is mitigated. This translates to lower loan defaults, improved financial stability for institutions, and potentially lower interest rates for borrowers with a strong financial profile. A study by Omar and Makori (2018) finds that when customer history is availed it can help decrease uncertainties, ultimately strengthening the financial system. Future outlook of financial institutions fastens on acknowledging technological advancements and fostering collaboration with established credit information sharing systems. As the financial landscape evolves, continuous innovation in data security, privacy regulations, and responsible lending practices will be paramount to ensure a thriving and inclusive financial ecosystem.

The financial services industry is experiencing a profound digital transformation, driven by technology-powered solutions (Omarova, 2020). Fintech is reshaping how we handle money, making financial management more seamless, accessible and tailored to individual needs. By integrating technology, these innovations enhance efficiency, simplify transactions and redefine traditional banking services for a more user-friendly experience. Phone enabled apps allow for transfer funds and pay bills real time. Online investment platforms offer user-friendly interfaces for managing portfolios. Automation tools can schedule recurring payments and track expenses, simplifying financial management (Timonen, 2022).

Technology has the potential to bridge the financial inclusion gap. By leveraging alternative data sources beyond traditional credit scores, Fintech platforms can assess the creditworthiness of individuals who may not have access to mainstream banking services (Klausner & Antia, 2021). This opens doors for loans, microfinancing, and other financial products to previously underserved populations. Fintech empowers individuals with greater control over their finances. Robo-advisors provide automated investment advice previously reserved for high-net-worth individuals. Crowdfunding platforms allow for broader participation in startups and investment opportunities. This democratization of financial tools fosters a more informed and engaged consumer base.

Kenya's financial landscape posts a dynamic and growing space, acting as a vital force in shaping the nation's economic landscape (Ngumi, 2014). The Kenyan banking sector boasts a well-established network of commercial banks, alongside a growing presence of innovative Fintech companies. Traditional players offer a myriad range of financial services taking care of a complex nature of different customer needs. Fintech startups, on the other hand, leverage technology to provide more accessible and convenient financial solutions, particularly for the unbanked and underbanked population (CBK, 2023).

2. STATEMENT OF THE PROBLEM

Lending risk, is the possibility of borrowers defaulting on loans, is a significant concern for in Kenya. Financial institutions have been facing many challenges with high NPL ratios, indicating a concerning number of loan defaults (World Bank, 2023; IMF, 2024). This has raised concern among different stakeholders in the sector. It's also a concern for the CBK who is the regulator of banks in Kenya. The economy is driven by commercial banks and therefore any instability of the banking sector can lead to serious economic shock.

A study by Jappelli and Pagano (2017) explored Kenyan banks in a view to establishing the available risk mitigation measures in practice. The study established that the lending risk management techniques are key in improving the banks' financial performance. It emphasized the importance of stringent loan appraisal processes and creditworthiness evaluations. Ngugi and Nasieku (2016) investigated credit information sharing impacts on Kenya's credit risk. Their findings suggest that access to a borrower's comprehensive credit history through credit bureaus empowers banks to make informed lending decisions, leading to a reduction in credit risk. Ongore and Irungu (2013) examined how effectively credit risk management practices reduce loan defaults in Kenyan banks. Their findings emphasized vitality of continuously refining risk assessment methods to keep pace with shifting economic conditions, ensuring financial institutions remain resilient and adaptive in an ever-changing market. Mutuku (2019) explored the relationship between electronic commerce capability and performance of commercial banks in Kenya and found that information capability, customization capability and back-end integration capability were significant predictors of performance of commercial banks.

While existing studies acknowledge robust credit risk management practices, there is insufficiency of reviews specifically on how tech-driven financial services influence credit risk management in Kenya. Research on how tech-driven financial services and credit information sharing work together to mitigate credit risk in Kenyan banks remains scarce. This gap presents an opportunity to uncover how these innovations can refine risk assessment and improve loan decision-making.

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3. LITERATURE REVIEW

Theoretical Literature Review

Technology Acceptance Theory:

The goal of the TAT (Technology Acceptance speculation), which was created in 1989 by Davis, Bagozzi, and Warshaw, is studying user's intention or the extent to which emerging technologies or data systems are embraced. The intended usefulness of utilization of the latest innovations have a change on TAT design. According to the idea of technological advances perceived usefulness, using new or information-based techniques can improve a person's productivity at work. According to Baker et al. (2015), the perceived simplicity of use refers to how simple it is for someone to develop an efficient with contemporary technology and data systems.

The TAT model has increased emphasis on the relationship between perceived technology usefulness and perceived utilization of usage on new technologies. One external element that influences the perceived value and simplicity of administration is the surroundings in which an individual lives. Thus, the cornerstones of the TAM approach are perceived usefulness and simplicity of consumption, two crucial perceptual variables. The Technological Acceptance Theories, upon which this study is based, asserts that mindsets of micro financing bank executives and members that they serve through online banking services must be addressed before achieving the goal for technological acquisition. That is, when all sides concur that new technology must be implemented based on its perceived utility and usability. In light of this, greater profitability results from the technology's general utility and adoption.

Empirical Literature Review

Zhao, Lan and Wu (2016) did a study in China. The research employed a panel data analysis involving data from 132 Chinese commercial banks from 2009-2014. KMV default distance model was utilized to measure credit risk. The authors attribute this to the potential challenges of managing a larger customer base and identifying high-risk borrowers in an online environment.

Menlik, Mollaoglu, and Ozkan (2014) explored the factors influencing internet banking usage among individual customers in Turkey. While not directly focused on credit risk, it offers insights into potential risk management benefits. The research employed a survey methodology, collecting data from 450 internet banking users in Turkey. Utilizing structural equation modeling approach. The research found that perceived security and trust in internet banking positively impact its usage. Additionally, convenience and efficiency were identified as key drivers of internet banking adoption. The study suggests that by addressing security concerns and promoting the convenience of internet banking, banks can encourage wider adoption. Increased internet banking usage can potentially lead to improved customer communication and data collection, allowing banks to develop more informed risk management strategies.

Durai and Stella (2019) did a study in internet banking, on financial inclusion. Financial inclusion involves providing access to various services. Internet banking, categorized as digital finance, has transformed the banking industry, enabling affordable, convenient, and secure banking services delivered through digital channels like mobile phones and the internet. Internet banking empowers individuals with greater control over their finances, quick decision-making, and efficient payment processing. Overall, digital finance, including internet banking, plays a pivotal role in achieving financial inclusion, benefiting both financial institutions and customers.

Agufa (2016) explored the impact of digital finance, including internet banking, on a research which focused on financial institutions. Regression and correlation analyses were applied to secondary data from these institutions. Surprisingly, the findings revealed a digital finance was not a major contributor. This counterintuitive outcome suggested that banking institutions primarily adopted digital financial services to reduce operational costs and improve profitability rather than enhance financial inclusion. The review advocated for enhanced awareness initiatives to promote the widespread adoption and utilization of digital financial services.

4. RESEARCH METHODOLOGY

This research considered 39 Kenyan commercial banks operational from 2014-2023. Data utilized by the examination was documents review of the banks Audited Financial Statements and bank supervision reports by CBK from 2014 to 2023. Data was captured using secondary data extraction form Random Effect Regression Model was used for estimation.

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Descriptive (mean, frequency and standard deviation), correlation, and inferential statistics and regression analysis with the aid of STATA 13 was utilized. To expedite data understanding and description, findings will be displayed as frequencies and percentages in tables.

5. FINDINGS

The descriptive statistics results on internet banking are presented in Table 1.

Table 1: Internet Banking

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Internet Banking Value	390	890.8798	624099	36042.04	66008.66
Valid N (listwise)	390				

Internet banking had a moderate average transaction value over the years, indicating steady adoption by both individuals and corporate clients. The high standard deviation reflects significant variability among banks or across years some banks or years experienced extremely high usage, while others had minimal activity. The large gap between the minimum and maximum values underscores the uneven penetration and uptake of internet banking services in the Kenyan banking sector.

Regression Analysis Results

Table 2: Model Summary

Credit Risk	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Internet Banking	0.094	0.021	4.450	0.000	0.052	0.135
_cons	0.087	0.012	7.370	0.000	0.064	0.110

Model Summary

Number of obs = 390

Number of groups = 39

R-sq: within = 0.4480

Wald chi2(4) = 329.34

Prob > chi2 = 0.0000

The Wald chi² statistic is 329.34, (p=0.0000), signaling strong statistical significance at the 1% level, confirming that at least the explanatory variable (internet banking) has a meaningful influence on credit risk. In other words, the model is robust enough to suggest a real and measurable connection between digital banking methods and the likelihood of credit risk exposure.

R-squared within value is 0.4480. This suggests that internet banking explain 44.80% of credit risk. While this is a moderate explanatory power, it indicates that the model explains fairly credit risk variation. The coefficient of 0.094 indicates that for every additional unit in total value of internet banking transactions, credit risk rises by 0.094. With a z=4.450 and p=0.000, the relationship is highly significant at 1% level, confirming strong statistical link. Simply put, as internet banking transactions grow, credit risk is likely to increase.

The coefficient of 0.093 indicates that for every additional unit in the total value of mobile banking transactions, credit risk rises by 0.093. With a z-value of 4.050 and a p-value of 0.000, the relationship is highly significant at the 1% level, confirming a strong statistical link. Higher mobile banking transactions are associated with higher credit risk.

The coefficient of 0.101 indicates that for every additional unit in the total value of ATM banking transactions, credit risk rises by 0.101. With z=9.030 and p=0.000, the relationship is highly significant at the 1% level, again confirming a strong statistical link. Increased ATM banking transactions contribute to a rise in credit risk.

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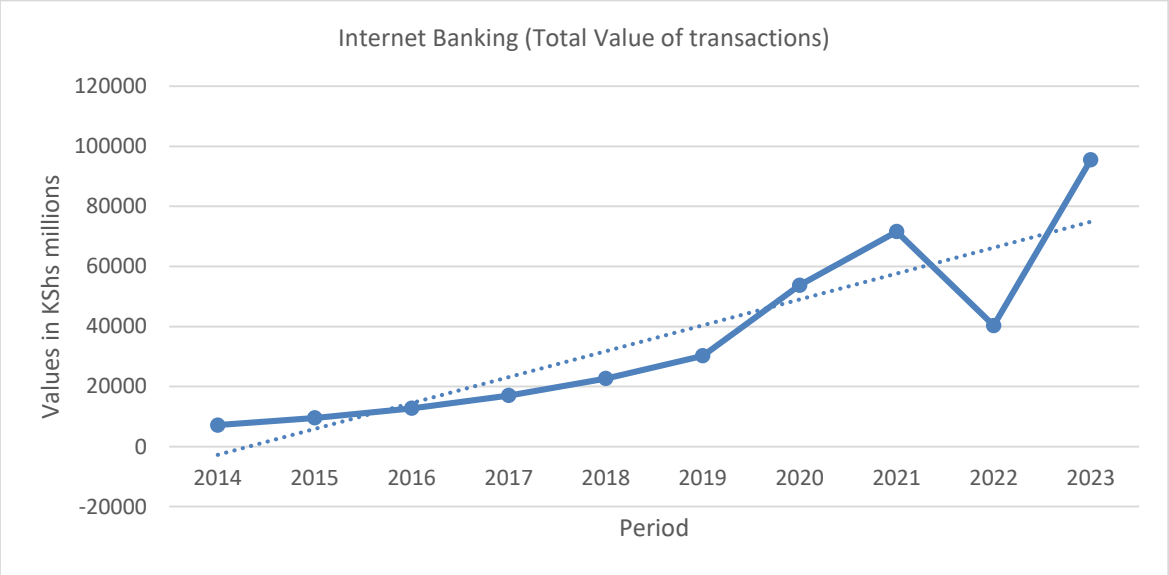
The internet banking (0.094) positively notably affect Kenya commercial banks credit risk. The significant positive relationships suggest that as the value of transactions in these tech-driven financial services increases, credit risk also increases, highlighting electronic transactions high volume potential risks.

The data presented shows the total annual value of internet banking transactions (in millions of Kenyan Shillings) for the period 2014–2023. This provides a clear picture of how internet banking adoption and usage have evolved over the past decade in Kenya's commercial banking sector.

Figure 1: Trend in Internet Banking Transactions (2014–2023)



During this period, the value of internet banking transactions grew steadily, increasing more than fourfold from KSh 7.17 billion in 2014 to KSh 30.21 billion in 2019. This growth reflects increased adoption of digital banking platforms by both individual and corporate clients, likely driven by improvements in internet infrastructure, financial literacy, and online security. The data shows a clear upward trajectory in the value of internet banking transactions over the last decade, despite a temporary dip in 2022. The growth underscores the increasing digital transformation in Kenya's banking sector, as banks leverage internet banking to improve service delivery, reduce operational costs, and enhance customer convenience. The surge during the pandemic and the sharp growth in 2023 highlight how external factors (like crises or innovation) can accelerate digital adoption.

Table 3: Descriptive Statistics on Credit Information Sharing:

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Credit Information Sharing (number of client credit reports shared by commercial banks with various credit referencing bureaus)	390	8139	560520	136963.7	135017.5
Valid N (listwise)	390				

On average, banks shared or accessed approximately 136,964 credit reports during the observed periods insinuating active engagement in credit information sharing, a key mechanism for credit risk assessment and borrower profiling. The descriptive statistics highlight the growing importance of credit information sharing in Kenya's banking sector. The broad variance in usage points to an evolving landscape where some institutions have embraced the technology more than others. These variations could potentially moderate the interplay between tech-driven financial services and credit risk, supporting study's objective on the moderating effect of CIS.

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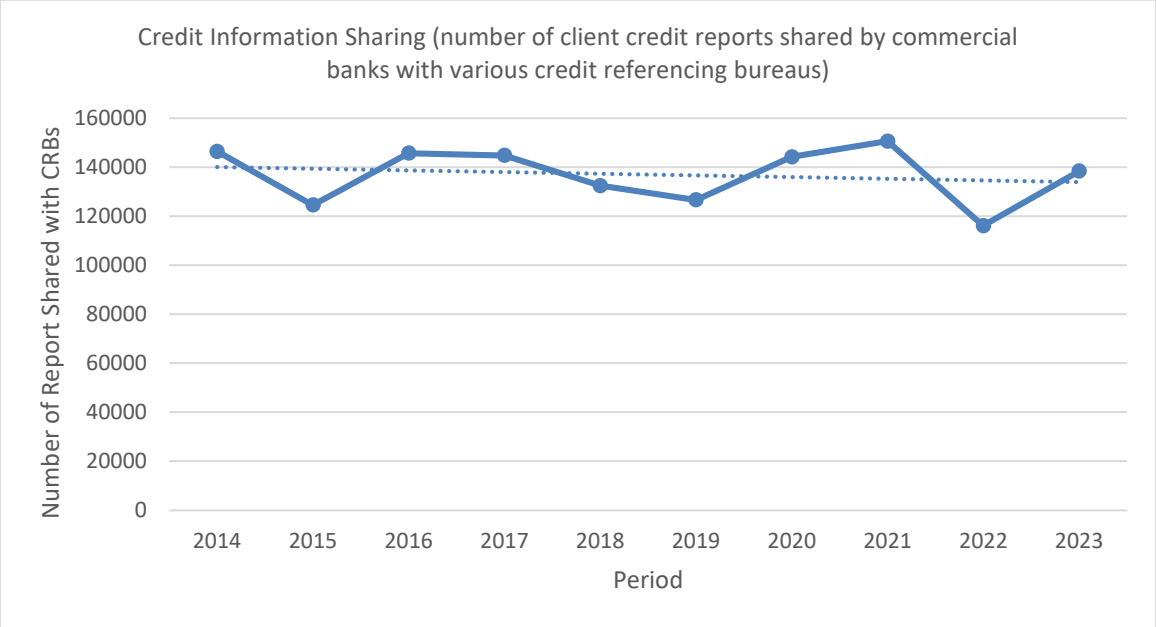
Figure 2: Credit Information Sharing



6. CONCLUSIONS

Internet banking was revealed to substantially influence credit risk. As banks increasingly adopt technologies, risks also grow, underscoring vitality of strong risk management strategies to address potential challenges associated with digital finance. While tech-driven financial services enhance financial inclusion and convenience, they also introduce new credit risk challenges. To maximize digital banking benefits without compromising financial stability, banks must adopt comprehensive risk mitigation strategies. Although widely recognized as a tool for reducing credit risk, this study found that credit information sharing does not significantly alter interplay between digital financial services and credit risk. This suggests that while valuable for overall credit management, it may not effectively mitigate risks stemming from the rapid adoption of digital banking technologies.

7. RECOMMENDATIONS

Internet banking significantly impact credit risk, commercial banks need to bolster their risk management framework for digital finance. This means investing in real-time fraud detection, advanced cybersecurity measures and more sophisticated credit scoring models. AI-driven tools can help monitor and predict customer credit behavior across digital platforms, enabling banks to identify high-risk borrowers early and reduce loan defaults linked to tech-based lending.

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