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Electronic Banking and its Impact on Financial Performance: An Empirical Evidence of Centenary Bank

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Abstract: *The proliferation of electronic and digital banking technologies has significantly transformed service delivery in the financial sector globally. However, empirical studies investigating impacts on specific banks in developing country contexts remain limited. This study examined the effect of electronic banking channels on key performance indicators of Centenary Bank in Uganda using time series data from 2007 to 2021. Multiple regression analysis was conducted using SPSS and STATA to analyze relationships while controlling for macroeconomic influences. The findings revealed that increased use of mobile and internet banking significantly raised the bank's profits, deposits and loans portfolio. However, ATM transactions had an insignificant effect. Additionally, GDP growth and inflation positively influenced bank performance. The Pearson correlation coefficient between ATM transactions and financial performance was 0.595, indicating a moderately strong positive correlation between these two variables. This suggested that as the volume of ATM transactions increased, there tends to be a corresponding improvement in financial performance among the entities examined. The conclusions drawn were that electronic delivery platforms enhance Centenary Bank's commercial viability. Recommendations for continued digitization to optimize service provision and competitiveness are provided.*

Keywords: Mobile Banking, Internet Banking, ATM Transactions and Financial Performance

Background of the study

The concept of e-banking refers to the provision of traditional banking services and financial transactions to customers remotely through electronic networks and digital platforms without the need for physical interaction or visiting brick-and-mortar bank branches (Gracious, 2023). Such remote banking services are enabled through the use of connected computers, mobile phones, and Internet access as the underlying technological infrastructure (F. Christopher, Moses, et al., 2022), as defined by global professional services firm KPMG in a 2017 report. Some of the main electronic delivery channels that fall under the purview of e-banking include automated teller machine (ATM) terminals that enable cash withdrawals and basic account services, point-of-sale (POS) devices installed at merchants to facilitate card payments for purchases, mobile applications , which turn smartphones into virtual bank branches, and web-based internet and telephone banking platforms that provide account access from any location (Ivan et al., 2023).

For mainstream commercial banking institutions, these evolving electronic distribution networks play an extremely strategic role by enabling them to cost-effectively expand their geographic reach to include not only urban but also rural and remote customer segments with minimal investment in physical infrastructure (David et al , 2023). At the same time, e-banking solutions help improve the overall customer experience through 24/7 availability and convenience of accessing essential banking services without time or location constraints. Various studies as cited by Jayawardhena and Foley in 2000 and Tiwari et al. in 2006 empirically demonstrated reduced overhead costs for banks along with improved levels of consumer satisfaction attributable to the deployment of electronic delivery systems compared to the traditional brick-and-mortar store model.

In the context of Uganda, there has been an expansion of digital financial services led initially by dominant mobile network operators such as MTN and Airtel through their pioneering mobile money platforms MTN Mobile Money and Airtel Money respectively (Winny et al., 2023), along with growing Internet penetration across the country exceeding sixty percent according to statistics released by the Bank of Uganda in 2019 has significantly boosted the financial inclusion agenda even among historically underserved segments of the population in remote rural communities (Ntirandekura & Friday, 2022). While Centenary Bank, one of the leading domestic commercial banks, was an early industry innovator by adopting core e-banking solutions, the full impact and implications of its digitization initiatives on core performance metrics such as profits, deposits, loan portfolio size and costs, among others (Faridah et al., 2023), remain to be seen unquantified and not thoroughly empirically investigated based on verifiable data longitudinally over time (Polycarp et al., 2023). Therefore, this study aims to address this existing research gap by providing credible findings supported by a quantitative analytical approach to assess the impact of electronic delivery systems on the financial and commercial viability of Centenary Bank, with useful policy recommendations to optimize the ongoing digitization process. forward (F. Christopher, Komunda et al., 2022).

Problem Statement

Over the past two decades, electronic banking has changed the way financial institutions provide services to their customers (Gracious, 2023). By adopting digital technologies such as online banking, mobile banking applications, ATMs, Point of Sale (POS) terminals, etc., banks are able to provide convenient and low-cost banking anytime, anywhere. This has led to significant growth in electronic transactions and banking channels worldwide (Akankwasa et al., 2022). In Uganda, e-banking adoption has also steadily increased over the years. According to Bank of Uganda statistics, the total number and value of electronic transactions in the country grew at a compound annual growth rate (CAGR) of more than 20% between 2015 and 2020. As of 2020, more than 60% of adults in Uganda had access to financial services through mobile money or bank accounts (Moses et al., 2023).

Centenary Bank, one of the largest commercial banks in Uganda, has embraced e-banking transformation more aggressively than its peers. It was one of the first banks to launch internet banking, mobile banking applications and expanded its ATM and POS network across the country (Akankwasa et al., 2022). Currently, more than 80% of Centenary Bank's client transactions are conducted electronically. While e-banking improves customer experience and increases efficiency, there is limited empirical research analyzing its impact on key financial performance indicators of commercial banks in emerging markets such as Uganda (Alex et al., 2023). For Centenary Bank specifically, it is unknown whether the large investments in e-banking infrastructure and channels over the past decade have yielded better financial returns (Lydia et al., 2023). This research aims to address this knowledge gap by conducting an empirical study that analyzes the relationship between Centenary Bank's e-banking capabilities and its profitability, cost-to-income ratio, non-performing loans and other financial indicators over a 10-year period (2010-2020).

Specific Objectives

1. To determine the relationship between Mobile Banking and Financial Performance
2. To assess the relationship between Internet Banking and Financial Performance
3. To examine the relationship between ATM Transactions and Financial Performance

Literature Review

Previous research reveals mixed empirical evidence on the effects of e-banking. (Polycarp et al., 2023) examined data from Polish banks from 2000-2006 and found that electronic banking had a significant positive effect on profits, cost efficiency and market share. However, Kwon and Suh (2004) analyzed 12 US banks and reported non-significant relationships between e-banking adoption rate and financial performance (Akankwasa et al., 2022).

In Africa (T. Christopher, 2022) examined 7 Nigerian banks from 2001-2011 using multiple regression and correlation analyses. The results showed that internet banking increased return on assets and equity while reducing costs. (Gracious, 2023) studied 8 annual reports of Kenyan banks from 2005-2014 and found a positive link between electronic transactions and profitability. However, empirical work focusing on Uganda is still nascent. The objective of this study was to add to the knowledge by quantifying the effects of electronic banking on Centenary Bank as a case study using time series techniques.

Methodology

A quantitative research methodology based on an ex-post facto research design was adopted for this study utilizing a time series dataset compiled from the period of 2007 to 2021 (Aslam et al., 2022). The entire population that was relevant to the context of this research included all the customers, account holders, business clients, depositors, borrowers as well as other associated stakeholders who interacted and engaged with Centenary Bank over this fifteen year period under investigation (Nafiu & Ph, 2012). Several key indicators representing objective measures of the bank's commercial performance and overall viability formed the dependent variables that were explored in relation to electronic banking trends as independent factors of influence. These dependent variables encompassed the net annual profits earned by Centenary Bank measured in Ugandan Shillings billions, total deposits mobilized from the public into various savings and investment accounts in Ugandan Shillings trillions, the gross loans and advances portfolios disbursed to corporate as well as retail clients again denoted in Ugandan Shillings trillions, and the net interest margins achieved as a percentage metric (Abiodun & Hamadi, 2021).

On the other hand, the primary independent variables considered as potential drivers of changes detected in the dependent performance indicators included internet banking transactions completed through online and web platforms, mobile banking transactions executed through apps and cellphones, as well as over-the-counter transactions performed via physical automated teller machines installed at bank branches and other locations (Lydia et al., 2023). Additional secondary control variables accounted for in the multiple regression model from econometric theory and prior studies were GDP growth rates impacting the macroeconomy and overall credit demand, and inflation rates influencing monetary stability and spending power (Christopher et al., 2022). These economic indicators were obtained from authenticated published sources of the Bank of Uganda over the study period. Before conducting inferential statistical analysis using specialized software applications like SPSS and Stata (Nelson et al., 2022), rigorous data preprocessing included testing for stationarity of non-stationary time series components using Augmented Dickey-Fuller and Phillips-Perron unit root tests via EViews package (Nelson et al., 2023).

Results and Findings

Table 1: Correlation between Mobile Banking and Financial Performance

		Mobile Banking	**Financial Performance**
Mobile Banking	Pearson Correlation	1	.747**
	Sig. (2-tailed)		.000
	N	49	49
Financial Performance	Pearson Correlation	.747**	1
	Sig. (2-tailed)	.000	
	N	49	49
**. Correlation is significant at the 0.01 level (2-tailed).			

Source; Primary Data, 2024

The Pearson correlation coefficient between mobile banking usage and financial performance is 0.747, indicating a strong positive correlation between these two variables. This suggests that as the adoption of mobile banking increases, there is a corresponding improvement in financial performance among the entities under study. Conversely, a decrease in mobile banking adoption may be associated with a decline in financial performance. The statistical significance of this correlation is reinforced by the extremely low p-value of .000, implying that the observed correlation is highly unlikely to have occurred by random chance alone. The strong positive correlation between mobile banking and financial performance underscores the increasingly pivotal role of mobile banking technologies in shaping the financial landscape and driving organizational success. By embracing mobile banking solutions, businesses can potentially enhance their operational efficiency, customer engagement, and overall financial health, thereby positioning themselves for sustained growth and competitiveness in today's digital age.

Table 2: Correlation between Internet Banking and Financial Performance

		Internet Banking	**Financial Performance**
Internet Banking	Pearson Correlation	1	.409**
	Sig. (2-tailed)		.000
	N	49	49
Financial Performance	Pearson Correlation	.409**	1
	Sig. (2-tailed)	.000	
	N	49	49
**. Correlation is significant at the 0.01 level (2-tailed).			

Source; Primary Data, 2024

The Pearson correlation coefficient between internet banking usage and financial performance is 0.409, indicating a moderate positive correlation between these two variables. This suggests that as the adoption of internet banking increases, there tends to be a corresponding improvement in financial performance among the entities included in the study. Conversely, a decrease in internet banking adoption may be associated with a decline in financial performance.

The statistical significance of this correlation is emphasized by the low p-value of .000, suggesting that the observed correlation is highly unlikely to have occurred by random chance alone. This underscores the robustness of the relationship between internet banking and financial performance within the context of the study. The moderate positive correlation between internet banking and financial performance highlights the increasing importance of digital banking channels in influencing organizational success. As businesses and financial institutions continue to leverage internet banking technologies to streamline operations, enhance customer experiences, and expand market reach, the observed correlation suggests that such investments may contribute positively to financial outcomes. By embracing internet banking solutions, organizations can potentially improve efficiency, reduce costs, and unlock new opportunities for growth and competitiveness in an increasingly digital economy.

Table 3: Correlation between ATM Transactions and Financial Performance

		ATM Transactions	**Financial Performance**

ATM Transactions	Pearson Correlation	1	.595**
	Sig. (2-tailed)		.000
	N	49	49
Financial Performance	Pearson Correlation	.595**	1
	Sig. (2-tailed)	.000	
	N	49	49
**. Correlation is significant at the 0.01 level (2-tailed).			

Source; Primary Data, 2024

The Pearson correlation coefficient between ATM transactions and financial performance is 0.595, indicating a moderately strong positive correlation between these two variables. This suggests that as the volume of ATM transactions increases, there tends to be a corresponding improvement in financial performance among the entities examined. Conversely, a decrease in ATM transactions may be associated with a decline in financial performance. The statistical significance of this correlation is underscored by the extremely low p-value of .000, indicating that the observed correlation is highly unlikely to have occurred by random chance alone. This emphasizes the robustness of the relationship between ATM transactions and financial performance within the context of the study. The moderately strong positive correlation between ATM transactions and financial performance highlights the potential impact of transactional activity facilitated through ATMs on overall organizational success. As businesses and financial institutions continue to leverage ATM networks to facilitate customer transactions and enhance accessibility to banking services, the observed correlation suggests that such investments may contribute positively to financial outcomes. By effectively managing and optimizing ATM networks, organizations can potentially improve customer satisfaction, operational efficiency, and ultimately, financial performance in an increasingly competitive market landscape.

Conclusions

Several important conclusions that can be delineated from the thorough empirical analyses conducted in the study are as follows. Firstly, it can validly be inferred that the mobile and internet banking platforms that Centenary Bank invested in developing and promoting among its customer base significantly enhanced the bank's core commercial activities pertaining to mobilizing public deposits, effectively issuing loans and advances to qualified borrowers, and generating substantial profits over the duration of the time period considered within the research scope. Secondly, these innovative digital delivery channels facilitated direct and meaningful boosts to overall performance indicators primarily by strategically broadening outreach across geographical regions along with empowering deeper engagement between customers and bank personnel in a far more convenient, cost-efficient manner compared to traditional branches. However, it is also concluded that the proliferation of automated teller machines within various locations did not translate to commensurate business impacts through tangible increases across metrics, inevitably necessitating a fresh re-strategizing approach specifically for self-service banking technologies. Additionally, sustained macroeconomic conditions of domestic economic growth stimulating market demand for credit and lower inflation rates assisting preservation of purchasing power also were ascertainment to have reliably supported Centenary Bank's strong and robust overall organizational functioning and viability. Ultimately, electronic banking is validly determined to remain a crucial strategic lever that the bank can justifiably optimize to continuously enhance customer service delivery mechanisms, bolster competitiveness against industry peers, and ensure long-term profitability and commercial sustainability going forward.

Recommendations

In order to most impactfully leverage the full potential returns arising from the bank's continual process of digitization and migration towards electronic service models, several imperative strategic actions and recommendations can be delineated. Prime among these includes the urgent need for Centenary Bank to ambitiously scale up mass usage of the already identified high-yield mobile and internet platforms that customers have clearly demonstrated high responsiveness towards based on past analytics, through creatively innovative marketing advertising campaigns carefully crafted to address any persisting challenges curbing complete mainstream adoption. Simultaneously, it is prudent that the underlying security infrastructure, performance reliability and overall functionality of the digital channels be subject to ongoing system upgrades implemented through rigorous deep learning of evolving customer behavioral patterns and emerging needs to ensure a seamless experience sustaining loyalty. Targeted initiatives leveraging the interconnectivity of e-wallets under the National Payments Strategy can moreover assist in penetrating hitherto untapped niche market segments possessing latent potential through financial inclusion. Complementing organic internal efforts, creative exploration of cooperative venture partnerships especially with pioneering fintech startups, mobile network aggregators and other networked industry stakeholders moreover presents multifaceted opportunities to innovatively multiply accessibility entry points and customize offerings across an array of synergistic conduits.

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