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Electronic Banking and Financial Performance of Commercial Banks

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Abstract
Purpose: The purpose of this study is to examine how the adoption of electronic banking services affects financial performance of commercial banks in Cameroon. The study aims to provide evidence on whether electronic banking enhances operational efficiency, customer service delivery, and profitability within the banking sector.
Methodology: This study adopted ex-post facto research design. The sample size of 5 Commercial banks in Cameroon from 2016 to 2025 constituted the sample based on judgemental sampling technique. Secondary data from the annual reports of the sampled banks under review which include reports ATMS, Mobile banking, internet banking, ROA were used. The data were captured from the annual audited financial statements and collated with the aid of SPSS. The data were analysed through multiple regression model.
Results and conclusions: The findings revealed that ATM, Internet Banking have a positive and statistically significant influence on the Return on Assets of commercial banks in Cameroon and mobile banking has a negative significant influenced on Return on asset. It thus concluded that electronic banking significantly influenced the financial performance of commercial banks in Cameroon, though the direction and magnitude of the effect vary across different e-banking channels.
Implications: ATM and internet banking positively and significantly enhance bank profitability, so continued investment in these channels is justified. Conversely, mobile banking negatively impacts returns, requiring strategic reassessment of costs, security, and pricing to reverse the trend.

Keywords: Automated Teller Machines, Internet Banking and Return on Assets

1. Introduction

In the past, banks carried out their operations manually. According to Ogbuji (2012), this traditional banking system had several shortcomings: customers were required to visit the bank branch for every transaction, cash handling was expensive, service delivery was slow, the range of services was limited, fraud was prevalent, and staff were overburdened. However, the adoption of advanced, modern technological systems is believed to address these issues while enhancing the quality of banking services (Gbanador, 2021). Fintech innovations have gradually dismantled the limitations that once confined banking to physical branches and set operating hours. As a result, fueled by rapid progress in information technology and fierce rivalry among banks, electronic banking is increasingly emerging as a primary channel for delivering financial services (Mahdi and Mehrdad, 2010).

The shift from conventional banking to digital finance marks one of the most transformative changes in the history of financial services. This progression involves a steady move away from physical branch banking toward technology-driven financial offerings (Asimiyu, 2019). The emergence of electronic banking (e-banking) introduced various electronic payment (e-payment) methods, such as automated teller machines (ATMs), mobile banking (MB), internet banking (IB), and point-of-sale (POS) terminals. According to Ogare (2013), e-banking represents a banking sector innovation that leverages internet and telecommunication networks to deliver bank products and services. As noted by Njuguna (2012), electronic payments have led to reduced check processing costs, lower paper and mailing expenses due to online bank statements, and decreased data entry needs, since customers carry out most transactions online.

According to Ogare (2013), while information technology is recognized as a means to enhance banks' financial performance, its implementation involves significant expenses. Additionally, concerns about financial insecurity in electronic banking stemming from fraud are reducing the user base, potentially lowering bank profits. Other challenges linked to e-banking include rising costs, job insecurity, and a lack of adequate skills, all of which may negatively impact banks' financial outcomes.

Financial performance is the extent to which an organizations goals and objectives related to finance are being realized. Al-Hussein et al (2018) argues it is an estimation of the results of a company's arrangements and operations in fiscal terms. It is used to measure company's general money related health over a given period of time and can be used as a comparative measure with other firms in similar Industry or to look at businesses or divisions in accumulation. Likewise, financial performance alludes to a subjective measure of how well a firm can utilize resources from its essential method of business and produce incomes.

Previoys studies focus on different aspects like customer satisfaction, customer e-engagement, the influence of a broad category of "digital financial services." There is a need for a focused, updated investigation specifically on the ATM, Internet Banking, and Mobile Banking and their direct influence on the Return on Assets (ROA) of commercial banks in Cameroon.

The most relevant Cameroonian studies cited use older data. Ngwa (2020) used data from 2006 to 2018, and Hubo et al. (2024) used data up to 2022 for their ATM survival analysis of which the financial technology evolves over time. These studies covered data from 2016 to 2025 which provided a more current perspective, capturing recent trends, technological adoption rates, and recent banking behaviors that older studies might not reflect.

In Cameroon, commercial banks are making substantial investments in telecommunications infrastructure and a range of electronic banking services. According to Tamanjong (2020), this can be interpreted as an attempt to align with international standards. Other motivating factors, as noted by Aderonke (2010), include rising customer expectations, intensifying interbank competition, the pursuit of cost reduction, the entry of new players into the market, and the goal of enhancing service quality

Electronic banking products and services offer banks several advantages, including greater operational efficiency and effectiveness, enhanced customer service and satisfaction, and an expanded customer base. These benefits contribute to quicker transaction processing and increased convenience, which in turn have a substantial effect on banks' overall performance. Although the link between commercial bank performance and e-banking has been previously debated, this issue still remains largely underexplored (Ogare, 2013)

2. Literature review

2.1 Theoritical Framework

2.1.1 The Theory of Planned Behavior

Proposed by ajzen(1983) and was used to predict human behavior. The theory suggests that intention to engage in a behavior determines an individual's behavior (Ajzen, 1991). If one intends to use electronic banking the degree to which the person may favor or unfavor the use of e-banking is the attitude in consideration of the outcomes of its use. Subjective norm is another contributing factor that may affect people's intention towards using electronic banking. Subjective norms is an individual's belief regarding important others approval or disapproval of the use of electronic banking. It relates to the persons belief

about what important people to the person would think if he or she should use electronic banking. Perceived behavioral control is the perceived likelihood that various events would occur that would encourage or discourage the use of electronic banking this includes past experience as well as expected impediments and obstacles. Lee (2000) employed (TPB) and discovered that benefits of electronic banking have encouraged its increased use in the banking sector. Previous studies on (TPB) suggested that more valuables need to be used to increase predictability.

2.1.2 Technology acceptance model

Davis (1989) formulated the Technology Acceptance Model (TAM) to elucidate the mechanisms by which users adopt and interact with novel technology. This model posits that users' decisions regarding the timing and manner of technology utilization are influenced by two principal factors: perceived usefulness (PU) and perceived ease of use (PEOU). Davis et al. (1989) characterized perceived usefulness as the extent to which an individual believes that employing advanced technology would augment their job performance. Conversely, Ezzi (2014) articulated perceived ease of use as the degree to which an individual perceives that utilizing a specific system necessitates minimal or no effort.

Davis et al. (1989) found that an information system perceived as easier to use is more likely to foster positive attitudes and increase the intention to use it, thereby improving performance. Perceived usefulness influences attitudes toward accepting an information system, and this relationship is also affected by ease of use. However, while ease of use plays a role in determining the acceptance and adoption of an information system, it may not fully explain consumer behavior when it comes to adopting internet banking.

2.2.1 Electronic Banking

Electronic banking services have revolutionized the landscape of commercial banking by enhancing the convenience and accessibility of financial services for consumers and businesses alike. With the rise of the internet and mobile technology, banks have adopted a range of electronic platforms, including online banking, mobile banking apps, and digital wallets. These services allow customers to perform transactions, access account information, and manage finances anytime and anywhere, significantly reducing the need for physical branch visits. As a result, banks can offer 24/7 services, streamline operations, and lower costs, all while improving customer satisfaction and engagement (Patel et al, 2024).

2.2.3 Mobile Banking (M-Banking)

Mobile banking refers to the utilization of a smartphone or other mobile device to execute online banking activities remotely, including monitoring account balances, transferring funds between accounts, paying bills, and locating ATMs (Kumar et al, 2023).

2.2.4 Automated Teller Machine

According to Rose (1999), an automated teller machine (ATM) is a self-contained unit that combines a computer terminal, a recordkeeping system, and a cash vault. It allows customers to access the bank's accounting system around the clock by using a card with a Personal Identification Number (PIN) or by entering a special code into the terminal, which is linked to the bank's digital records. The ATM card is typically made of plastic and features a magnetic stripe that stores all relevant customer information, including the cardholder's name, account details, card number, spending limit, and the issuing bank.

2.3 Financial Performance

Financial performance of a company refers to the means by which a company measures its ability to meet its obligations and goals as and when due.

Okoye et al (2018) observed that it can serve as a measurable variable to assess the effectiveness of a banking institution in running its daily operations. This will determine whether organizations are able to survive in the market or not. Because this determines an institution's existence as well as liquidation, hence utmost attention is expended. By "bank performance," it is often meant whether a bank has performed well enough over a trading period to achieve its goals. Presumably, the public financial accounts are the only document that provides an explanation for this.

2.4 Empirical Review

Usman et al (2025) investigated how fintech affects SME performance through the mediating role of financial inclusion in Jigawa State, Nigeria. Using a descriptive design and convenience sampling, they surveyed 352 SMEs and analyzed the data with SPSS and Smart PLS. The results showed that perceived usefulness, ease of use, and trust significantly improved financial inclusion, while responsiveness did not. Perceived usefulness and responsiveness directly enhanced SME performance, but ease of use and trust did not. Financial inclusion significantly boosted performance and partially mediated the relationship between perceived usefulness and performance, while fully mediating the link between ease of use and performance. The study concluded that fintech, especially when perceived as useful and responsive, strengthens SME performance via financial inclusion. They recommended government support for fintech development, stronger cybersecurity measures, greater financial inclusion awareness, and future research exploring mediators like regulation and infrastructure.

Esther & Victor (2025) examined Digital banking tools and savings performance in Nigeria using a quantitative research design with secondary time series data from the Central Bank of Nigeria (2009–2023), applying Phillips-Perron unit root tests and ARDL bound testing. The results showed that mobile banking (MOB) and point-of-sale (POS) systems had a positive and statistically significant impact on savings performance, while automated teller machines (ATMs) had an insignificant relationship and interest rates a negative but insignificant one; in the short run, the combined effects accounted for about 103% of the adjustment to equilibrium each month. The study concluded that digital banking tools, particularly MOB and POS, enhance savings performance by improving access and convenience, but ATM potential remains underutilized; it recommended expanding digital infrastructure in rural areas, stabilizing the macroeconomic environment, and improving digital literacy to boost national savings

Abdullahi et al (2025) conducted a study titled Technological innovations and corporate performance of deposit money banks in Nigeria using an ex-post facto research design with a census of all 33 deposit money banks in Nigeria, analyzing secondary data from 2012–2022 via pooled ordinary least squares regression. The results showed that automated teller machines (ATM), point of sale (POS), and mobile banking (MB) each had a statistically significant positive effect on earnings per share (EPS), while internet banking (IB) had an insignificant negative relationship. The study concluded that ATM, POS, and mobile banking significantly enhance corporate performance, whereas internet banking does not contribute positively; it recommended expanding ATM and POS networks, continuing mobile banking investment, and re-evaluating internet banking for cost-effectiveness.

Hubo et al. 2024 investigated the Future of ATMs in the Era of Electronic Banking in Cameroon: A Survival Analysis. The study's goal was to investigate the longevity of ATMs in Cameroon and uncover factors impacting their survival analysis. The survival analysis methodology was used to a dataset of

ATM installations and removals from 2004 to 2022. The studies revealed that the average lifespan of ATMs in Cameroon is approximately eight years. The acceptance rate of electronic banking, the use of mobile banking, and the level of urbanization are all crucial factors influencing ATM lifetime. Cameroonian banks and financial organizations must adjust their business strategy and invest in electronic banking infrastructure.

Jean and colleagues (2022) investigated the link between e-banking use and customer e-engagement in developing nations, utilizing NFC Bank Cameroon as a case study. The study sought to investigate how various technological elements of electronic financial services, as well as service-related factors, affect customer trust and e-banking usage. To validate the suggested research model, the study used partial least squares structural equation modeling (PLS-SEM). The findings demonstrated that perceived protection of personal information, as well as service-related characteristics, have a substantial effect on trust. However, faith in e-banking does not always transfer into actual use. In contrast, both technology and service-related factors influence e-banking utilization. The study has significant management implications for implementing e-banking services in poor nations.

Beloke et al. (2021) evaluated the impact of digital financial services on the financial performance of commercial banks in Cameroon. The study sought to determine the influence of digital savings, transfers, withdrawals, and payment services on bank profitability. A survey study design was used, and the Taylor linearized variance estimate approach was used to determine the impact of these services. The data demonstrated that digital savings, digital withdrawals, and digital transfers all had a favorable and considerable impact on commercial bank profitability in Cameroon. In contrast, digital payment services have a negative, albeit significant, influence on profitability. The study concluded that digital financial services can help commercial banks increase their profits.

Dobdinga (2013) conducted an empirical examination of customers' opinions of e-banking uptake in Cameroon, using an enhanced Technology Acceptance Model (TAM). The major goal was to discover the elements that influence customer attitudes toward using e-banking services. The study evaluated data using internal consistency reliability, convergent and discriminant validity of survey items. Path regression analysis results showed that perceived security, trust, service cost, utility, and accessibility all had a substantial impact on customer attitudes, which in turn drove e-banking uptake. The study stated that in order to create favorable consumer sentiments and increase the use of e-banking services, security, accessibility, and trustworthiness must be improved while e-banking services' costs are reduced.

Felix et al. (2023) performed a study to assess the influence of electronic banking on customer satisfaction inside banking institutions in Bamenda. The study employed a convenience sampling method, targeting 15 commercial banks, from which 6 were chosen, including 300 participants. The ordinary least squares (OLS) technique was utilized for model specification. The results indicated that ATMs exert a beneficial and statistically significant influence on customer satisfaction. The study revealed that internet banking favorably and significantly impacts consumer satisfaction.

Hussein and Muthoni (2018) investigated the impact of internet banking on the operational performance of commercial banks in Kenya. Their principal aim was to investigate this link. Employing a cross-sectional research design, they randomly picked sample elements to infer inferences about the larger population. Data were collected using structured questionnaires and analyzed utilizing correlation and regression techniques. The results indicated that internet banking substantially enhances the operational performance of commercial banks. Therefore, the researchers advised bank management to invest in internet banking to improve operational performance.

Ngwa (2020) analyzed the impact of electronic banking transactions on the performance of banks in Cameroon. The research utilized various proxy factors to assess e-banking usage and sought to ascertain whether the introduction of these services by commercial banks influences their profitability. The data were extracted from the financial records of several commercial banks in Cameroon and the database of the Bank of Central African States (BEAC), encompassing the period from 2006 to 2018. The study employed regression analysis, correlation analysis, and descriptive statistics to analyze the data. The findings indicated that MMT, DTF, and EPT positively influenced return on assets (ROA), while PPV and IFR adversely affected ROA. The research determined that electronic banking transactions substantially influence bank profitability.

Caroline and her colleagues (2017) investigated the impact of automated teller machines (ATMs) on the return on assets (ROA) of commercial banks listed in Kenya. The primary objective was to assess how ATMs affect ROA. The study found that ATMs have a positive and significant effect on the return on assets of Kenyan commercial banks. It concluded that there is a positive correlation between ATMs and ROA, indicating a strong relationship between the two variables.

Jedege (2014) examined how Automated Teller Machines (ATMs) affect the performance of Nigerian banks, with the specific aim of assessing the influence of ATM deployment on bank performance while taking into account fraud and service quality. Data were gathered using questionnaires administered to a convenience sample. The gathered data were statistically examined utilizing SPSS and the chi-square technique. The results indicated that, although there are certain advantages, the use of ATM terminals has only marginally enhanced the performance of Nigerian banks due to the prevalent occurrence of ATM fraud. The study concluded that banks must enhance their security protocols to combat online fraud, impose withdrawal limits for customers, send electronic notifications to customers' mobile devices for all ATM transactions, and implement an additional security layer to prevent unauthorized electronic withdrawals using another individual's ATM card.

Faiz and Samson (2019) performed a study on mobile banking innovation and its impact on the financial performance of several commercial banks in Kenya. The study sought to evaluate the impact of mobile banking innovation on the financial performance of these banks. A descriptive research methodology was employed, and data were collected via structured questionnaires. The gathered data were examined utilizing both descriptive and inferential statistics. The correlation results demonstrated a positive and significant association between mobile banking fees and financial performance. The regression coefficient study indicated that mobile banking charges, mobile banking offerings, and mobile banking efficiency are positively and significantly correlated with the financial performance of the chosen institutions. The study determined that the laws and guidelines established by the Central Bank of Kenya (CBK) exert a moderating influence on the relationship between mobile banking and the financial performance of the selected commercial banks in Kenya.

H01 Automated Teller Machines does not significantly influence the Return on Assets of Commercial Banks in Cameroon.

H02 Inernet Banking does not significantly influence Return on Assets of Commercial Banks in Cameroon.

H03 Mobile Banking does not significantly influence the Return on Assets of Commercial Banks in Cameroon.

3. Methodology

This study employed an ex-post facto research strategy, allowing for the retrospective assessment of independent factors and their potential impact on the dependent variable. This research approach entails the systematic collecting of data from various firms regarding identical key criteria over a defined timeframe to ascertain a prevalent behavioral pattern among the firms.

The study focused on five commercial banks in Cameroon, selected using a judgmental sampling technique. According to Balsely and Clover (1988), as cited in Tapang, Bessong, and Ujah (2015), a sample size of 10 percent of the total population is commonly considered more than sufficient for research purposes. This view is supported by Ogolo (1996), also cited in Tapang, Bessong, and Ujah (2015), who stated that when the population size is known, at least 10 percent of it constitutes a researchable sample. In this study, the five selected commercial banks represent 25 percent of the total population. The banks included in the sample are: Bank Atlantic, CCA Bank, NFC Bank, Ecobank, and United Bank of Africa.

Model Specification

This study adopted a multiple regression model to analyze the relationship between the variables Electronic Banking and Financial Performance. The model was used to achieve the objectives of the study.

The multiple regression model is as follows:

$$\mathbf{ROA = \beta_0 + \beta_1(ATM) + \beta_2(MB) + \beta_3(IB) + \varepsilon_t}$$

Where:

ROA= Returnn on Asset.

B1= ATMs

B2= Mobile Banking

B3= Internet Banking

β_0 = Constant or Intercept

β_1, β_2, and β_3= coefficients

ε_t = error term

The study collected secondary data from the audited annual reports of the sampled commercial banks under review which included reports on Return on asset, internet banking, mobile banking and ATMs. These data were collected for a period of ten (10)years for each bank ranging from 2016 to 2025.

The data for the dependent and independent variables were captured from the annual financial statements and collated with the aid of SPSS. The gathered data were analysed through multile regression modelling using SPSS. Bivariate and multivariate analyses was employed in exploring the

secondary data. The multiivariate statistics of mean, median, standard deviation, minimum, and maximum was used to describe the patterns of the data.

4. Results and discussion

4.1 Data Presentation with respect the effect of Automated teller Machines on Return on Asset

The data were obtained from the banks' annual reports and also from the banker's bank website. The extracted data were estimated based on a balance multiple regression analysis to determine the effect of the variables. Financial performance was proxy with return on asset (ROA), while the independent variable electronic banking was also proxy by ATM, Mobile Banking and Internet Banking.

Table 1: Model Summary

Model	R	Adjusted R Square	Std.Error of the Estitmate	Change statistice				
				R Square Change	F Cha ge	Df1	Df2	Sig F Change
1	.762	.746	.059	.762	49.015	3	46	.000

Source: Authors compilation 2026

The regression model in Table 1 shows a strong relationship between the ATM, Mobile banking, Internet banking and the dependent variable (Return on asset). The multiple correlation coefficient (R = .762) indicates a high degree of association. With an R^2 of .762, the model explains approximately 76.2% of the variance in the outcome; the adjusted R^2 (.746) accounts for the number of predictors, confirming the model's good fit. The F-change (49.015, $p < .001$) is statistically significant, meaning the inclusion of the predictors significantly improves the model compared to a constant-only baseline. The standard error of the estimate (.059) represents the average prediction error.

Table 2: Anova Test

MODEL	Sum of Squares	Df	Mean Square	F	Sig p-value
regression	.505	3	.168	49.015	.000
Residual	.158	46	.003		
Total	.663	49			

Source : Authors compilation 2026

Table 2 reveals that the regression model, which includes Automated Teller Machines (ATM), Internet Banking, and Mobile Banking as predictors of Return on Assets (ROA), is highly significant. The total variation in ROA, measured by the total sum of squares of 0.663, is partitioned into explained variation (regression sum of squares = 0.505) and unexplained variation (residual sum of squares = 0.158). With 3 degrees of freedom for regression and 46 for the residual (based on a sample of 50 observations), the mean square for regression is 0.168, which is substantially larger than the residual mean square of 0.003. The resulting F-ratio of 49.015, accompanied by a p-value of 0.000, indicates that the combined effect of the three electronic banking channels on financial performance is statistically significant at the 1% level. This confirms that the model provides a strong fit and that the independent variables collectively explain a significant portion of the variance in ROA

Table 3 Tests Results

Model	Understandized coefficients		Standardized coefficients	T	Sig	95.0% confidence internal for B	
	B	Std. Error	Beta			Lower bound	Upper bound
1 (constant)	.050	.042		1.207	.234	-.034	.134
MOBILE MONEY	-.036	.018	-.179	-2.048	.046	-.072	-.001
ATM	3.743E-006	.000	.681	7.667	.000	.000	.000
INTENET	2.203E-006	.000	.788	10.576	.000	.000	.000

Source: Authors compilation 2026

4.2 Testing hypotheses.

4.2.1 Automated Teller Machines (ATM)

The hypothesis testing revealed that the relationship between Automated Teller Machines and Return on Assets (ROA) was significant ($\beta = 0.681$, $p < 0.001$). Consequently, the null hypothesis (H0) is rejected, and the alternative (H1) is accepted, indicating that ATM has a significant positive influence on the ROA of commercial banks in Cameroon. This finding aligns with the results of Caroline et al. (2017), who also found a positive and significant effect of ATMs on the return on assets of listed commercial banks in Kenya

4.2.2 Internet Banking

The test results showed that Internet Banking has a significant relationship with ROA ($\beta = 0.788$, $p < 0.001$). The null hypothesis (H02) is therefore rejected, and the alternative (H2) is accepted, confirming that Internet Banking significantly and positively influences the ROA of commercial banks in Cameroon. This finding corroborates that of Hussein and Muthoni (2018), who established that internet banking positively and significantly affects the operational performance of commercial banks

4.2.3 Mobile Banking

The analysis found a negative but statistically significant relationship between Mobile Banking and ROA ($\beta = -0.179$, $p < 0.05$). Thus, the null hypothesis (H03) is rejected, and the alternative (H3) is accepted, meaning that mobile banking does significantly influence ROA, albeit in a negative direction. This result is consistent with the findings of Ngwa (2020) and Beloke et al. (2021), who reported that certain electronic banking transactions (including mobile-based services) can adversely affect bank profitability in Cameroon.

5. Conclusion

The findings established that ATM and Internet Banking have **a** positive and statistically significant influence on the financial performance of commercial banks in Cameroon. These results align with the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use drive technology adoption, ultimately enhancing organizational performance. Conversely, Mobile Banking was found to have a negative but statistically significant relationship with ROA. This finding may be attributed to high implementation and security costs, or the relatively nascent stage of mobile banking adoption in Cameroon, where revenue generation has not yet caught up with operational expenses.

This study concludes that electronic banking significantly influences the financial performance of commercial banks in Cameroon, though the direction and magnitude of the effect vary across different

e-banking channels. While ATM and internet banking serve as strong drivers of profitability, mobile banking currently presents a drag on financial performance, suggesting the need for strategic reassessment.

5.2 Recommendation

i)Continue and expand investment in ATM and Internet Banking infrastructure. Given their strong positive influence on ROA, commercial banks in Cameroon should prioritize network expansion, system reliability, user interface enhancements, and coverage in both urban and rural areas to maximize transaction volumes and profitability.

Ii)Conduct a strategic overhaul of mobile banking operations. The negative significant relationship between mobile banking and ROA suggests current models are cost-inefficient or underutilized. Banks should perform a cost-benefit analysis, revise pricing structures, invest in robust security systems to build customer trust, and launch customer education campaigns to drive adoption and transaction volumes.

Iii)Adopt a differentiated e-banking strategy based on channel performance. Instead of treating all digital channels uniformly, banks should allocate more resources to high-ROI channels (ATM and internet banking) while temporarily scaling back or restructuring mobile banking offerings until operational inefficiencies and security concerns are resolved.

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