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An Evaluation of the Effect of Digital Banking Channels on the Performance of Commercial Banks in Zambia

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Abstract

Customers who use digital banking can conduct transactions through a variety of secure digital channels while the bank handles data security, related risk reduction, and regulatory matters. This is accomplished by combining the newest digital technologies online and mobile banking services such as analytics, social media, creative payment methods, and mobile technology and exceeding user expectations for convenience and experience. This study aimed at evaluating the effect of digital banking channels on the performance of commercial banks with prime focus on First National Bank Zambia. A quantitative research design was used, and data was collected from a sample of 279 employees with the aid of purposive sampling technique. Multiple hierarchical regression and correlation statistics were used to analyse the data collected through the statistical package for social sciences (SPSS). The correlation and regression analysis result showed that Mobile Banking, Internet card banking, electronic banking and telephone banking have a positive correlation with commercial bank performance in terms of profitability, performance efficiency and effectiveness. The results from the regression analysis revealed that only Internet Banking ($\beta = 0.61$, p value = 0.000) and electronic card banking ($\beta = 0.36$, p value = 0.000) had a significant effect on commercial bank performance and the analysis indicates that approximately 59.1% of the variance of the business performance can be accounted for by the linear combination of internet banking and Electronic Banking.

Keywords

Digital Banking, Performance Efficiency, Effectiveness

1. Introduction

A healthy banking industry is crucial in any country, and it may have a substantial impact on economic development through providing efficient financial services. Commercial banks play a more important role in developing economies than in established countries, hence analysing the advancement of commercial bank performance has drawn most academics' attention from an emerging market viewpoint (Siddik et al., 2016). In early 2020, the COVID-19 pandemic accelerated the Zambian financial services industry into a digital mindset as the use of Digital banking channels proved to be useful during the COVID-19 pandemic period due to banks reducing operating hours and admitting few people at a time resulting in long queues.

According to the (UNCDF, 2022), Zambia has a digital economy score of 45 percent, placing it in the early stages of a digital economy. Furthermore, the nation has a digital divide of 47, which indicates 47% of Zambians are not digitally included. 34 percent of women and 56 percent of rural residents do not have access to the internet. This indicates the work that needs to be done to make digital services and products available to Zambians so they can better participate in the economy and gain from national development as highlighted by these values.

Zambia's development goal continues to place a high priority on digital technologies. The rising acceptance and usage of mobile money services in 2019 alone revealed that 69 percent of adults possessed one or more active mobile money accounts or wallets, is proof that the numerous industry stakeholders have worked to enhance the use of digital technology in their daily lives. Financial inclusion improved from 59.3 percent in 2015 to 69.4 percent in 2022, which is a necessary condition for the availability of digital financial services.

Furthermore, as the number of mobile money services supplied by mobile network providers has grown, the use of traditional banking methods has fallen dramatically over the years. In this sense, the use of formal financial services by banks in Zambia has decreased from 24.8 percent to 20.7 percent (Lusaka Times, 2021).

In response to increased competition from mobile money network providers, commercial banks have altered their business strategy by delivering more digital banking services to meet market demand such as agency banking delivered through mobile banking platforms, internet or online banking, and electronic card banking solutions with a view to have increased outreach in this regard. However, it is unclear how these advancements by commercial banks have influenced their business performance in terms of profitability, effectiveness, and efficiency during and post the COVID-19 pandemic while facing increased competition in the financial services sector.

As a result, it is critical that research be conducted to assess the impact of digital banking channels on the performance of Zambian commercial banks.

This research is structured as follows: first, the theoretical framework that led the research will be described in Section 2, followed by a review of the empirical literature in Section 3. Following that, the study's methodology will be discussed in Section 4. Then Section 5 will show the study's subsequent results, as well as a discussion of those results, will be presented. Finally, the study's conclusions and recommendations will be detailed in Section 6.

2. Theoretical Framework

Numerous research models and theories have been used in conjunction with a vast amount of study on the use of technology in banking to understand the elements that influence its adoption and utilization. The technology acceptance model (TAM), the Diffusion of Innovation theory, the financial intermediation Theory, the Theory of information production and Banking Theory, and others are significant models that are pertinent to this topic.

The characteristics of technology adopters that embrace innovative technology are examined by the Diffusion of Innovation Theory (Rogers, 1995). The theory examines how individuals within a social group decide to adopt new, creative ideas. Diffusion is the process by which an idea gradually gains acceptance within a social system. According to (Daka and Phiri, 2019), electronic channels are a substitute for traditional banking. This idea supports the cognitive processes that people go through to become aware of the innovation and finally start using the innovation in the context of technological acceptance.

The four key components of every innovation-the innovation itself, the communication channel, the social system, and time are highlighted by the diffusion of innovation theory (Wani & Ali, 2015). Rogers (1995) continues by pointing out that while each person's decision making is unique, it is likely that others in the social system will be impacted. "WhatsApp", a well-known social networking program that enables users worldwide to keep in touch through texting, video conferencing is an example of a practical invention.

Conceptual Framework

See **Figure 1**.

3. Empirical Review of Literature

Banks have made large investments in technology over the past few decades to cut costs and enhance customer service. With the hope of boosting profitability and lowering operating costs, banks are providing clients with the highest quality services through digital channels (Muparadzi & Rodze, 2021). The costs of the bank are projected to decrease as a sizable portion of consumers switch to modern banking channels (Howcroft et al., 2002). But because banks are still having trouble converting customers to using digital banking channels, the anticipated decrease in operating costs has not yet been attained (Kaur et al., 2021).

Lishomwa & Phiri (2020) postulated that although the digital banking system has many benefits for users, some corporate clients still lack confidence in it. It

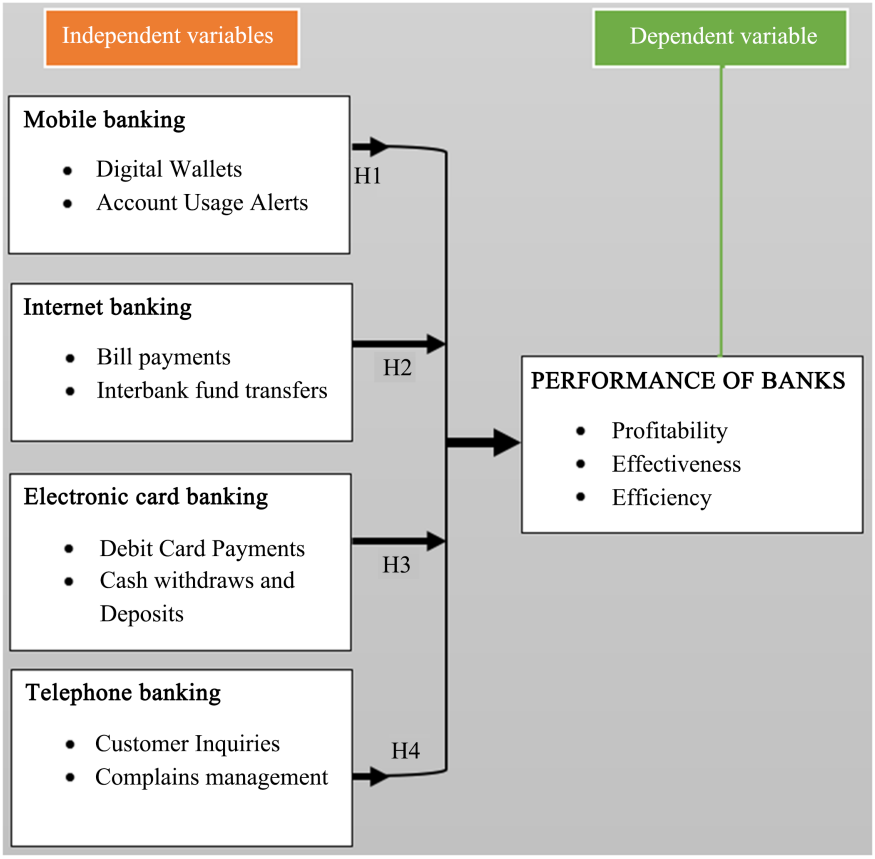

Figure 1. Digital banking channels (Source: Olindo & Musiega, 2018).

becomes incredibly impersonal when there is no face-to-face engagement. Customers feel better at ease interacting with people in a real bank location that offers individualized services rather than technology. Many clients still have little faith in online service, particularly when it comes to payments. The goal of the study was to pinpoint the barriers preventing the corporate clients of FNB Industrial Branch from utilizing internet banking. Using closed ended questionnaires, the data was gathered. After reliability research, it was shown that performance expectancy, control factors, social impact, and behavioral intention were the main variables affecting internet banking usage. The researcher noted a limitation in the study in that the effect that performance expectancy, control factors, social factors and behavioral intention had on internet banking was not known especially that it does not go further validate whether the effect is positive or negative. The research could benefit from going further to evaluate how the branch performance is affected by the factors that are affecting the usage of internet banking channel.

Another study conducted by (Iluba & Phiri, 2021) analysed the influences on traditional banking in Zambia and the factors influencing the introduction of FinTech financial services. The study's goals were to assess the elements that affect the uptake of FinTech financial services and to create plans that can assist

banks stay competitive and relevant. The study used self-administered questionnaires to gather data using a quantitative research approach. The findings indicate a substantial positive connection between compatibility and adoption of 0.621. The study suggests a modified model that depicts variables influencing the adoption of an innovation that could benefit banks. The researcher also notes that the study did not clarify which digital banking components would be influenced by the financial technology despite identifying the factors that would influence the traditional banking system in Zambia.

Savanhu & Zhang (2020) conducted research on the impact of Digital Economy on Zambia's Banking Sector. The study's foundation was data acquired from 10 Zambian commercial banks. This is accomplished through tracking client happiness and financial performance of the bank. When the connection between the variables was measured using the spearman's correlation coefficient, it was found that there was a substantial negative correlation between customer happiness and the quality of the e-banking services. The second investigation measured Zanaco's financial performance using a regression analysis model. The purpose of this study was to evaluate how the bank's financial performance has been impacted by e-banking services. In order to assess financial performance, the independent factors (ATM transactions, mobile banking, and internet banking) were compared to return on assets (ROA). The findings showed that there was no connection of any significance between financial performance and e-banking services. The research however does not mention the usage of e-banking and would benefit from a review of the usage rate at the point of measurement as it contributes significantly to the performance of the digital channel.

Research was done on the impact of digital banking on Pakistani banks' profitability. The study's qualitative nature involved analyzing qualitative standards to gauge the effect of digital banking. Additionally, it looked at how customer literacy affects service delivery from the perspective of banks. Twelve Pakistani banks in three cities participated in the study. The results showed that digital banking has improved bank profitability by enabling them to cover costs and turn a profit even quickly. Illiteracy among customers is not seen as a significant barrier to the development of their goods and services. Digital banking is used by banks primarily to increase client retention and age of clientele. This study however did not clarify which specific channels contributed to the reduction in costs.

The move to digital banking has enhanced bank profitability. Comparable qualitative research must be conducted in Kenya to determine whether similar conclusions can be drawn. The effect of digital banking services on Jordanian bank profits was assessed by (Siam, 2006). He investigated the drivers behind providing online digital banking services, as well as their impact on overall banking services and bank profitability. The researcher run a regression on bank performance, accounting data was used. Due to the costs and investments made by banks to set up technological and electronic infrastructure and to train em-

ployees to be skilled and competent, he discovered that the influence of digital banking services on bank profitability is negative in the short term but positive in the long run. This study unveils a critical component that explains how the benefits outweigh the costs incurred, it however does not clarify the awareness and usage of the platforms at the time of the research.

The impact of internet banking on Turkish bank profitability was examined by (Onay et al., 2008). 13 Turkish banks that implemented online banking between 1996 and 2005 were included in the study. To account for systemic bank crises that occurred in the nation during the period, they looked at the impact of internet banking on return on assets (ROA) and equity (ROE), the interest spread, overhead costs, and commission and fee income. They did this by using bank-specific and macroeconomic control variables. To demonstrate how use of internet banking has evolved over time, the study included time-lag indicators. The conclusions were supported by the results, which showed that with a two-year lag, internet banking starts to boost banks' ROE, but the one-year lag dummy had a negative effect. The results suggested that investing in e-banking is a delayed process.

The impact of internet banking on the efficiency and risk of Indian banks was examined by (Malhotra & Singh, 2009). 85 commercial banks were included in the research from 1998 to 2006, representing about 39% of all scheduled commercial banks in India. Approximately 57% of commercial banks in India offer transactional Internet banking services, according to the results of a survey of 85 scheduled commercial bank websites. The univariate analysis found that compared to banks that do not offer internet banking, online banks are larger organizations with superior operating efficiency ratios and profitability. Compared to non-Internet banks, Internet banks place a greater emphasis on core deposits as a source of funding. The results of the multiple regression analysis indicate that there is no significant relationship between the profitability and availability of online banking, but that there is a strong and unfavorable correlation between internet banking and the risk profile of the banks. It's critical to broaden the study's scope to include other forms of electronic banking since it solely examined internet banking which presents a limitation as more dynamic digital banking channels are presented on the market especially after the effects of the COVID-19.

4. Methodology

According to Creswel (2013), a research design is the overarching method used to integrate the various research components into a logical flow, ensuring the study topic is successfully addressed. The researcher employed a quantitative strategy since it involved elucidating phenomena by acquiring numerical data that was afterwards subjected to mathematical analysis. If the researcher wants to understand the nature of the link between these variables in addition to evaluating whether such a relationship exists, quantitative research is particularly

well suited for testing hypotheses.

All workers of First National Bank (FNB) in Lusaka were the study's targeted population. This information was supplied as of the end of December 2022, and a total of 464 employees out of 683 were included in the population. The sample size for the study was determined using the Cochran Formula, which enables you to do so given a desired level of precision, confidence, and the predicted proportion of the attribute present in the population. Cochran (1963) provides an algebraic method to determine a sample size that is representative of the entire population when the given population is too huge to take into account.

Using a purposive sampling technique, the value judgement in selecting elements or people to be incorporated in the study will be used. The sampling frame then comprised individuals who are employees of First National Bank Zambia. The sample size was arrived at using a statistical formula.

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

where:

- n is the Cochran's sample size recommendation
- N is the population size
- n_0 is the new proportion of the population

Sample Size: 464/(1 + (463/683)) = 276

In this study, a questionnaire was used as the data gathering tool. A questionnaire, according to (Bryman & Bell, 2011), is a document comprising a list of questions written or printed in a certain sequence or set of forms. A quantitative research design was used in the study and data was collected from a sample of 279 respondents with the aid of purposive sampling technique to arrive at a sample size that incorporated only those that served the purpose of the study.

A structured questionnaire was administered through Google forms and sent to selected respondents through email and WhatsApp platforms. The Statistical Package for Social Sciences (SPSS) version 23 was used to code and analyze the main data obtained from the questionnaire. This version of SPSS employed both descriptive statistics and inferential statistics from IBM SPSS Statistics. A five-point Likert scale with Strongly Agree at 5, Agree at 4, Neutral at 3, Disagree with (D), and Strongly Disagree at 1 was used to gather responses from the sample population for this study.

5. Results and Discussion

This part presents the study's research findings from the descriptive, correlation, and regression tests that were performed, followed by a discussion of the findings.

5.1. Response Rate

The questionnaire was administered using the internet to employees of First Na-

tional Bank Zambia. The questionnaire was administered in form of an online survey through Google forms for online collection of data. A total of 350 questionnaires were sent out and 279 responses were collected back presenting a response rate of 79.7% which is a good enough response for the study considering the difficulties encountered with getting responses through Google forms platforms.

5.2. Gender and Age Crosstabulation

Table 1 displays the crosstabulation of Gender and Age of respondents. From the total 279 responses received, the survey results showed that 50.9% were male and 49.1% were female while 2 responses did not indicate the gender accounting for 0.6% of the responses. From the analysis it was revealed that 182 respondents were aged between 18 and 35 of which 80 were male and 102 females this accounted for 28.9% and 36.8% respectively of the total collected data in this age group. It also showed that 92 respondents were between the age of 36 - 55 years of which 58 were male and 34 were female accounting for 20.9% and 12.3% respectively. Finally, 3 showed that they are above 56 years old of which 3 were males and no females representing 1.1% of the total data collected in this age group.

5.3. Testing Reliability

Internal consistency among questions for each dimension and overall consistency across all questionnaire items were assessed using Cronbach's Alpha. Reliability Internal dependability of scales is crucial for assessment. It calls into question whether scales are measuring a single concept, and thus, if the scale's constituent parts are internally consistent. Table 2 displays the Cronbach's Alpha results as it was utilized in this investigation to determine dependability. The intended composite dependability value is 0.70 as the minimum.

Table 1. Gender and age of respondents.

			Gender and Age Crosstabulation		Total
			Male	Female	
What is your Age?	18 - 35	Count	80	102	182
		% Of Total	28.9%	36.8%	65.7%
	36 - 55	Count	58	34	92
		% Of Total	20.9%	12.3%	33.2%
	56+	Count	3	0	3
		% Of Total	1.1%	0.0%	1.1%
Total		Count	141	136	277
		% Of Total	50.9%	49.1%	100.0%

Reliability Statistics

All the variables dependent and independent were deemed trustworthy based on the Cronbach's Alpha values since their respective Cronbach's Alpha Coefficients were all above 0.70. Table 3 shows the overall findings that demonstrate that the questionnaire was a trustworthy instrument. The calculated Cronbach's Alpha scores for each of the five constructions are displayed in Table 2 below.

5.4. Test for Normality

A normality test was conducted on the data used in the research and Table 4 below shows the results on the two tests for normality, namely the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. The Shapiro-Wilk test is a statistical test used to check if a continuous variable follows a normal distribution and this was used to interpret the results. The test for normality determines whether the data is normally distributed if the significant value is greater than 0.05. From the above, the significant value for the Shapiro-Wilk normality test is 0.827 which is greater 0.05 implying that the data is normally distributed. Figure 2 shows that the data is normally distributed as all data points are close to the diagonal line.

Table 2. Cronbach's alpha reliability statistics.

Cronbach's Alpha per Construct		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.902	0.903	5

Table 3. Reliability statistics.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Mobile Banking	17.1297	4.960	0.575	0.418	0.910
Internet Banking	17.4752	3.528	0.896	0.872	0.843
Electronic Card Banking	17.0618	4.618	0.749	0.644	0.878
Telephone Banking	17.3167	3.928	0.844	0.855	0.854
Performance	17.2180	4.719	0.731	0.591	0.882

Table 4. Normality tests.

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Performance	0.137	6	0.200	0.931	6	0.827

a. Lilliefors significance correction.

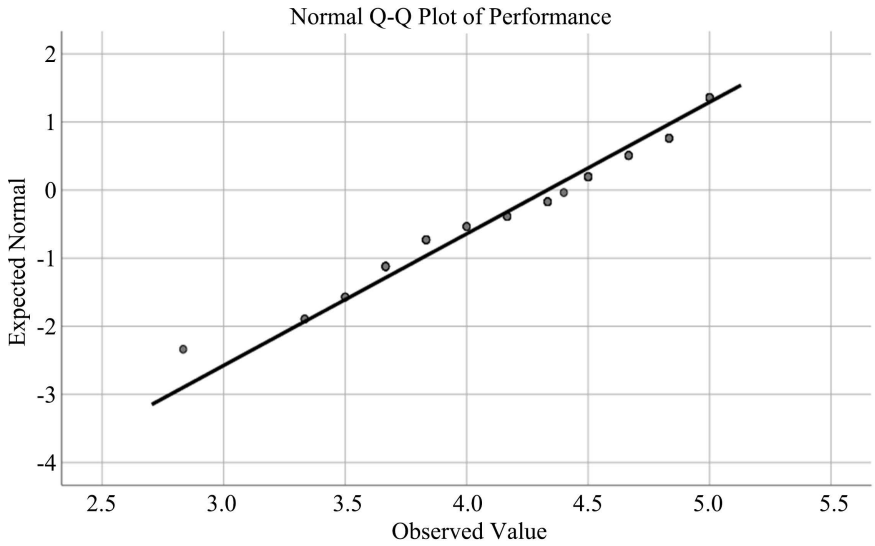

Figure 2. Normal Q-Q plot of performance.

5.5. Correlation Analysis

The relationship between constructs of this study was determined by Pearson correlation. Correlation values above 0.70 show a very strong positive correlation, those between 0.5 and 0.70 indicates strong correlation, 0.3 to 0.5 shows moderate correlation and lastly those between 0.1 and 0.3 indicate relatively weak correlation. Pallant (2010) eluded that any correlation above 0.80 may cause worry as it indicates the presence of multicollinearity. Below is the table of Pearson correlation for this study.

Table 5 shows that the results of Pearson correlations between independent variables and the dependent variable financial performance show that all variables were significantly correlated ($p < 0.01$ and at $p < 0.05$). All the correlation values were positive, indicating positive relationships among all variables. The strongest positive correlation value (r) was 0.695, which was the correlation between Internet banking and financial performance which entails that there is positive relationship between Internet Banking and Financial Performance of commercial banks, while the least was mobile banking with a correlation value (r) of 0.461 and this entails evidence that there is a moderate relationship between Mobile banking and financial performance.

5.6. Regression Analysis

Regression analysis is a form of inferential statistics and to achieve the objective of the study, a multiple regression model was used to help assess the results and draw up conclusions on the assumptions or hypothesis of the study. The regression model was used to enable the researcher to assess the effect between a dependent (predicted) variable and several independent (predictor) variables. The result of multiple regression is the development of a regression equation line of best fit between the dependent variable and several independent variables.

Table 5. Correlation results for digital banking channels and financial performance.

		Mobile_ Banking	Internet Banking	Electronic card banking	Telephone_ Banking	Performance
Mobile Banking	Pearson Correlation	1	0.613**	0.538**	0.532**	0.461**
	Sig. (1-tailed)		0.000	0.000	0.000	0.000
Internet_Banking	Pearson Correlation	0.613**	1	0.696**	0.879**	0.695**
	Sig. (1-tailed)	0.000		0.000	0.000	0.000
Electronic card banking	Pearson Correlation	0.538**	0.696**	1	0.811**	0.632**
	Sig. (1-tailed)	0.000	0.000		0.000	0.000
Telephone Banking	Pearson Correlation	0.532**	0.879**	0.811**	1	0.643**
	Sig. (1-tailed)	0.000	0.000	0.000		0.000
Performance	Pearson Correlation	0.461**	0.695**	0.632**	0.643**	1
	Sig. (1-tailed)	0.000	0.000	0.000	0.000	

**. Correlation is significant at the 0.01 level (1-tailed).

Table 6 shows the regression model summary for the predictors Mobile Banking, Internet Banking, Electronic Card Banking and Telephone banking with Financial Performance to help determine the effect that the predictors have on the outcome variable by assessing the variations in R^2 that can be traced back to the predictors. Based on the results of the ANOVA **Table 7**, the model shows that it is highly significant hence we can proceed to assess the effect because the *p*-value of F ratio 77.107 is <0.05 (*p*-value = 0.000). This shows that performance of commercial banks is significantly affected, and the proportionate variations can be predicted from the independent variable.

Table 8 shows that both Internet Banking and electronic card banking is highly significant because *p*-value = 0.000 < 0.005 confidence interval set meaning that 0.591 indicating that approximately 59.1% of the variance of the business performance can be accounted for by the linear combination of internet banking and Electronic Banking. The regression equation for predicting business success is:

$$Y = 1.681 + 0.434 \times \text{internet Banking} + 0.323 \times \text{Electronic Card Banking}$$

The model illustrates that when all variables are held at zero (constant), the other factors contributing to financial performance would be 1.681. However, holding other factors constant, a unit increase in internet banking, would lead to a 0.434 increase in financial performance and unit increase in electronic card banking would lead to 0.323 increase in financial performance of commercial banks. Therefore, the analysis above shows that the null hypothesis is rejected in favor of the alternative as there is not much or sufficient evidence to support it.

Table 6. Regression results.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Model Summary Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.769a	0.591	0.574	0.33770	0.591	35.011	4	97	0.000

Predictors: (Constant), telephone banking, mobile banking, electronic card banking, Internet banking. Dependent variable: Performance.

Table 7. ANOVA results.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.524	4	12.381	77.107	0.000b
	Residual	43.835	273	0.161		
	Total	93.359	277			

a. Dependent variable: Performance. b. Predictors: (Constant), Telephone banking, Mobile banking, ElectroCard_Banking, Internet banking.

Table 8. Coefficients values for independent variables.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.681	0.182		9.256	0.000
	Mobile Banking	−0.010	0.046	−0.011	−0.211	0.833
	Internet Banking	0.434	0.068	0.608	6.420	0.000
	Electro Card Banking	0.323	0.066	0.358	4.878	0.000
	Telephone Banking	−0.135	0.084	−0.176	−1.617	0.107

Dependent Variable: Performance.

6. Conclusion and Recommendations

After the study on the impact of digital banking channels on the performance of commercial banks in Zambia was completed, recommendations were made based on the findings to highlight specific factors that commercial banks can use to influence how their banking platforms are used, improve operational efficiency, and maintain a competitive edge in the overall financial system. This study's goal was to ascertain how Zambia's commercial banks performed in relation to their use of digital banking channels. The following research questions served as the study's guiding principles.

- What effect do digital banking channels have on the performance of commercial banks?

- What key factors of digital banking contribute to the performance of commercial banks?

In this study, a quantitative research design was used. 464 first national bank of Zambia workers made up the study's population. Over 350 structured questionnaires were distributed as the data collecting tool in this study to acquire a minimum sample size of 279 participants. In this study, data were analyzed using descriptive and inferential statistics to examine the connection between the dependent variable and the independent factors. The mean and standard deviations were utilized in the descriptive statistical analysis, while the Pearson Correlation Test and Regression Test were employed in the inferential statistical analysis.

The study found that the performance of commercial banks in Zambia is impacted by a combination of the mobile banking, internet banking, electronic card banking, and telephone banking models. The study also showed that the model's modified R squared value was 0.574, indicating that the study's emphasized digital banking channels account for around 57.4% of the performance of commercial banks in Zambia. Variables outside the scope of this study can account for the remaining 42.6%.

It is advised that commercial banks work to improve the interface of the internet banking channel and go one step further to include the delivery and utilization of Personal Financial Management (PFM) tools that would enhance the overall experience of customers beyond excellent graphic representations of financial tools and account positions. This recommendation is based on the feedback from the study. Account aggregation, cutting-edge data analytics, and enhanced recommendation and application engines can work together to provide a value-added service that is both beneficial and user-friendly.

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Conflicts of Interest

Regarding the publishing of this paper, the authors declare that they have no conflicts of interest.

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