DIGITAL FINANCIAL INNOVATION SERVICES AND THEIR IMPACT ON THE PERFORMANCE OF COMMERCIAL BANKS IN KENYA

Virginia Kirigo Wachira[1i],
Fredrick Kalui[2],
John Gathii[3]
[1]Meru University of Science and Technology,
Kenya
[2]Prof., Egerton University,
Kenya
[3]Dr., Kabarak University,
Kenya

Abstract:
The study aimed at investigating the impact of digital financial services on the financial performance of Commercial Banks in Kenya using secondary dataset generated from the Central Bank of Kenya (CBK) and the Communication Authority of Kenya (CAK) for a period of five years (2015-2019). To achieve this objective, the study used a multiple regression and Pearson correlations. The study using the Pearson correlations found negative correlations between mobile money (registered mobile money accounts, active mobile money agents and mobile money deposits and withdrawals), digital payments (P2P transfers) and performance of commercial banks. However, the study found positive and significant relationship between customer deposits, Gross non-performing loans and performance of commercial banks in Kenya. The study therefore concludes that digital financial services offered by Fintech companies have a negative impact on the performance of Commercial banks in Kenya and recommends that commercial banks should continuously develop more digital financial services and collaborate more with Fintech companies to improve on their performance. The originality of this study will be of benefit to managers of Commercial banks.

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[i] Correspondence: email vkwachira2012@gmail.com

1. Introduction

Currently, the world is digitizing due to advancement of technology. Digitalization through technology can be termed a catalyst to the growth and competitiveness in the financial sector. Hence, posing a challenge to traditional financial institutions particularly banks (Gerlach & Lutz, 2021). Due to the growth and development of technology, the financial sector has radically changed the provision and access of financial services leading to easy access of financial services. The financial sector is gradually innovating and transiting to the digital age from fiat currency to digital currency, brick and mortar banking to online and mobile banking, digital payment services and e-finance. These continuous innovations are gradually transforming the financial sector (Palmié et al., 2020). Digital transformation of financial institutions is greatly attributed to the new digital drifts consequently leading to substantial developments to the financial systems (Khan et al., 2021), changes in customer behavior and preferences (Beloke et al., 2021 and Khanboubi et al., 2019) and increased demand of digital financial services (Abbasi & Weigand, 2017). Customers particularly in the current generation are seeking for cheaper, flexible and easy to use financial services. Subsequently, this is challenging the traditional financial institutions as they bid to reach and satisfy their young and more technologically inclined customer base (Koch & Siering, 2017). Moreover, the increasing demand of digital financial services encourages the traditional financial institutions and non-financial institutions to offer diverse financial products, retain their existing customers and penetrate into the unbanked population (Abbasi & Weigand, 2017).

Digital financial services increase the provision of financial services offered by traditional financial institutions through advanced and innovative technologies such as mobile money, mobile banking, internet banking and digital payment platforms (Abbasi & Weigand, 2017). According to Pazarbasioglu et al., (2020), digital financial services are the "*financial services that are dependent on digital technologies for delivery and use by customers*". Digital financial services in developing countries enables individuals with limited access to financial services to access these services using their mobile phones at their convenience and without physically going to the physical bank. According to ADB, (2016), digital financial services not only enable money transfers but also enables safe storage of money electronically (mobile money), payment services, savings and opportunity to a wider access of other financial services such as insurance and credit facilities.

Digital financial services are beneficial in Kenya since the country has a large population of the unbanked. Digital financial services in Kenya are easily associated with the use of mobile phones to pay for utility bills, transfer or receive money, make purchases, use their mobile accounts to save, deposit or withdraw money, access their mobile banking accounts and make payments for other essential services such as school fees. According to Shaikh et al., (2020), mobile phones are considered an important component in the provision of financial services. Digital financial services accessed through mobile phones are less costly, time saving (McKinsey, 2016). In Kenya, mobile

phones appear as the widely recognized way of accessing financial services. This has forced Commercial banks to collaborate with Fintech companies to provide digital financial services and remain competitive.

Most academic scholars analyze the effect of individual digital financial channels such as mobile banking (Too et al., 2016; Oyomo, 2018) and internet banking (Mateka & Omagwa, 2016; Kombe & Wafula, 2015; Tunay et al., 2015; Dinh et al., 2015) on bank performance. Additionally, most studies have used financial ratios such as Return on Assets (ROA) and Return on Equity (ROE), (Giordani, et al., 2013; Tunay & Tunay, 2015; Siddik et al., 2016; Giudice, et al., 2016, Wadesango & Magaya, 2020) as a measure of financial performance. Little academic attention has been paid on the impact of digital financial services on the performance of banks particularly in Kenya. This study therefore aimed at analyzing the impact of digital financial services on the performance of Commercial Banks in Kenya. The study used Earnings Before Interest and Tax (EBIT) as a measure of financial performance.

2. Definition of Digital Finance and Digital Financial Services

Financial institutions are bending towards technology in a bid to offer the best services through digital platforms. Financial institutions are forced to implement various strategies to remain competitive. Some institutions tend to use technology to improve on their existing business models, processes and customer experience while others tend to radically transform their business models and processes[ii].

There is no standard definition of digital finance from either the academic scholars or industrial researchers. From an industrial point of view, digital finance has been defined as delivering of financial services through a digital infrastructure such as mobile phone or internet with minimal use of traditional banks and cash (McKinsey, 2016). From the academic scholars point of view, Koch & Siering (2017), posits that digital finance includes the provision of new financial products, new and innovative ways of customer interaction and new financial businesses provided by Fintech companies. While, Ozili (2018), defined digital finance as the provision of financial services through channels such as the internet and mobile phones.

Notably, there is a distinction between digital finance and digital financial services. Digital financial services have been broadly defined as "*…….the extensive technologies available to deliver financial services from a broad range of providers to a wide range of recipients using digital remote means*" (ADB, 2016). Additionally, digital financial services have been defined as a "*range of financial services which can be assessed and delivered through digital channels*"[iii] for instance mobile money services, payment services, credit services, savings, and insurance services (Abbasi & Weigand, 2017).

[ii] https://www.avenga.com/magazine/digital-transformation-financial-services/ Accessed on 21st June 2021
[iii] https://www.afi-global.org/thematic-areas/dfs/ Accessed on 18th June 2021

2.1 Concepts of Digital Finance and Digital Financial Services

The main aim of digital financial services is not to introduce the concept of financial management to the people but rather to provide access to affordable, reliable financial services and ways of managing their finances (ADB, 2016). The implementation of digital financial services varies from country to country depending on the level of technology and infrastructure available. In Kenya, the Mobile Network Operators (MNO) model is widely used. According to ADB (2016), the Mobile Network Operators partner with banks to provide digital financial services. They also use their agent networks as the cash-in/Cash out points for mobile money (ADB, 2016).

Mobile phones and the use of the internet enable customers to access banking and other financial services such as payment of utilities and bills, payment of school fees, cash deposits and withdrawals, receiving of wages, savings, sending and receiving of money among others. Therefore, mobile phones and the internet have not only offered effective and faster delivery channels of traditional banking services but also encouraged the provision of new financial products (Abbasi & Weigand 2017). However, mobile phones and use of internet has put pressure on traditional banks. Due to this pressure and competition, banks have developed mobile banking applications which are easy to use and accessible by account and non-account holders (Shaikh et al., 2020).

Digital finance has three main components First; the digital transactional platform which enables customers to receive payments, make payments, transfer money or save money electronically in their bank or non-financial institution using their device. Second, retail agents who offer the cash in/cash out (CICO) services and third; the customer device for instance the customer mobile phones or computers[iv].

3. Digital Financial Services in Kenya

According to Pazarbasioglu et al., (2020), Kenya is in the third stage of the development of digital financial services having moved from just offering payment services to other digital financial services like insurance and credit. The digital financial services include online banking, mobile banking, mobile money transfers and agency banking. These services are made possible by the collaboration of Commercial banks and telecommunication companies. Digital financial services first came into the limelight in 2007 after the launching of the first mobile money transfer platform (MPESA) by Safaricom Ltd. After 2007, Kenya has witnessed a rapid growth and evolution of mobile money services. The business environment later saw the entrance of other telecommunication companies such as Airtel Kenya with Airtel Money, MobiKash and T-Kash by Telkom Kenya into mobile money services. Mobile money services also expanded to integrate payment services and provision of banking services with the collaboration of Commercial Banks in Kenya. For instance, M-Kesho a partnership between Equity Bank and M-Pesa, M-Kesho a partnership between Commercial Bank of

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[iv] https://www.cgap.org/blog/what-digital-financial-inclusion-and-why-does-it-matter Accessed on 21st June 2021

Africa and MPESA, KCB-Mpesa a partnership between Kenya Commercial bank and M-Pesa among others. This gives access of cheaper, faster and convenient financial and banking services to a larger population which was unbanked especially in the rural areas. Moreover, these digital financial services enable customers to pay utilities bills, school fees and shopping.

4. Literature Review

Digital Financial Services has attracted the attention of academic scholars covering a wide range of topics. For instance, Shaikh et al., (2020) examined the key drivers of customer experience with non-financial digital services and revealed that consumer awareness, ease of use and usefulness largely affects the experience and usage of mobile banking applications.

Niemand et al., (2021)' study on digitalization in the financial industry revealed that having a clear vision on digitalization a willingness to take risks and no just a sheer level of digitalization affects the profitability of banks. Additionally, Opiyo (2021) explored the effect digital financial services on financial performance using descriptive and correlation analysis found a strong and significant positive correlation between mobile financial services and financial performance while online financial services had a moderate and significant positive correlation between mobile financial services and financial performance.

Beloke et al., (2021) analyzed the influence of digital financial services on the financial performance of banks in Cameroon. The study used the Taylor linearise variance estimation method. The study revealed that digital withdrawals, digital saving services and digital transfer services had a positive and significant influence on the profitability of banks. Interestingly, the study found a negative but significant influence of digital payments and the profitability of banks.

Wadesango & Magaya (2020) analyzed the impact of digital banking services on performance of Commercial banks in Zimbabwe. The study used multiple regression model and performance was measured using the Return on Assets (ROA) ratio. The study revealed that there was a positive relationship between Return on Assets and digital banking. An increase in online customer deposits and online banking transactions led to an increase in the Return on Assets. However, the study also found a negative relationship between Return on Assets, internet banking fees and commissions and expenditure on internet banking.

Too et al. (2016) and Oyomo (2018) studies revealed a significant relationship between mobile banking and the performance of Commercial banks. While Mateka & Omagwa (2016), study revealed a positive influence of internet banking on bank incomes, operating costs, loan book and customer deposits. Tunay et al., (2015) found a strong relationship between internet banking and performance of banks in the Euro area countries and Dinh et al., (2015) study revealed that internet banking had an impact on the profitability of banks. However, Giordani, et al., (2013) found that using the internet

as a delivery channel of financial services has no effect on the profitability of banks in terms of Return on Assets (ROA) and Return on Equity (ROE). The study concluded that the adoption internet banking has not impact on net loans over assets, assets and equities over total assets.

Takon et al., (2019) analyzed the impact of digital payments system of the efficiency of banks in Nigeria. The study revealed that digital payments (Point-of sale, ATM transactions, mobile payment and web payment) had a negative and significant impact of the efficiency of banks. Boateng & Nagaraju (2020) study investigated the impact of digital banking on the profitability of deposit money banks in Ghana. The study there was a positive relationship between Ghana automated clearing house, Ghana interbank settlement, GH-Link and the profitability of Banks. However, the study also found a negative relationship between mobile money, E-zwich and the profitability of banks

5. Research Methodology

The study investigated the impact of digital financial services on the performance of Commercial Banks in Kenya using the dataset generated from the Central Bank of Kenya (CBK) and the Communication Authority of Kenya (CAK) for a period of five years (2015-2019). The study used a multiple regression model to establish the relationship between the dependent variable (EBIT) and the independent variables (P2P transfers, Gross non-performing loans, total customer deposits in the bank, total registered mobile money accounts, Total cash in/cash out and total active agents).

5.1 Model Specification
The study used the following multiple regression model.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Where;
Y = EBIT
β_0 = Constant
X_1 = P2P transfers
X_2 = Gross non-performing loans
X_3 = total customer deposits in the bank
X_4 = total registered mobile money accounts
X_5 = Total cash in/cash out
X_6 = total active agents
e = error
$\beta_1, \beta_2, \beta_3$ = parameters used

5.2 Variable Definition

	Measure
Dependent Variable	
EBIT	Earnings Before Interest and Tax
Independent Variables	
P2P Transfers	Amount of money transferred to individuals electronically
Gross Non Performing Loans	Amount of money due and unpaid for a period of 90 days or more
Total customer deposits in the bank	Amount of value deposited to the bank in cash
Total registered mobile money accounts	Number of registered mobile money accounts
Total cash in/cash out	Total value deposited or withdrawn through agents
Total active agents	Number of active mobile money agents

5.3 Data Analysis and Discussion
5.3.1 Regression Analysis

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.914[a]	.836	.817	3398.91010	2.045
a. Predictors: (Constant), P2P payment transfers, gross non-performing loans (millions), Total Registered Mobile Money Accounts (Millions), customer deposits (millions), Total Agent Cash in Cash Out (Value KSh billions) deposits and withdraw, Active Agents					
b. Dependent Variable: EBIT (millions)					

The R^2 is 0.836 (83.6%) while the Adjusted R^2 was 0.817 (81.7%). This indicates 81.7% variation in the performance of the bank (EBIT) can be explained by the model. The adjusted R^2 accounted for 0.817 (81.7%) is slightly lower than the R^2 value which indicates the precise relationship between the independent and the dependent variable due to its sensitivity of addition of any irrelevant variables. The predictors in our model were statistically significant with a p-value < .000.

5.3.2 ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3111381630.973	6	518563605.162	44.887	.000[b]
	Residual	612287264.123	53	11552589.889		
	Total	3723668895.095	59			
a. Dependent Variable: EBIT (millions)						
b. Predictors: (Constant), P2P payment transfers, gross non-performing loans (millions), Total Registered Mobile Money Accounts (Millions), customer deposits (millions), Total Agent Cash in Cash Out (Value KSh billions) deposits and withdraw, Active Agents						

The study found a statistically significant regression equation (F (6,53) = 44.887, $p<0.000$ with an adjusted R^2 of 0.817. The Regression model was hence considered a good fit for our data as it statistically and significantly predicts the outcome.

The study further conducted a Pearson correlation analysis to test the relationship between our dependent variable (EBIT) and our independent variables (P2P transfers, Gross non-performing loans, total customer deposits in the bank, total registered mobile money accounts, Total cash in/cash out and total active agents).

From the Pearson correlation analysis, the study found a negative but weak correlation between registered mobile money accounts and the performance of Commercial banks ($r=-.138$, $p= 0.292>0.001$), a strong negative correlation between Active agents and the performance of Commercial banks ($r=-.096$, $p=0.466>0.001$), a negative but weak correlation between P2P payment transfers and the performance of Commercial banks ($r=-.245$ $p=0.060>0.001$), a negative but weak correlation between cash in cash out and the performance of Commercial banks ($r=-.129$, $p=0.325>0.001$). Interestingly, the study found a strong correlation between bank customer deposits and the performance of Commercial banks ($r=0.886$, $p<0.001$) and Gross non-performing loans and performance of Commercial banks ($r=0.647$, $p<0.001$).

Table 2: Pearson Correlation Matrix

Correlations		EBIT (millions)	Total Registered Mobile Money Accounts (millions)	Active Agents	P2P Payment Transfers	Total Agent Cash in Cash Out (Value KSh billions) Deposits and Withdraw	Customer Deposits (millions)	Gross Non-performing Loans (millions)
EBIT (millions)	Pearson Correlation	1	-.138	-.096	-.245	-.129	.886**	.647**
	Sig. (2-tailed)		.292	.466	.060	.325	.000	.000
	N	60	60	60	60	60	60	60
Total Registered Mobile Money Accounts (millions)	Pearson Correlation	-.138	1	.959**	.164	.918**	.024	.247
	Sig. (2-tailed)	.292		.000	.211	.000	.853	.057
	N	60	60	60	60	60	60	60
Active Agents	Pearson Correlation	-.096	.959**	1	.120	.943**	.073	.306*
	Sig. (2-tailed)	.466	.000		.359	.000	.578	.018
	N	60	60	60	60	60	60	60
P2P Payment Transfers	Pearson Correlation	-.245	.164	.120	1	.128	-.138	-.057
	Sig. (2-tailed)	.060	.211	.359		.329	.292	.667
	N	60	60	60	60	60	60	60
Total Agent Cash in Cash Out (Value KSh billions) Deposits and Withdraw	Pearson Correlation	-.129	.918**	.943**	.128	1	.064	.329*
	Sig. (2-tailed)	.325	.000	.000	.329		.625	.010
	N	60	60	60	60	60	60	60
Customer Deposits (millions)	Pearson Correlation	.886**	.024	.073	-.138	.064	1	.829**
	Sig. (2-tailed)	.000	.853	.578	.292	.625		.000
	N	60	60	60	60	60	60	60
Gross Non-performing Loans (millions)	Pearson Correlation	.647**	.247	.306*	-.057	.329*	.829**	1
	Sig. (2-tailed)	.000	.057	.018	.667	.010	.000	
	N	60	60	60	60	60	60	60
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

6. Conclusion and Recommendation

The study provides more insights into the impact of digital financial services on the performance of banks particularly in developing countries. We investigated the impact of digital financial services on the performance of Commercial banks in Kenya. The study found out the mobile money proxied by mobile money accounts, active mobile money agents and mobile money cash deposits and withdraws had a negative relationship with the performance of Commercial Banks. Additionally, the study found that digital payments proxied by P2P transfers also had a negative relationship with the performance of Commercial Banks. This can be explained by the fact as more people use the digital financial services, it leads to a reduction in the commission earned by the banks while providing such a service. The study therefore concludes that digital financial services offered by Fintech companies have a negative impact on the performance of Commercial banks in Kenya. However, there was a positive and significant relationship between customer deposits, Gross non-performing loans and performance of Commercial Banks. The study therefore recommends that commercial banks should continuously develop more digital financial services and collaborate more with Fintech companies to improve on their performance in terms of profit. Further research can also be conducted on the impact of digital financial services on the performance of other financial institutions in Kenya such as Microfinance Institutions (MFIs) and Savings and Credit Cooperatives (SACCOs) for comparative analysis.

Conflict of Interest Statement
The authors declare no conflicts of interests.

About the Authors
Virginia Kirigo Wachira holds a bachelor's degree in Accounting and Economics from Nairobi University (Kenya), master's in business administration-Finance Option from Kenyatta University (Kenya) and has currently completed her Ph.D. Business Administration-Finance Option from Kabarak University (Kenya) awaiting graduation. She has a vast experience in lecturing Institutions of Higher learning and Universities in Kenya. Her main areas of interest are Financial Statement Analysis, Money and Banking, Financial Innovations, Fintech and Financial Accounting among others.
Prof. Fredrick Kalui holds a PhD in Accounting & Finance, The Open University of Tanzania and a master's in business administration (Finance), University of Nairobi (Kenya). His main areas of interest are Accounting and Finance.
Dr. John Gathii holds a PhD in Accounting, Kabarak University and a master's in business administration (Accounting) – Egerton University (Kenya). His main areas of interest are Financial Performance, Forensics Accounting and Investigations, Measures of Business Performance.

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