

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

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Abstract: This study examined the effect of digitization on banks profitability in selected commercial banks in Nigeria. The study was precipitated to by the various digital self-service channels by banks for customers' adoption and other similar works done on the customer service satisfaction of digitization. This work reviewed the digital income earned by four major banks in Nigeria relying on secondary data collected from available information on the banks annual financial result, as presented on the floor of the Nigeria stock exchange, covering a period of 13years from 2006 to 2018. The specific objective of the study is to examine the effect of income earned via the digital channels on the total profit after tax (PAT) of the various banks, and if it has any significant effect on the return on equity. The work adopted the regression analysis model to review and analyzed the effect of digital income to the overall profit after tax of the banks selected out of the 22 commercial banks in the country. The research found out by review of each bank's analyzed result that in all the banks under review, there was significant effect of digitization on the banks total profit after tax. It however showed that there is no significant effect of digitization on the return on equity of the commercial banks and recommend that banks should ensure their channels uptime is high to increase income.

Keywords: Digitization, Self-Service Channels, Bank Profitability, Technology, Digital Banking

1. INTRODUCTION

1.0 Background of the study

This work studied the effect of digitization on profitability of selected commercial banks in Nigeria. Commercial banks in Nigeria have continued to roll out digital technology products and their customers have been inducted with requests to switch over to such digital banking services. The channels rolled out by banks includes mobile apps, USSD, POS, MPOS, Mobile-wallets, QR codes payments, Virtual banks, BNAs etc. According to Oyewole, Abba, Gambo and Arikpo (2013), explosive growth in ICTs have removed the narrowed digital divide and turned business sphere into an electronic world. Besides the high cost of transactions and epileptic network connections associated with e-banking system in Nigeria, the introduction of e-banking into banking operations brought an increase both in the volume of deposits, as well as fraudulent practices (Agwu & Carter, 2014).

The evolving eco-system of payment in the country is proffering massive dynamics in the e-commerce industry enabling customers to pay for goods and services, receive money transfers as well as providing retailers with efficient and ease to integrate tools for accepting online, offline and NFC Payments (Apochi, 2017). Today, Nigeria banking industry has been characterized by the deployment of ATMs, internet, phones and Point of Sale (POS), as electronic payment tools (Okoro, 2014). This transition to electronic banking has several benefits and advantages. Chemtai (2016) opines that electronic banking offers major opportunities in terms of competitive advantage especially in the area of customer confidence and retention. Banks are instrumental not only in extending credit to finance or consumption and investment projects, but are also the conduit through which monetary policies are conducted, and serve as the payment mechanism through which transactions are consummated. Innovations and investments in high tech IT applications and business models have no doubt improved banking service greatly and also provided for efficiency and safety in payment systems through innovative payment solutions such as web pay channels, Point of sale terminals, ATM etc. Babatunde and Salawudeen (2017) opines that Nigerian banks have no doubt invested much on technology; and have widely adopted electronic and telecommunication networks for delivering a wide range of value added products and services. Digitalization represents a change in perspective that unavoidably influences the most traditional organizations and even affects the general society (Gimpel & Röglinger, 2015). It is important to state that digitalization has overturned large industries, retail businesses, media, transport etc. and this is currently sweeping across commercial banks in Nigeria. The digitalization change has been around for a considerable length of time; but in recent times, its effect and the speed of change appear to be exceptional.

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Digitalization has changed the financial sector and its working condition. Albeit, it is important to say that financial services have been automated for quite a long time, but a more extreme change could be said to be delayed as a result of most financial organization trying to maintain their traditional financial mode of services (IFC, 2017).

As a result of the technological advances and digitalization, the collaboration between commercial banks and customers has likewise been improved and this has made better approaches for transactions. This quick change can be found in the banking sector, where digitalization has given the banks more innovative ways for reaching out to potential clients and in the meantime, this has helped them to enhance their services. Digitalization in the banking sector has brought about Internet banking and mobile banking, which has turned into the single greatest channel right now for reaching customers and for customers to be able to deal with their banking errands themselves (Deutsche Bank, 2016). The impacts of digitalization on Nigerian's financial institutions can undoubtedly be associated to the measure of individuals utilizing the internet banking and mobile banking services to pay their bills, which is the dominating factor on an average person's banking errands. The breakthrough techniques for reaching customers are becoming less expensive and less demanding than the traditional methods (Magatef & Tomalieh, 2015) (Wright, 2017).. Digitalization of the Nigerian commercial bank has brought about new models in businesses, that is new ideas with regards to development and improvement in various areas, from mobile banking to financial transactions and internet banking. This has continued to grow and supplant the conventional banking services to the customers through innovative technologies to meet the developing complex necessities and challenges of globalization. The Nigerian banking and financial sector have experienced radical changes and improvement over the last few years and is in a consistent state of development (Gabor and Brooks, 2016; Abbasi and Weigand, 2017). It is an obvious fact that the performance of an organization is measured by how well its customers are satisfied with products or services that are being offered as a result of their persistent patronage (Khadka and Maharjan, 2017). The Nigerian commercial banks may have digitalized their processes, but there are still several limitations being experienced by customers. Customers are still limited a great deal as they process their daily banking transactions such as still filling physical forms to sort out issues that ought to have been attended to via a digital process. Due to this, one will still find lots of queues within the halls of commercial banks waiting to be attended to. With the effect of the cashless policy in 2017 by the Central Bank of Nigeria (CBN) and other similar policies to encourage digitalization, one will still wonder why this limitation is still lingering as most commercial banks have either adopted or adapted digitalizing their processes making the enormous investments on the required IT infrastructure and digital technologies to be in vain (Nigeria Today, 2017).

1.1 Statement of the problem

Banks are financial institutions set up by investors to take on the business of banking services as regulated by the Central Bank of Nigeria (CBN). As a business entity, the aim of the investors is to make profit in compensation to the financial investments made to set up the banks. Many banks have failed in the past due to liquidity issues occasioned by poor profits and lack of investor's willingness to commit additional funds to shore up their capital adequacy ratios as required by the central bank of Nigeria. This is because no investor wants to put funds into a business that they will not reap good returns.

Also, banks with poor profits or loss making banks also faces threats of mergers and acquisitions by sound banks that are also making profits. In other to make and sustain profits, banks seek various avenues to make income irrespective of how little the incomes are. Besides, several studies have used Return on Assets (ROA), Return on Equity (ROE), Profitability (Njeru & Omagua 2018, Sujud & Hasmen 2017, Abaenewe, Ogbulu & Ndugbu 2013, Kharwish, 2011,) etc as proxy for bank performance with scanty work preferring bank deposit (Ugwueze & Nwezeaku, 2016).

1.2 Objective of the study

In general, this study investigates the effects of digitization on the profitability of commercial banks in Nigeria. The specific objectives are:

- i. To ascertain if digitization has any effect on commercial banks profit after tax.
- ii. To determine how digitization affects the return of on equity of selected commercial banks.

1.3 Research questions

The following questions are raised to guide this study:

- i. How do you ascertain the effect of digitization on the profit after tax of selected commercial banks?
- ii. What is the effect of digitization on return of equity of commercial banks?

1.4 Research Hypotheses

Ho₁: Digitization has no significant effect on profit after tax of selected Commercial banks in Nigeria

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

H₁₁: Digitization has significant effect on profit after tax of selected Commercial banks in Nigeria

H₀₂: Digitization does not affect return on equity of selected commercial banks in Nigeria.

H₁₂: Digitization affect return on equity of selected commercial banks in Nigeria.

1.5 Significance of the study

The study will aid commercial banks in Nigeria to understand banking in a new dimension. Revelations from the study will highlight the various benefits of digital banking and how these measures if properly taken can increase profitability. Apart from interest from loans and other investments commercial banks partake in, this study will also introduce a new model for banks to adopt-the customer convenience model (CCM). This model as presented in this study will enlighten managers of commercial banks on how to serve customers better while gaining their loyalty and resources. The study will be important to the future researchers, academicians and scholars. This is due to the fact that it will lay the foundation for further research and also, it will be used as a point of reference for future research. It additionally will provide literature review to future scholars and analysis of trends on the digitalization in the commercial banks. The findings of the study will be valuable to the government as it will enable them understand how digitization affects commercial banks profit and therefore be in a position to be able to formulate policies aimed at supporting the strategies used by the various institutions with regards to the use of technology in conducting their business and financial transactions in particular.

1.6 Scope of the study

The scope of this research work is limited to the study and investigation on the effect of digitization income of selected commercial banks on their profit after tax and also effect of digitization on the return on equity of the banks. Specifically, four (4) commercial banks were purposively selected based on the fact that they have been in existence and listed on the Nigeria Stock Exchange Market during the period of our studies. This method takes cognizance of their consistency on the floor of stock market during the period under consideration and hence availability of data. The research work covered a period of 13 years, from 2006 – 2018. The period was chosen so as to capture the growth trend of digitization income. Also the banks chosen for this work are selected from the list of systemic important banks to the Central Bank of Nigeria (CBN).

1.7 Limitations of the study

This study seeks to analyze the impact of digitization on the overall profitability of the financial institutions in Nigeria. In the course of data capturing for this work, the information available at the time was very limited. The study is limited to data available to public contained in the financial annual report of banks in Nigeria. The data source is secondary data. Also available data were limited as only about 13years data is available from 2006 to 2018. Also the banks data available were not broken down to various contributing digital channels.

REVIEW OF RELATED LITERATURE

2.0 Conceptual review

This literature review consists of conceptual review, theoretical review regarding banking digitization and profitability in banks and also the empirical review.

2.1 Bank Profitability

Banks make profit by earning more money than what they pay in expenses. The major portion of a bank's profit comes from the fees that it charges for its services (Non Interest Revenue) and the interest that it earns on its assets and revenues from its liabilities (Net Interest Income). Its major expense is the interest paid on its liabilities. The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market.

Banks increase profits by using leverage — sometimes too much leverage, which helped precipitate the credit crisis that occurred in 2007 to 2009. Profits can be measured as a return on assets and as a return on equity. Because of leverage, banks earn a much larger return on equity than they do on assets.

Profit Measures: Return on Assets and Return on Owners' Equity

The traditional measures of the profitability of any business are its return on assets (ROA) and return on equity (ROE). Assets are used by businesses to generate income. Loans and securities are a bank's assets and are used to provide most of a bank's income. However, to make loans and to buy securities, a bank must have money, which comes primarily from the bank's owners in the

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

form of bank capital, from depositors, and from money that it borrows from other banks or by selling debt securities—a bank buys assets primarily with funds obtained from its liabilities as can be seen from the following classic accounting equation

$$\text{Assets} = \text{Liabilities} + \text{Bank Capital (Owners' Equity)}$$

The ROA is determined by the amount of fees that it earns on its services and its net interest income:

Net interest income depends partly on the interest rate spread, which is the average interest rate earned on its assets minus the average interest rate paid on its liabilities.

$$\text{Interest Rate Spread} = \text{Average Interest Rate Received on Assets} - \text{Average Interest Rate Paid on Liabilities}$$

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2.2 Digital banking

The earliest forms of digital banking trace back to the advent of ATMs and cards launched in the 1960s. As the internet emerged in the 1980s with early broadband, digital networks began to connect retailers with suppliers and consumers to develop needs for early online catalogues and inventory software systems. By the 1990s the Internet became widely available and online banking started becoming the norm. The improvement of broadband and ecommerce systems in the early 2000s led to what resembled the modern digital banking world today. The proliferation of smartphones through the next decade opened the door for transactions that go beyond ATM machines. Over 60% of consumers now use their smartphones as the preferred method for digital banking. The challenge for banks is now to facilitate demands that connect vendors with money through channels determined by the consumer. This dynamic shapes the basis of customer satisfaction, which can be nurtured with Customer Relationship Management (CRM) software. Therefore, CRM must be integrated into a digital banking system, since it provides means for banks to directly communicate with their customers.

There is a demand for end-to-end consistency and for services, optimized on convenience and user experience (Surendran, 2012). The market provides cross platform front ends, enabling purchase decisions based on available technology such as mobile devices, with a desktop or Smart TV at home. In order for banks to meet consumer demands, they need to keep focusing on improving digital technology that provides agility, scalability and efficiency. The breakthrough techniques for reaching customers are becoming less expensive and less demanding than the traditional methods (Coiera, 2000) (Magatef & Tomalieh, 2015) (Wright, 2017). The Central Bank of Nigeria (CBN) also is very serious with its cashless policies which enhance the increased use of digital platforms by banks customers. Cashless economy does not mean an absolute dearth of cash transactions in the economic settings but one in which the amount of cash-related transactions are kept to the barest minimum (Apochi, 2017, Ezeamama, Ndubuisi, Marire, & Mgbodile 2014). Also a study conducted in 2015 revealed that 47% of bankers see potential to improve customer relationship through digital banking, 44% see it as a means to generate competitive advantage, 32% as a channel for new customer acquisition. Only 16% emphasized the potential for cost saving.

2.2.4 Challenges of Digitalization in Commercial Banks

A research by Daft (2012) demonstrated that the rise of digitalization may be a smart thought however with respect to customers they may confront some risk connected with the specific type of innovation. Daft identified what he described strategic risk management of financial institutions should know and understand risks associated with digitalization and provide remedies for it. Poor digitalization planning and investment decisions can increase a financial institution's strategic risk. The costs of establishing digitalization services are high. Establishing a trusted brand is very costly as it requires the purchase of expensive technology. Some of the problems that customers face in digitalization of banking services include risk arising from fraud, network and system errors and other unanticipated events resulting in the organization's inability to convey banking products and services. This risk could be inherent in different products and services (Earl, 2014). In his study Earl (2014) further commented that banking activities can expand their activities of establishment's and the amount of its transaction or operational risk, particularly if the organization is putting forth imaginative administrations that have not been institutionalized. Financial institutions should therefore provide reliable services to help customers gain easy access at all times.

Major benefits of digitization are, Business efficiency, Cost savings, increased accuracy, Improved competitiveness, Greater agility and Enhanced security

2.3 Theoretical review

Many technology adoption research studies use this theory developed by Fishbein and Ajzen in 1967. According to this theory, an individual's intent to adopt an innovation is influenced by his attitude toward the behavior and subjective norm. Subsequently, a

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

person's behaviour is determined by his intention to perform the behavior. The attitude toward performing the behaviour is an individual's positive or negative belief about performing the specific behaviour. The second reviewed theory is the Decomposed Theory of Planned Behavior (DTPB). The theory was developed by Taylor and Todd (1995). The theory postulates that the intention to use a certain technology is influenced by attitude, subjective norm and perceived behavioral control. Starting from the research conducted by MdNor and Pearson (2008), Karahanna, Straub, and Chervany (1999), certain influencing factors were selected: the attitude toward behavior and the perceived behavioral control. The third theory taken into consideration is the Innovation Diffusion Theory (IDT) that explains individuals' intention to adopt a technology as a modality to perform a traditional activity. The theory is developed by Roger's (1983). The critical factors that determine the adoption of an innovation at the general level are the following: relative advantage, compatibility, complexity, trial ability and observability. (Rogers, 1995). Researchers such as Tan and Teo (2000), Gerrard and Cunningham (2003) and MdNor and Pearson (2008) had tested the theory on the e-banking adoption.

2.5.4 Adopting automation

Digital services present unprecedented opportunities for banks to automate operations in myriad ways. While there is a caveat that the human touch should not be lost, the very nature of digital technologies lend themselves to automation. For example, the e-wallet, which stores all the customer data on the client or server side is a definitive shift towards improving customer experience. Block chain technology which is set to revolutionize digital transactions is another case in point. Banks should basically look at the entire chain of operations and identify repetitive and mundane tasks which are currently done by individuals. Splitting the entire process into smaller chunks and then exploring automation options with the technology partners is a good idea. A consequence of automation is a reduction in the workforce. This basically means the bank will have reduced its manpower costs, with an option to redeploy those whose jobs have been automated, to more useful pursuits. Digitalization also means banks increasingly need to mirror the underlying technologies in their outlook, plans and operations and hence a strategy of close cooperation with technology companies will be of benefit.

2.6 Empirical Review

The review of empirical literature gives an evidence-based and factual analysis of related works done in the country or outside and in the same area of study or related. Loide David & Dr. Teresia Kaulihowa (2018) analyzed the impact of electronic banking on commercial banks' performance in Namibia using the error correction modeling and the granger causality test for the period 2012M1 to 2015M8. The study concluded that there exists strong evidence that interbank settlement system, cheques, and electronic funds transfer were all positively related to the return on investment. The granger causality test, reported a bi-directional causality between the volume of electronic funds transfer and return on investment, whereas a unidirectional causality from the volumes of the interbank settlement system to return on investment was reported. The study concluded that all the diagnostic tests of the error correction model performed very well, meaning that the results of the study are robust, reliable and authentic. Policy recommendations emanating from the study suggest that the benefits of electronic banking will be realized if the volumes of electronic funds transitions are increased. Moreover, electronic banking plays a pivotal role in enhancing bank performance which will ultimately positively affect the macroeconomic fundamental. It has been established that they are positively and significantly related to the return on investment. Therefore, electronic funds transfer should be further enhanced by even encouraging the poor and the low-income earners to do their transactions electronically. Auwal Musaa, Shafiu Abubakar Kurfib & Haslinda Hassan (2015) on their work on The Impact of Online Banking on the Performance of Nigerian Banking Sector using secondary data and using frequency analysis of demographics of the banks, standard deviations, and mean differences (before and after the e-banking adoption) between banks. It is argued that majority of the business sectors, including banks, have taken advantage of using IT to enhance their business operations. The use of IT has led Nigerian banks to e-banking, and this e-banking has revolutionized the entire banking industry by scaling borders and bringing about new opportunities. Amu Christian Ugwueze and Nathaniel. C. Nwezeaku (2016) in their work E-Banking and Commercial Bank Performance in Nigeria: A cointegration and Causality Approach in analyzing the relationship between the e-banking (proxied by value of Point-of-Sale Terminal transactions) and commercial bank performance (proxied by savings, time, and demand deposits) in Nigeria using the Engle-Granger two steps cointegration method, The ADF unit root test shows that the e-banking is integrated of order zero (I(0)) whereas commercial bank performance are integrated of order one (I(1)). The estimates of the Engle-Granger cointegration tests show that POS is not cointegrated with both the savings and time deposits but are cointegrated with demand deposits. They concluded that a long-run relationship exist between POS and demand deposits in Nigeria.

Oloyede, Azeez and Aluko (2015) On how whether e-banking contribute to the economy of Nigeria assessed e-commerce and e-banking channels and their contributions to the Nigerian economy, sampling 100 respondents selected from banks and the general public. The study employed nonparametric statistics measure such as chi-square in testing the formulated hypothesis. The results

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

of the test established that e-commerce and e-banking have significant positive impact on the Nigerian economy. Shehu, et al (2013) In a study of electronic banking products and performance of Nigerian listed deposit money banks, examined all the twenty-one Deposit Money Banks (DMBs) listed on the Nigerian Stock Exchange and selected six (6) banks as sample for the study using systematic sampling technique. The study revealed that electronic banking products (e-mobile and ATM transactions) strongly and significantly impact on the performance of Nigerian banks. Njeru and Omagwa (2018) Contrary to popular findings, in a study of mobile banking and bank profitability in Kenya sourced primary data from 60 respondents through a structured questionnaire and analyzed the data using descriptive analysis and multiple regression analysis. The study found that transactions had a statistically significant effect on profitability while electronic funds transfer services and customization did not have a significant effect on profitability of tier 1 commercial banks in Kenya.

3. RESEARCH METHODOLOGY

This section deals with the method that were used in carrying out the study, the method of collection, of the information. It describes the sources of data, the population and sample. It also explains the research instrument and the procedure in which the instrument was used.

3.1 Research Design

A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. The plan is the complete scheme or program of the research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of data (Kerlinger 1986, 279). According to Thyer (1993) also define a research design as a blueprint or detailed plan for how a research study is to be completed-operationalizing variables so they can be measured, selecting a sample of interest to study, collecting data to be used as a basis for testing hypotheses, and analyzing the result. Onwumere (2005) observed a research design as a format which the researcher employs in order to systematically apply the scientific method in the investigation of problems. This research focuses on the empirical analysis of the significance of digitization on bank profitability. This research relied heavily on secondary data, generated from annual financial reports of the sampled banks between the periods of 2006-2018. This study is to employ an ex-post facto research design since researcher cannot manipulate the independent variables either because they have been manipulated or cannot be manipulated. In order to realize the objective of the study, the relevant variables include income from digital channels and Profit After Tax (PAT). The first being the independent variables while the other is dependent variable. The study covers the four (4) Deposit Money Banks in Nigeria namely: Zenith bank Plc, First Bank, United bank for Africa and GT Bank. The data to be used for the analysis are entirely secondary data covering 2006 to 2018. They will be obtained from the Annual Financial Statement of Account of Various Banks. Research methodology is the strategy or design used by a researcher to carry out an investigation during his research in an organized and efficient manner in order to help decision making to be more effective and objective.

3.2 Method of data Collection

The data for this research is secondary data. The data is collected from annual financial reports of banks as reported to the Nigeria Stock Exchange (NSE) and also from the data of the central bank of Nigeria (CBN).

3.3 Population


The population of this study consists of all the twenty-two (22) deposit money banks in the Nigerian banking industry.


3.4 Sample

The sample size is four (4) banks out of the twenty-two (22) commercial banks representing a 18.18% of the population. The criteria used to arrive at the sample choice can be summarized as;

- ✚ Banks that stand-alone from 2006 to 2018.
- ✚ Banks that all its merged or acquired components were quoted on the floors of the Nigerian stock exchange.
- ✚ Banks consistent in the publication of audited annual financial statements.
- ✚ Banks that consistently sent their annual audited financial accounts to the Nigerian stock exchange.
- ✚ Consequently, four (4) out of the twenty-two (22) consolidated banks now in Nigeria constituted our sample size based on all of the above as they particularly met the data availability criteria set by the researcher as data about them were collected for this study. The banks selected are;
- ✚ First Bank Plc
- ✚ Zenith Bank Plc

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

 United Bank for Africa Plc

 GT Bank Plc

3.5 Sampling technique

The sampling technique adopted is the discretionary sample techniques. This is influenced by availability of data, ease of collection, relevancy of the data and consistency of data.

All the banks selected met the criteria and were not involved in any mergers or acquisition in the years under review.

3.6 Validity of the instrument

Validity refers to the extent that the instrument measures what it was designed to measure. The instrument used in this research met these criteria.

3.7 Reliability of the instrument

Reliability refers to the extent that the instrument yields the same results over multiple trials. The instrument in this study is reliable.

3.8 Method of data analysis

The study adopts Regression Analysis in analyzing data collected from the financial statement of each of the selected banks for thirteen (13) for years from 2006 to 2018. The data was analyzed and summarized. The analysis was made using SPSS 23. Descriptive analysis, correlation analysis and regression analysis were used.

3.9 Model Specification

The model employed in this study is built on the modification of the models in Busari and Adeniyi (2017) and Boboye and Grace (2016). In their study the model was specified as:

$$Y = \beta_0 + \beta_1 X + \mu$$

Y = Profit After Tax (PAT)

X = Digital Channels Income (DCI)

β = Coefficient of profitability

μ = Error term

3.10 Measurement of Variables

PAT represents the profit after tax of the commercial banks. This profit is also termed the annual profit of the bank. It is mathematically represented as

$$PAT = PBT - \text{Income Tax Expenditure}$$

This is in accordance to the International Financial Reporting Standards (IFRS) as adopted by the Financial Reporting Council of Nigeria (FRCN). Digital Channels Income (DCI) is defined as net income earned across various self-service channels deployed by commercial banks like POS, ATMs, Mobile Apps etc

4. DATA PRESENTATION AND ANALYSIS

4.0 Summary of Descriptive Statistics

This chapter presents the results generated by the model specified in the previous chapter and afterwards analyzes the results empirically. The results to be presented and analyzed include descriptive statistics, graphical analysis, unit root and co-integration test which all belong to preliminary analysis. It also presents the estimation result.

4.1 Descriptive Statistics

Descriptive statistics show us the qualities of the data we are using for estimation, the knowledge of which allows us to define the appropriate methodology for estimation. The table below summarizes the descriptive statistics:

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Summary of Descriptive Statistics

Table 4.10

Bank	R ²	F _{tab}	F _{cal}	Durban Watson
GT	0.416	0.017	7.836	1.276
Zenith	0.666	0.001	21.972	0.789
UBA	0.149	0.173	2.097	0.624
FBN	0.10	0.017	1.229	0.516

Source: Compiled from SPSS 23 results

Table 4.11 Zenith Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.816 ^a	0.666	.636	3519.9910	.666	21.972	1	11	.001	.789

a. Predictors: (Constant), Y b. Dependent Variable: X

Source SPSS

Table 4.12 Zenith Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
	1 (Constant)	-1059.394	1850.558				-.572	.579		
Y	0.094	.020	.816	4.687	.001	.816	.816	.816	1.000	1.000

Source SPSS 23

Table 4.13 GT Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.645 ^a	.416	.363	3142337.058	.416	7.826	1	11	.017	1.276

a. Predictors: (Constant), Yb. Dependent Variable: X

Source SPSS 23

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Table 4.14 GTCoefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	2492219.953	1574642.102		1.583	.142					
Y	.049	.017	.645	2.797	.017	.645	.645	.645	1.000	1.000

a. Dependent Variable: X

Source SPSS 23

Table 4.15 UBA Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.386 ^a	.149	.078	8828.71800	.149	2.097	1	12	.173	.624

a. Predictors: (Constant), Yb. Dependent Variable: X

Source SPSS 23.

Table 4.16 UBA Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	7650.435	4364.727		1.753	.105	-1859.488	17160.358					
Y	.176	.122	.386	1.448	.173	-.089	.441	.386	.386	.386	1.000	1.000

a. Dependent Variable:

Source: SPSS 23

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Table 4.17 FBN Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.317 ^a	0.1	0.019	9870.042	0.1	1.229	1	11	0.291	0.516

a. Predictors: (Constant), DCI b. Dependent Variable: PAT

Source: SPSS 23

4.2.1 Hypothesis One –

H₀₁: Digitization has no significant effect on PAT of GT Bank, Zenith, UBA and FBN.

H₁₁: Digitization has significant effect on PAT of GT Bank, Zenith, UBA and FBN.

Statistically stated as

H₀₁: $\mu=0$ Vs **H₁₁:** $\mu\neq 0$

GT Bank

In this model, the relationship can be itemized as follows:

$$PAT(GT) = f(DI)$$

The relationship of the model will be itemized as follows;

$$PAT(GT) = 2492219.95316242 + 0.049DI.$$

The R² which is the co-efficient of determinant measures the proportion of variation in the dependent variables which is explained by the independent variables. The value of R² =0.416 shows that 41.6% of the variation in PAT of GT Bank is explained by the Digital Income. The adjusted R² is 36.3% and it is also significant. Since F-calculated from the ANOVA table is 7.836 and it is greater than f- tabulated 0.017 at n-1 degrees of freedom respectively we reject the H₀ and also conclude that it is highly significant. The Durbin-Watson statistics is 1.276 shows the presence of serial-auto –correction. Hence, we reject H₀₁ and conclude that there is a relationship between the DI(GT) and PAT(GT).

Also in the test of significance t- calculated at 95% level of significant is 1.583 while the p-value is less than 0.05, we also conclude that there is a relationship between the DI(GT) and the PAT(GT) and the conclusion of t-test is also significant

Zenith Bank

In this model, the relationship can be itemized as follows:

$$PAT(ZB) = f(DI)$$

The relationship of the model will be itemized as follows;

$$PAT(ZB) = -1059.394 + 0.094DI.$$

The R² which is the co-efficient of determinant measures the proportion of variation in the dependent variables which is explained by the independent variables. The value of R² =0.666 shows that 66.6% of the variation in PAT of Zenith Bank is explained by the Digital Income. The adjusted R² is 63.6% and it is also significant. Since F-calculated from the ANOVA table is 21.972 and it is greater than f- tabulated 0.001 at n-1 degrees of freedom respectively we reject the H₀ and also conclude that it is significant. The Durbin-Watson statistics is 0.789 shows slight presence of serial-auto – correction. Hence, we reject H₀₂ and conclude that there is a relationship between the DI(ZB) and PAT(ZB).

Also in the test of significance t- calculated at 95% level of significant is – 0.572 while the p-value is less than 0.05, we also conclude that there is a relationship between the DI(ZB) and the PAT(ZB) and the conclusion of t-test is also significant.

UBA

In this model, the relationship can be itemized as follows:

$$PAT(UBA) = f(DI)$$

The relationship of the model will be itemized as follows;

$$PAT(UBA) = 753.435 + 0.176DI.$$

The R² which is the co-efficient of determinant measures the proportion of variation in the dependent variables which is explained by the independent variables. The value of R² =0.149 shows that 14.9% of the variation in PAT of UBA is explained by the Digital Income. The adjusted R² is 7.8% shows little or weak relationship, though significance. Since F-calculated from the ANOVA table is

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

2.097 and it is greater than f -tabulated 0.173 at $n-1$ degrees of freedom respectively we reject the H_0 and also conclude that it is significant. The Durbin-Watson statistics is 0.624 shows slight presence of serial-auto – correction. Hence, we reject H_{03} and conclude that there is a relationship between the DI(UBA) and PAT(UBA).

FBN

In this model, the relationship can be itemized as follows:

$$\text{PAT(FBN)} = f(\text{DI})$$

The relationship of the model will be itemized as follows;

$$\text{PAT(FBN)} = 9270.66 + 0.123\text{DI}.$$

The R^2 which is the co-efficient of determinant measures the proportion of variation in the dependent variables which is explained by the independent variables. The value of $R^2 = 0.10$ shows that 10.% of the variation in PAT of FBN is explained by the Digital Income. The adjusted R^2 is 1.90% and it is also significant. Since F -calculated from the ANOVA table is 1.229 and it is greater than f -tabulated 0.017 at $n-1$ degrees of freedom respectively we reject the H_0 and also conclude that it is highly significant. The Durbin-Watson statistics is 0.516 shows the presence of serial-auto –correction. Hence, we reject H_{01} and conclude that there is a relationship between the DI(FBN) and PAT(FBN).

Also in the test of significance t -calculated at 95% level of significant is 1.583 while the p -value is less than 0.05, we also conclude that there is a relationship between the DI(FBN) and the PAT(FBN) and the conclusion of t -test is also significant.

4.2.2 Hypothesis Two –

H₀₂: Digitization does not affect return on equity of selected commercial banks in Nigeria.

H₁₂: Digitization affect return on equity of selected commercial banks in Nigeria.

Decision Rule: We will reject H_0 if the p -value is less than alpha (α). $\alpha = 0.05$.

Dependent Variable: Return on equity

Included observations: 52

Variable	Coefficient	Std. Error	t-Statistic	P-Value
ROE	47081.86	9753.966	4.826945	0.0000
DIGITAL_INCOME	0.784443	0.793314	0.988819	0.3275

R-squared	0.019180	Mean dependent var	54504.53
Adjusted R-squared	-0.000436	S.D. dependent var	44902.50
S.E. of regression	44912.29	Akaike info criterion	24.30051
Sum squared resid	1.01E+11	Schwarz criterion	24.37556
Log likelihood	-629.8133	Hannan-Quinn criter.	24.32928
F-statistic	0.977762	Durbin-Watson stat	0.677565
P-Value	0.327513		

4.4 Discussions of findings.

In all the banks whose data are tested in the first hypothesis, it is found that there is significant effect of digitization on profit after tax. In all of them we rejected the null hypothesis of no significant effect and accepted the alternative that there is significant effect of digitization on commercial banks profitability.

Also, in the second test of hypothesis we found out that the R-Squared statistic (0.019180) shows that only about 1.92% of the variation in ROE is explained by digitization. This is very poor. The model is inadequate for prediction. Since the p -value (0.327513) is less than the alpha (0.05), we will not reject the null hypothesis, so we conclude that digitization does not affect return on equity

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

of selected commercial banks in Nigeria. This implies that even though digital income has made some impact on the return on equity the impact is not significant – the impact is still trivial.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

The research work on the effect of digitization on profitability of commercial banks in Nigeria was set out with the objectives of ascertaining the effect of digitization on commercial banks profitability

The review of data from four commercial banks showed that using the regression model, there is significant effect of digitization on the the profitability of GT Bank, Zenith bank, UBA and FBN with R^2 of 0.416, 0.666, 0.149 and 0.10 respectively. This means that the proportion of dependent variables (profit after tax) which is explained by the independent variables (digital incomes) for the banks are 41.6%, 66.6%, 14.9% and 10% respectively.

Also in all the banks studied, it was found that digitization does not have effect on the return on equity of the commercialbanks.

5.2 Conclusion

From the study, it can be seen that digitization affects profit after tax of GT, UBA, Zenith and FBN. Alsoit can also be seen thatfrom the analyzed available data, thereis no effect of digitization on return on equity of the commercial banks selected.

5.3 Recommendations

Following the above inferences from empirical evidence, the study hereby makes the following recommendations:

1. That, commercial banks should intensify effort to deploy more digital channels delivery points and also make them more effective and efficient.
2. That, commercial banks should endeavour to reactive all moribund channels like ATMs, POS terminals, mPOS etc in order to ease the tension experienced by customers in trying to get their services; and also to reap the benefit in terms of cost reduction.
3. Banks should investigate factors that would make digital banking channels more attractive to customers, noting the setbacks with a view to addressing them, so that, Nigerians will begin to get the full benefits of digitization as in other climes.
4. The regulatory authorities should also collaborate with the banks to put in place an enabling operating environment and regulatory framework to bring out optimal deployment of these services to customers. This is especially with respect to addressing the issue of failed transactions.
6. Banks should invest in good softwares to monitor their platforms and provide proactive support to customers who use their digital channels
7. There should be periodic review of the digital channels to ascertain its effectiveness and importance in serving customer's needs.

5.4 Recommendations for Further Studies

The results from the tested hypothesis of the study established that there is significant effect of digital income on profitability of banks in Nigeria. This research work thereby contributes to literature both in theoretical and practical aspects of digitization in Nigeria and banking profitability. As with all good research work, a deeper understanding of the process raises additional usually more difficult or more subtle questions. The areas suggested for further studies thus include:

- i. The Authority should conduct further research to establish how the self-service channels can be improved with minimal disruption and down time
- ii. The current digital channels may not be as effective as expected by consumers and more research should be made to adopting a very secured and effective digital channels.
- iii. Fraud prevention in digitization adoption by banks should be a very key area of interest to reduce and or eliminate economic wastes and loss due to criminals.
- iv. The emergency of cybercrime as a complex fraud instrument within the financial sector and initiatives to combat this problem should be looked into as well as;
- v. Effect of government reforms in combating financial fraud activities;
- vi. The efficacy of the Central Bank of Nigerian in providing oversight on banks activities;

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

- vii. Self-service dispute resolution and effectiveness
- viii. The Existence of Fraud Indicators in.
- ix. Future studies should focus efforts at gathering information from the financial institution to break down the various income lines of the digital channels for review.

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APPENDICES

Appendix 1

Table A1

Bank	Year	DCI	PAT
GT Bank	2006	1,952	10,025
GT Bank	2007	2,102	15,350
GT Bank	2008	2,465	27,199
GT Bank	2009	3,103	28,603
GT Bank	2010	3,522	39,604
GT Bank	2011	5,254	51,742
GT Bank	2012	5,998	87,296
GT Bank	2013	6,698	90,024
GT Bank	2014	7,877	89,171
GT Bank	2015	15,564	94,308
GT Bank	2016	11,236	124,200
GT Bank	2017	6,302	158,728
GT Bank	2018	8,020	166,920

Source: Author's computations from published annual financials from 2006 to 2018

Table A

Bank	Year	DCI	PAT
Zenith	2006	1,735	11,617
Zenith	2007	2,024	18,779
Zenith	2008	6,304	51,993

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Zenith	2009	2,373	20,603
Zenith	2010	2,224	37,823
Zenith	2011	3,293	48,704
Zenith	2012	3,637	100,681
Zenith	2013	2,509	95,318
Zenith	2014	2,686	99,455
Zenith	2015	9,986	98,784
Zenith	2016	10,687	113,885
Zenith	2017	14,145	153,003
Zenith	2018	20,422	165,480

Source: Author's computations from published annual financials from 2006 to 2018

Table A3

Bank	Year	DCI	PAT
UBA	2006	2493	11468
UBA	2007	2524	19,831
UBA	2008	3130	40002
UBA	2009	14386	12,889
UBA	2010	11,027	-6,295
UBA	2011	6,816	-7,966
UBA	2012	7,217	47,375
UBA	2013	8,135	46,483
UBA	2014	9,420	40,083
UBA	2015	14,065	47,642
UBA	2016	25,571	47,541
UBA	2017	20,920	41,396
UBA	2018	27,923	41,047

Source: Author's computations from published annual financials from 2006 to 2018

Table A4

Bank	Year	DCI	PAT
FBN	2006	1,123	14,069
FBN	2007	1,641	18,355
FBN	2008	2,141	30,473
FBN	2009	8,498	1,275
FBN	2010	9,608	26,936
FBN	2011	17,637	23,052
FBN	2012	20,310	71,144
FBN	2013	7,648	59,365
FBN	2014	11,465	84,011
FBN	2015	15,371	15,148
FBN	2016	21,837	12,243
FBN	2017	24,989	37,708
FBN	2018	34,029	59,667

Source: Author's computations from published annual financials from 2006 to 2018

Table A4 ROE Table

Year	GT Bank	Zenith	UBA	FBN
2006	29.50%	9.35%	44.72%	6.50%
2007	28.10%	9.69%	49.39%	7.40%
2008	30.67%	9.71%	52.27%	8.10%

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

2009	29.00%	10.83%	61.11%	4.00%
2010	29.50%	11.16%	65.64%	6.50%
2011	33.20%	14.47%	46.70%	7.20%
2012	28.40%	20.35%	56.44%	5.09%
2013	32.10%	18.49%	50.41%	5.05%
2014	30.67%	19.70%	51.13%	2.50%
2015	27.87%	19.39%	46.56%	1.81%
2016	31.95%	19.24%	48.66%	4.44%
2017	31.74%	20.86%	52.21%	5.09%
2018	37.16%	23.55%	52.43%	5.05%

Source: Author's computations from published annual financials from 2006 - 2018

APPENDIX 2

Table B1 Industry E-Payment Figures for January to September 2019

Channels	Volume	Value
Cheques	5,339,207	3,370,618,154,501
ACH/NAPS/PMS	32,591,744	17,966,006,189,365
ATM	637,446,114	4,861,354,810,064
PoS	309,040,167	2,240,487,311,012
Internet (Web)	74,669,767	344,470,138,769
Mobile Money	217,841,265	3,393,856,125,334
NIP	803,149,223	75,532,068,750,446
EBillsPay	874,983	428,893,076,842
Remita	34,723,637	14,816,789,309,238
m-Cash	196,245	511,484,268
Central Pay	509,793	4,037,037,409
Intra-bank e-payment transactions	89,885,201,152	304,782,795,625,953.00

Source: CBN website

Table B2 Industry E-Payment Figures for Half-Year 2019

Channels	Volume	Value
Cheques	3,416,537	2,270,918,124,880
ACH/NAPS/PMS	20,645,867	11,596,466,907,139
ATM	424,619,677	3,238,428,825,512

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

PoS	187,695,159	1,383,623,971,523
Internet (Web)	47,976,900	223,903,196,607
Mobile Money	104,773,933	1,965,744,558,870
NIP	504,160,651	49,350,175,895,415
EBillsPay	616,651	281,563,756,185
Remita	21,614,846	9,839,289,765,396
m-Cash	119,197	380,846,081
Central Pay	398,520	2,835,356,208
Intra-bank transactions e-payment	1,756,300,720.57	203,354,947,606,508.00

Source: CBN website

Table B3 Industry E-Payment Figures for 2018

Channels	Volume	Value
Cheques	9,019,278	5,035,334,949,690.47
NEFT	26,760,852	11,030,961,545,925.40
ATM	875,519,307	6,480,085,899,670.37
POS	295,890,167	2,383,108,901,148.12
WEB	50,815,901	404,600,990,712.52
MMO	87,086,260	1,830,701,111,107.85
NIP	663,124,139	80,423,025,698,377.30
EBILLSPAY	1,053,342	500,214,507,607.64
REMITA	44,461,846	18,495,987,427,570.80
NAPS	27,384,756	12,078,905,639,559.80
M-CASH	229,328	1,198,731,322.12
CENTRALPAY	1,260,380.00	8,101,555,613.4

Source: CBN website

Table B4 Volume of E-Payment Channels From 2012 TO 2018

	2018	2017	2016
Cheques	9,019,278	10,808,983	11,719,847
NEFT	26,760,852	31,034,624	29,754,182

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

ATM	875,519,307	800,549,099	590,238,934
POS	295,890,167	146,267,156	63,715,203
WEB	50,815,901	28,991,097	14,088,247
MMO	87,086,260	47,804,561	47,053,252
NIP	663,124,139	370,870,672	153,616,450
EBILLSPAY	1,053,342	905,941	1,026,886
REMITA	44,461,846	39,706,264	38,249,886
NAPS	27,384,756	11,900,008	3,965,212
M-CASH	229,328	77,832	-
CENTRALPAY	1,260,380.00	375,356	70,239

Source: CBN website

Table B5 Value of E-Payment Channels From 2012 TO 2018

	2018	2017	2016
Cheques	5,035,334,949,690.47	5,381,909,711,667.16	5,829,549,268,629.00
NEFT	11,030,961,545,925.40	14,946,463,879,672.40	14,584,802,657,086.00
ATM	6,480,085,899,670.37	6,437,592,402,748.64	4,988,133,401,544.00
POS	2,383,108,901,148.12	1,409,813,091,608.35	758,996,505,702.00
WEB	404,600,990,712.52	184,596,629,926.57	132,360,333,369.00
MMO	1,830,701,111,107.85	1,101,998,974,555.00	756,897,483,653.00
NIP	80,423,025,698,377.30	56,165,666,312,858.10	38,109,061,203,852.00
EBILLSPAY	500,214,507,607.64	550,750,791,543.15	339,407,748,303.63
REMITA	18,495,987,427,570.80	13,529,495,515,408.40	10,652,493,933,099.30
NAPS	12,078,905,639,559.80	4,960,349,089,466.59	753,689,705,802.99
M-CASH	1,198,731,322.12	616,936,468.57	-
CENTRALPAY	8,101,555,613.41	4,996,845,611.06	1,442,064,836.87

Source: CBN website

Effect of Digitization on the Profitability of Selected Commercial Banks in Nigeria (2006 - 2018)

Table B6 Volume of E-payment in Nigeria

Below are some statistical data on varying e-payment channels in Nigeria from 2012- 2016.

Volume of e-Payment Channels from 2012 to 2016

	Cheques	NEFT	ATM	POS	WEB	MMO	NIP
2012	12,161,694	28,941,559	375,513,154	2,587,595	2,276,464	2,297,688	4,449,654
2013	14,211,078	29,834,317	295,416,724	9,418,427	2,900,473	15,930,181	17,112,158
2014	15,283,933	29,690,765	400,269,140	20,817,423	5,567,436	27,744,797	40,829,854
2015	13,466,461	28,935,605	433,695,748	33,720,933	7,981,361	43,933,362	71,223,545
2016	9,764,546	24,498,267	470,894,452	47,743,919	10,499,911	37,339,510	111,151,384

Source: CBN website

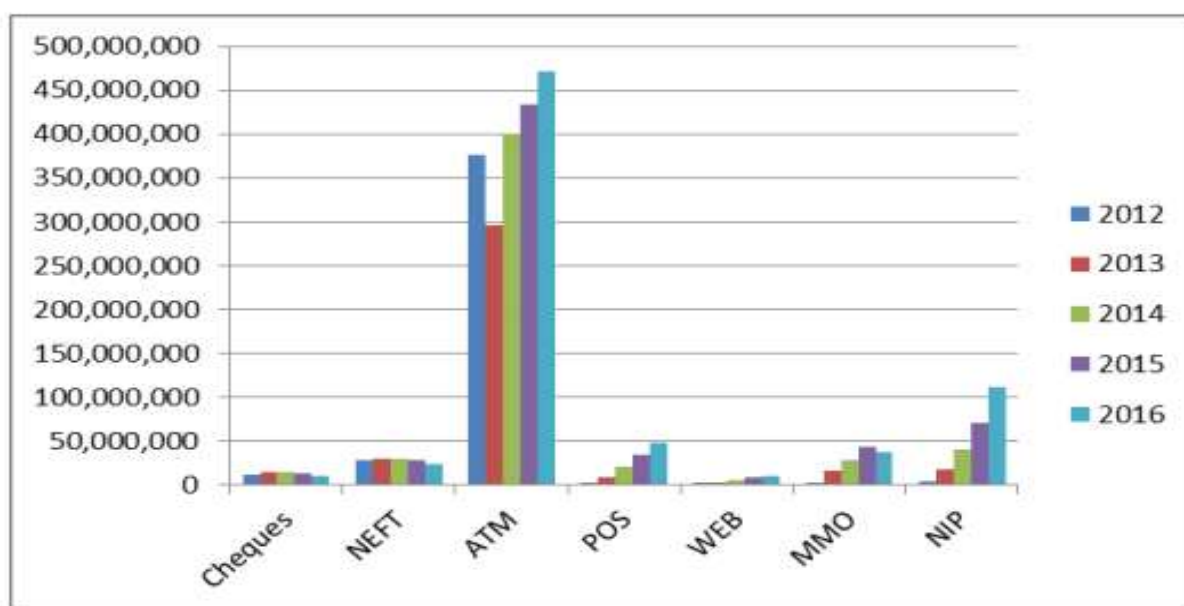
Table B7 Analysis digital channels transaction volumes 2012 to 2016

	Cheques	NEFT	ATM	POS	WEB	Mobile Money	NIP
2012	7,487,411,604,335	13,753,178,360,585	1,984,990,636,830	48,461,883,431	31,567,364,087	31,509,334,783	3,890,260,230,695
2013	7,708,669,754,031	14,367,950,496,617	2,830,533,105,570	161,212,840,665	47,316,331,494	143,371,761,235	10,848,734,178,263
2014	7,269,079,332,311	14,563,804,544,654	3,681,980,955,458	312,071,736,903	74,205,599,261	339,236,832,967	19,921,499,572,670
2015	6,195,461,481,268	13,087,085,484,769	3,971,651,486,420	448,512,548,727	91,581,292,533	442,353,763,489	25,540,842,563,780
2016	4,767,269,976,809	12,243,431,013,495	3,921,035,087,368	570,232,242,990	101,090,622,496	589,343,474,481	29,613,944,668,131

Source: CBN website

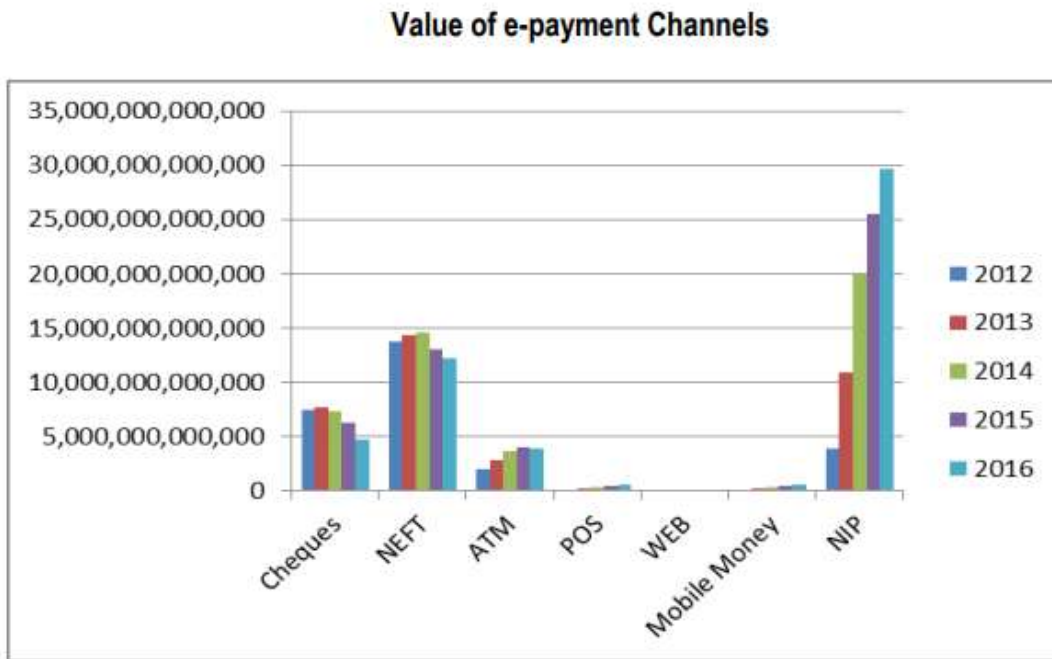
Table B8 Volume of e-payment channels

Volume of e-payment Channels



Source: CBN Website

Table B9 Value of e-payment channels



Recommendations

In view of the above, we recommend that the under listed platforms be made to showcase the data of our reports going forward periodically. This could be weekly, monthly, quarterly, annually or bi-annually.