NATIONAL COLLEGE OF IRELAND

ELECTRONIC PAYMENT SYSTEM: EFFECT ON FINANCIAL INCLUSION IN NIGERIA

By

NWOBU EMMANUEL KENECHUKWU (18165583)

UNDER SUPERVISION OF

PROF. VICTOR DEL ROSAL

4TH MAY, 2022

ABSTRACT

In a country like Nigeria, there is still a study gap on the contribution of e-payment platforms to financial inclusion. Investigating the contribution of e-payment platforms to financial inclusion in Nigeria would help formulation of policies and strategies that support bringing financial services closer to the people for increased economic activities. Against this background, the need to carry out this research becomes necessary. The study determined the effect of electronic payment systems on financial inclusion in Nigeria from 2008 to 2021. The objectives were: to determine how internet access affects access to financial services in Nigeria; to ascertain how financial literacy effects access to financial services in Nigeria and to ascertain how changes in technology affects access to financial services in Nigeria. An ex-post facto research design was adopted for this study to achieve the objectives of the study using disaggregated data on internet access, financial literacy and changes in technology as well as data on access to financial services in each of the states in Nigeria. data was gathered from Central Bank of Nigeria e-payment insights as well as from yearly report of Central Bank of Nigeria monetary consideration procedure execution from 2008 to 2021 and it was investigated utilizing Ordinary Least Square (OLS) relapse model with the guide of SPSS form 23.0 .Internet access was found to have a statistically significant impact on access to financial services in Nigeria (R = .509, P = 0.000 at P < 0.05). The review laid out that financial literacy significantly affects access to financial services (R = .690, P = 0.000 at P < 0.05). There was huge connection between changes in technology and financial inclusion in Nigeria (R = .500, P = 0.000 at P < 0.05). The regression coefficients (β) of 0.928, 0.855 and 1.007 show that increased internet access, financial literacy and use of mobile banking (changes in technology) would have positive contribution on access to financial services in Nigeria. Findings from this study therefore suggest that the

application of technology in Nigeria's financial system will ultimately increase financial services to the unbanked. Additionally, financial literacy affects financial advancement which assumes a fundamental part in making a suitable monetary framework. In view of the discoveries, it was suggested that states and strategy producers in Nigeria are advised to formulate policies concerning the monetary administrations by carrying out certain mediations to improve the business climate fundamental for economic growth, including banks and other monetary establishments, to work and grow financial inclusion

DECLARATION

The work submitted for examination is totally my own work and all the work and materials consulted in the process of producing the dissertation are accordingly, accurately and properly acknowledged

ACKNOWLEDGEMENT

This is to acknowledge my Supervisor, Prof. Victor Del Rosal, for his support during the dissertation supervision

TABLE OF CONTENTS

INTRODUCTION

1.1 Background to the Study

The rise of Information and Communication Technology (ICT) has totally changed the lives and mode of operation of people and organizations (Kabir, Saidin and Ahmim, 2015). Its approach along with advanced in technology has made incredible transformative improvement in finance, financial matters, and functional expenses and improved business performance (Slozko and Pello, 2015). This advancement combined with worldwide expansion of the internet and its fast utilization over the course of the years is liable for the powerful change in transactions in the business world, from the conventional money based exchanges to electronic-based payments and the help of electronic trade in global business climate (Fernandes, 2013; Kabir, Saidin and Ahmim, 2015).

Electronic payment system, therefore, consists of different technological platforms that allow people, firms and government to access cash or transfer money using electronic channels provided by banking institution in the locality (Paul and Friday, 2012). It refers to the exchange of electronic payment value from a buyer to a seller through an online payment channel that allows customers to remotely access and manage their accounts and financial exchanges through an electronic system. In financial transactions and business in general, the advent of electronic payment systems has moved financial activities from a relatively stable traditional environment to electronic activities, without the need for an organization. practical organization, ensuring faster transactions, due to reduced queues at the point of sale. ; improved hygiene (eliminates the spread of bacteria when handling banknotes and coins); Sales increase; easy collection (eliminates the time of collecting, counting and

sorting coins); and employee rights management (Asiimwe, 2015; Ugwueze & Nwezeaku, 2016; Teoh et al., 2013).

It can be asserted that the application of technology in a country's financial system will ultimately increase financial services to the unbanked. Financial Inclusion, in this sense, refers to access to financial services by the vulnerable group in the society. The major role of financial inclusion in poverty reduction and balanced economic growth has being recognized in several extant studies. For instance, Morgan and Long (2020) suggested access to financial services as one of the measurements of financial inclusion which involves two major components: investing in financial products and actively consuming financial products.

Nigeria is a country in sub-Saharan Africa and the country's National Bureau of Statistics puts the country's population at about 200 million people as at 2019. With this figure, the nation is positioned as Africa's most populated country. However, the standard of living in the country is not the highest in Africa because of its lower per capita income. Also, according to National Bureau of Statistics, 70% of Nigeria population live below poverty line, while nearly 60% of those that live below poverty line are in the rural areas of the country. Since majority of the poor people live in the rural areas, necessary actions should be channelled towards this segment of the society. One of the major ways of helping them access basic needs of life would be financial empowerment vis-à-vis financial inclusion.

Across the rural areas in Nigeria, there exist pockets of small businesses. But these businesses are usually not sustainable and hardly survive harsh economic environment in the country possibly because of poor access roads and absence of financial services in the areas. This situation implies that only wealthy individuals and

urban areas usually enjoy the privileges accruing to access to financial services while low income earners and rural areas are usually left out. Without doubt, it is possible that creating access to financial services in these areas will pull these people from poverty as there may not be need of siting many bank branches in these locations. Rather, providing e-payment platforms in these places may facilitate integration of the people in the mainstream financial system of the country.

Consequently, interest in electronic payment system has grown in recent years because of its perceived role on financial inclusion. Governments and some multi-national organizations have made efforts to reduce poverty level in the world through financial inclusion. Without doubt, survival of any nation partly depends on ensuring financial inclusion for meaningful economic growth and development. For true measurement of economic activities in Nigeria, there is need to consider contribution of e-payment channels on financial inclusion for meaningful economic policy formulation and implementation.

Prior research has looked into a variety of topics related to financial inclusion and technology, including the promotion of economic development through financial inclusion (Sarma and Pais, 2011), financial inclusion and economic growth (Mohan, 2006), country-specific financial inclusion strategies (Fungáová and Weill), achieving financial inclusion through financial institutions (Ghosh, 2013), and the role of financial technology in promoting financial inclusion (Donovan, 2012), among others. Yet, none of these studies, to the best of the researcher's knowledge, has explained the effect of electronic payment system in promoting financial inclusion in a developing country like Nigeria. This study will therefore fill this gap by showing the relationship between e-payment system and economic growth through financial inclusion in Nigeria.

1.2 Statement of Problem

Traditional banking has made strides towards financial inclusion in Nigeria, as it has in many other emerging economies, use electronic payment systems. In a country like Nigeria, however, there is still a coverage gap as most remote areas do not have banks which has hampered growth of small businesses especially in agriculture and transportation. Hence, poverty reduction objective becomes difficult to achieve. Therefore, there is need for the traditional banking channels to be supported by electronic payment system to provide robust financial services to the burgeoning millions of people and ensuring an inclusive economic growth in Nigeria. The major contribution of e-payment is the enablement of users to transfer and make payment both comfortably and efficiently (Shankar and Datta, 2018). Financial inclusion can only be achieved with a reduced operational cost, enlarged coverage area and deeper penetration of financial services to the remotest unbanked areas that are untouched by the financial services. Investigating the contribution of e-payment platforms to financial inclusion in a developing country like Nigeria would help formulation of policies and strategies that support bringing financial services closer to the people for increased economic activities.

Many scholars have contributed to financial inclusion as an emerging topic in finance. Oyelami et al (2020) examined the determinants of e-payment adoption and impact on consumption pattern in Nigeria. Amoah and Korle (2020) took a different line and investigated the factors that make people use mobile money in Ghana. In the interim, Morgan and Long (2020) checked out at the connection between monetary education and monetary consideration. In a developing country like Nigeria, however, no one has looked into the link between e-payments and financial inclusion. Investigating the contribution of e-payment platforms to financial inclusion

in a developing country like Nigeria would help formulation of policies and strategies that support bringing financial services closer to the people for increased economic activities.

This study would play a vital role in determining whether establishment of e-payment channels in these areas will support financial inclusion and reduce poverty. Presently, there is paucity of research findings in Nigeria that show relationship between e-payment system and economic growth through financial inclusion.

1.3 Objectives of the study

The study's main goal was to determine the effect of electronic payment systems on financial inclusion in Nigeria. The specific objectives are to:

i. Determine how does internet access affect access to financial services in Nigeria;
ii. Ascertain how does financial literacy affect access to financial services in Nigeria; and
iii. Ascertain how changes in technology affects access to financial services in Nigeria.

1.4 Research Question

The main research question was: What is the effect of electronic payment system on financial inclusion in Nigeria? The specific research questions are:

i. How does internet access affect access to financial services in Nigeria?
ii. How does financial literacy affect access to financial services in Nigeria?
iii. How does change in technology affect financial services in Nigeria?

1.5 Research Hypotheses

i. H_O1: Internet access does not have significant effect on access to financial services in Nigeria.

ii. H_O2: Financial literacy does not have significant effect on access to financial services in Nigeria.

iii. H_O3: Changes in technology does not have significant effect on access to financial services in Nigeria.

1.6 Significance of the Study

This work is expected to be of immense significance to the following persons or institutions:

Private investors: The study will assist private investors to make an informed investment decision based on a full understanding of contribution of electronic payment system on financial inclusion in Nigeria.

Government: The study will aid government in the formulation of appropriate policies and laws that can help support enhancement of financial inclusion in Nigeria.

Finance professionals: They will have a better understanding of relationships between e-payment system and financial inclusion.

Academics: The study will contribute to the development and enrichment of the literature on effect of e-payment system and financial inclusion. This study will pave the way for more research into various facets of this vital topic as it pertains to Nigeria. It will also act as a guide and source of information for other scholars working on similar or related topics. The study is hoped to generate new interest

among scholars, finance practitioners and students of research in understanding the role of e-payment system and financial inclusion. This research is likely to help to a better knowledge of electronic payment systems around the world. Finally, the findings of this study are hoped to make valuable contributions to knowledge in the field of Finance in Nigeria and the world at large.

1.7 Scope of the Study

The study will focus on a developing country like Nigeria and role of financial technology in providing financial services to the unbanked population. Specifically, it is targeted towards determining how internet access affects access to financial services in Nigeria; ascertaining the effect of financial literacy on access to financial services in Nigeria; and ascertaining how changes in technology affects financial services in Nigeria. The study will rely on data from Central Bank of Nigeria, World Bank, Nigeria Bureau of Statistics within a five-year period of 2015 to 2019.

1.8 Operational Definition of Terms

For the study, the following definitions are important:

i. **Information Innovation (IT**): This relates to the computerization of processes, controls, and data creation utilizing PCs, telecommunications, programming and subordinate hardware, for example, automated teller machine and debit cards. IT financial institutions by facilitating enquiry, saving time, and further supporting service delivery.

i. **E-banking**: E-banking is the provision of banking services to clients through web innovation. It likewise refers to the deployment of banking services and products over electronic and communication network directly to customers.

ii.

iii. **Electronic Payment Platform** : This refers to electronic access to financial services within a designated location

iv. **Financial Literacy**: This refers to peoples' ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions which become increasingly important to enable individual and household to cope with the ever-growing complexity of products and service in financial market

v. **Financial Inclusion:** This refers to access to financial services by the vulnerable group of people in the society especially a developing country like Nigeria.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual framework

2.1.1 Concept of Information Technology

According to Abor (2005), Information Technology impacts financial institutions by simplifying processes , saving time, and easing transactions (Yasuharu, 2003**).** It is a general term for the use of electronic technology for the information needs of businesses of all levels. Communication technology involves physical devices and software that connect different computer hardware components and send data from one physical location to another (Laudon and Laudon; 2001). ICT products used in the banking sector include ATMs, smart cards, telephone banking, MICR, electronic money transfers, electronic data interchange, electronic home banking and banking services at the office. Finding a definition that clearly explains the difference between IT and ICT is not easy. In short, the IT and ICT definitions talk about the hardware, software, and networks used to retrieve, record, and display information. Laudon and Laudon (2001) define information technology as technology that supports activities, including the creation, storage, manipulation, and transmission of information, as well as related methods, management, and applications. Yasuharu (2003) also defines computing as computer technology, telecommunications and other devices that integrate data, equipment, people, and problem solving into the planning and control of activities. business. Information technology provides the means to collect, store, encode, process, analyze, send, receive, and print text, audio or video information. These two definitions show that information technology can be considered as a wide range of technologies needed to support information systems.

These authors are trying to categorize IT as collecting, storing, and processing information. This can only be achieved using technology. A broader view of computer science is the study of systems such as computers and telecommunications for storing, retrieving, and transmitting information (Yasuharu, 2003). This definition goes deep into telecommunications, but Oliver and Chapman focus more on the methods, management, and applications used to make a difference in creating a business. The role of computers in society, and thus the role of information technology, is a major issue to consider.

Computers have special characteristics, but they are just one example of automation. IT is the primary tool commonly used in societies that rely heavily on all forms of automation and the automatic processing of information by computers. Information technology is not only the subject taught in schools, but also the methods and devices used in the management of many organizations. IT is not only about the knowledge that we have acquired, but also about using it to bring about the development of society (Daniel, 1999).

Over the past few decades, commercial banks' investments in IT have helped streamline operations, increase competitiveness, and improve the variety and quality of services offered. According to Yasuharu (2003), the implementation of information technology and telecommunications networks has revolutionized the functioning of banks and financial institutions. As a result of the Internet Revolution, the financial services industry is claimed to be facing dramatic structural changes. Others are seeing the continuation of trends that have already begun.

2.1.2 The Concept of Electronic Banking

E-Banking is the latest delivery channel for delivery banking services and products. The importance of electronic banking depends on the researcher. Daniel (1999) describes e-Banking as providing banking services to customers via Internet technology.

However, Singh and Malhotra (2004) more broadly define electronic banking as providing banking services and goods directly to customers over electronic and telecommunications networks. Products and services are provided through electronic and communication networks such as ATMs, the Internet, mobile devices, and telephones. Among these technologies, the proliferation of personal computers, relatively easy access to the Internet, and the rise of mobile phones have led most banks to focus on electronic banking services. (Boateng and Molla, 2006). On the other hand, Daniel (1999) considers e-banking as a financial innovation made possible by the creative use of emerging information and communication technologies and other business forces. Financial innovation includes ICT, customers, marketing, finance and strategy. However, the common factor to the above three definitions is the provision of services and products through media such as computers, televisions and mobile phones.

Since the 1990s , Electronic banking is the product of various generations of electronic transactions. Electronic banking has been growing. It used to be of little importance, but is now known to millions of users around the world. Automated teller machines (ATMs) may be regarded as the earliest example of electronic banking, which provides customers with electronic access to banks. Later, telephone banking was introduced, allowing users to call banks and conduct bank transactions using regular telephones. Nevertheless, telephone banking has been replaced by personal

computer (PC) banking. This banking allows customers to have their banks install their own software on their PCs and deposit them from home to the bank. This medium allows users to interact with banks via a computer connected to a telephone network equipped with a dial-up modem. Internet banking is currently the latest in several system generations. This type of electronic banking is well known in Austria, Singapore, Spain, Switzerland, South Korea, and Scandinavian countries. In these areas, about 75% of all banks offer internet banking (Nitsure, 2003). According to Daniel (1999), banks calculate the profitability of electronic banking distribution channels based on looking for other ways to reduce operating costs, as well as the revenue generated by billing customers.

Implementing e-banking ensures operational efficiency by minimizing labor costs, facilities, back office paperwork, and facility costs. Banks are also now dealing directly with customers through electronic banking, compared to the traditional physical store model where customers do business in-store. Boateng and Molla (2006) stated that a bank's profitability is determined by the bank's various electronic banking capabilities and can be seen in two aspects. The first is the use of electronic banking delivery channels when servicing customers.

In developed countries, many banks have started using ATMs and have evolved into personal computer banking. Nevertheless, this development is not seen in newly established banks in developing countries. In Africa, this development is seen in the South African banking sector (Boateng and Molla, 2006). The most commonly used electronic banking channel in Africa seems to be the use of ATMs. Slow evolution of e-banking In developing countries in Africa, global technology has not been able to quickly adapt to local needs. Prior to the adoption of global technology,

most developing countries lacked sufficient infrastructure, working capital, and human capacity to realize the benefits of electronic banking initiatives. The second is advanced banking services provided through electronic channels. New electronic banking services range from one-way information push services where customers receive information about bank products and services to information downloads. With the information download service, customers can not only download account information and forms, but also complete electronic transactions such as inter-account transfers, invoice payments, card and loan applications (Boateng and Molla, 2006).These determinants need to decide which eBanking services to serve to which customers, when and how to serve them.

2.1.3 ICT in Banking Operations

Today's business environment is highly dynamic and is changing rapidly due to innovation, awareness and customer demands. Businesses across the world, especially the financial institutions, operate in a complex and competitive environment as indicated by the changing business and highly unpredictable economic conditions. Information and Communication Technology (ICT) is at the heart of this global change curve. Nitsure (2003) argues that information systems play an important role in modern organizations, so administrators cannot ignore them. They stated that the entire cash flow of most Fortune 500 businesses is related to information systems. Irechukwu (2000) lists several banking services that have revolutionized the use of ICT, such as opening accounts, delegating customer accounts, processing and recording transactions.

Information and Communication Technology offers a self-service device (customer service machine) that allows potential customers to complete an online account

opening application. This helps customers verify their account numbers and receive instructions on when and how to receive their check books, credit and debit cards. The application of ICT implementation concepts, technologies, policies and strategies to banking services is of fundamental importance and concern to all banks and is indeed a prerequisite for all banks for domestic and global competitiveness.

ICT has a direct impact on how managers make decisions, plan and deliver products and services in the banking industry. This has really changed the way banks work around the world and the variety of innovative devices available to improve the speed and quality of business relationship and service delivery. Harold and Jeff (1995) argue that financial services companies need to change their traditional business practices to remain profitable after the 1990s. They suggested that the most significant challenge of today's financial institution is that bankers have recognized the importance of technology and failed to properly incorporate it into their strategic plans. Irechukwu (2000) highlighted that only banks that restructured their entire payment system and used ICT for their operations are likely to survive and prosper in the future. He implored banks to review their service delivery system and place them appropriately within the dynamics of information and communication technology. Nevertheless, Nigerian banking industry has gone through major changes over the last decade in connection with changes in banking technology. Striving for survival, global relevance, maintaining existing market share, and sustainable development has required taking advantage of many benefits. Utilization of ICT by using automated devices that are essential to the industry. Some authors have investigated the impact of ICT on the banking sector of the Nigerian economy. Agboola et al (2002) discussed the emerging aspects of automation in the Nigerian

banking industry. These include bankers' automatic payment services, automatic payment systems, and automatic delivery channels.

Agboola (2001) investigated the impact of computer automation on Lagos banking services and found that electronic banking significantly improved the services offered to customers by some Lagos banks. However, the survey is limited to Nigeria's Commercial Neurocenter and focuses on only six banks. He conducted a comparative analysis of new-generation banks and new-generation banks and found differences in the acceptance rates of automated devices. Aragba Akpore (1998) opined that application of information technology in Nigerian banks and pointed out that IT is becoming the backbone of updating Nigerian banking services. He cited Diamond Bank Limited's Diamond Integrated Banking Services (DIBS) and All States Bank Limited's Electronic Smart Card Account (ESCA) as efforts aimed at improving the banking sector. Ovia (2000) observed that Nigeria's banking business is increasingly dependent on the use of information technology, and that the IT budget for banking business is much larger than any other industry in Nigeria. He claimed that the online system facilitated internet banking in Nigeria. This is evidenced by the fact that some of them have launched websites. He also found that banks now offer customers the flexibility to hold an account at any branch, regardless of the branch where the account is located. Agboola et al. (2002) Banks in Nigeria have found that since the 1980s they have outperformed other industrial sectors of the economy in terms of investment profiles and the use of ICT systems. Analysis of research by Africa Development Consulting Group Co., Ltd. (ADCG) IT penetration in Nigeria is that banks are investing in IT, IT staff is increasing, PC, LAN and WAN installation bases are increasing, and connectivity to the Internet is better than in other sectors of the Nigerian economy. It shows that it is.

.

2.1.4 Concept of Financial Literacy

Lusardi and Mitchell (2013) defined financial literacy as the capacity of people to process economic data and make informed decisions about financial planning and wealth creation Fnancial literacy is the ability to read, analyze, manage, and communicate personal financial conditions. Financial literacy skills enable individuals and businesses to pass the financial world, make informed decisions about their finances, and reduce the risk of financial mistakes. (Beal and Delpachitra, 2005). Consumers of financial services have also been subjected to unethical practices by financial institutions, possibly due to their low level of financial literacy because of lack of knowledge and awareness of their rights and obligations in dealing with financial institutions. Financial education is suitable for both educated and untrained people to enable them to be financially educated. However, financial literacy can be distinguished from financial education. In an effort to improve Americans' financial literacy, the Financial Literacy Advisory Council (PACFL), in 2008, clarifies and succinctly defines financial literacy as the ability to use knowledge and skills to effectively manage financial resources during times of financial well-being. He defined financial education as the process of enhancing knowledge of financial services. Welfare. Recent technological and financial innovations in Nigeria's financial services industry such as debit card terminals, mobile money transactions, e-banking and others have made money so liquid that can easily flow point by point, hence the increasing need for financial leadership education. The failure of the financial services industry to effectively and transparently educate many of its clients has resulted in much of the damage caused by misinformation (information overload

or information scarcity). Many customers have been tricked by scammers who take advantage of this loophole and scam these ignorant customers. Sometimes these cheated and scammed clients are well educated but lack financial knowledge. The National Financial Inclusion Strategy launched on 23 October 2012 is targeted towards reducing financial exclusion rate in Nigeria from 46.3% in 2010 to 20% in 2020. A major element of the implementation process is people empowerment achieved through improved financial education and consumer protection. Financial literacy surveys in many countries, especially African countries, show that consumers lack knowledge of their financial needs. Therefore, the observation that the main obstacle to economic development is the lack of financial literacy and the inability to maximize the growing financial markets due to the continuously growing products and services offered (Faboyede, BenCaleb,). Oyewo, and Faboyede 2014). Due to the importance of financial literacy in all economies, it has received a great deal of attention from a wide range of stakeholders, including government agencies, financial authorities, banking institutions, basic consumer and community interest groups, and other institutions. These interested groups, including policy makers, We are concerned that citizens do not have sufficient knowledge of the concept of finance due to the lack of tools needed to make informed investment decisions that improve the financial well-being of citizens. The goal of these advocacy groups and institutions is to prepare for their clients and make informed financial decisions in their businesses and transactions, which increases their support and trust, especially in the banking sector. increase. However, most of these clients are not performing at their best, as some of these clients are still ignorant when it comes to making sound financial decisions in trading and banking. Some people in Nigeria are economically excluded because of lack of financial information. Financial exclusion, which aims to

reduce financial inclusion strategies to manageable minimums, can never be achieved unless financial literacy pays special attention to it. Only if the majority of Nigerian people have financial literacy will they participate in the formal financial system, recognize their opportunities, take advantage of them, be financially involved, and thereby Nigerian finance and It can contribute to economic development.

Recently, Banking industry has become more complex. People are gradually adopting financial technology. In a 2014 national baseline survey of financial literacy, customers lacked general knowledge of most banking products on the market, with 70% (98 million) of the adult population learning about mobile money products. I didn't have it, and it turned out that more than 30% had no knowledge. Handles account verification. Financial literacy not only benefits individuals, but it also benefits the health of financial service providers and the financial system. Stability of the financial sector is necessary for sustainable growth and development of financial markets in any country. Financial literacy improves the stability of the financial industry by increasing market demand and proper use of financial services. It also raises the level of savings and investment, increases the uptake of financial products and stimulates economic activity. In addition, it can reduce debt and help save the poor from crisis poverty. In Nigeria, the amount of cash outside the banking system is relatively large, and one of the causes is financial literacy. Government financial inclusion strategies can only be used significantly if more people have financial literacy. Financial literacy is important for the development and stability of the financial system as follows.

✔ Financially strong clients make better decisions about wealth management and growth and are not vulnerable to malicious financial service providers.

✔ Improved financial performance increases the use of eligible products, reduces product cancellations, debt stress, defaults and ultimately reduces the risk of financial institutions.

✔ The behaviour of wealthy customers can lead to competition between financial service providers, which can lead to more efficient products and competitive prices for consumers and eliminate malicious financial service providers.

✔ A strong financial sector and those who can manage, protect and grow assets will ultimately support overall macroeconomic stability and growth. Financial literacy is essential to a functioning financial system, which affects the economy as a whole. Low-educated people tend to have difficulty comparing financial products, using cash and in-kind payments, and understanding financial terms. High-income people, especially those who are educated, tend to have good financial literacy, while those who are not educated have only a basic knowledge of finance. Financial literacy influences economic development and plays an important role in building a sustainable financial system. This means that there is a connection between financial literacy, financial systems, institutions and economic development (ResearchClue.com website, 2013).

2.1.5 Benefits of Digital Financial Literacy

Financial literacy is defined as a combination of financial perceptions, knowledge, skills, attitudes and behaviors needed to make informed financial decisions and ultimately achieve the financial well-being of an individual. Financial literacy is also

related to financial capacity. H. The ability to use the financial literacy learned by consumers to make more informed decisions about financial management. Digital financial literacy is described as "Applying Digital and Financial Literacy to Enable the Use of Digital Financial Services."

Therefore, digital literacy straddles the concepts of digital literacy and financial literacy, but has its own dimension due to the nature of the product and the risks associated with it. In addition to basic financial literacy, digital financial literacy is becoming an increasingly important aspect of education in the digital age. The proliferation of mobile and other digital financial products, the continued expansion of digital financial services, and the "gigs" where individuals are more responsible for their financial plans (eg, managing their retirement and retirement plans). Economic Development There is an urgent need for consumers to have a higher level of financial understanding in order to effectively use the products and services of financial technology (fintech) and avoid fraud and costly mistakes. In addition, digital financial literacy is increasingly being seen as an important factor in addressing the limited use of digital financial services by women. These developments show the need to develop digital finance education programs to improve digital finance literacy, focusing on the key skills needed to participate in the digital economy.

2.1.6 Concept of Financial Inclusion

The Raghuram Commission (2003) in India refers to financial inclusion as the process of ensuring access to financial services by vulnerable groups such as the weakest sections and low-income groups. at a reasonable cost. This definition clearly identifies the goal of financial inclusion on vulnerable segments of society. It also shows the ease of access to credit. Akingbola (2006) defined financial

inclusion as the extension of banking benefits to the poor. The study highlighted that banks will offer a basic account to anyone who wants one. The concept of financial inclusion explains how the financially excluded, unbanked and under banked in society can access and use quality and affordable financial products and services. Overall, Ene (2019) described financial inclusion as the provision of basic banking services at an affordable cost to all sections of society, especially large groups of people from disadvantaged backgrounds. Financial inclusion requires attention to human and institutional issues, such as quality of access, affordability of products, sustainability of suppliers, and accessibility of resources. group of people. the most excluded population. Thus, financial inclusion can be defined as the capacity to make financial services available to all in a fair, transparent and equitable manner at a reasonable cost. Financial inclusion is widely seen as the right of all citizens to social inclusion, to a better quality of life, and as a tool for building the capacity and economic viability of the poor in a country.

2.1.7 Factors that Advance Monetary Incorporation in Nigeria

2.1.7.1 Fintech

Fintech, or financial technology, refers to new or existing technology or innovation that replaces traditional methods of financial transactions. Fintech introduces a new way of financial transactions with minimal human interaction. Nigeria witnessed a boom in fintech activities in 2015 and this became possible due to the increased number of mobile users across the country. Fintech, enabled through mobile phones has enabled Nigerians to make purchases from online stores, make payment using mobile apps, manage personal finances; thus encouraging a large number of people towards the financial sector to take advantage of these

innovations. In addition, start-ups have been able to implement new business models that require business owners to work remotely using fintech and save on physical office rental costs. Also, through web-based transactions f, financial regulators can monitor all financial transactions to ensure transparency, fairness, and detect related suspicious activities that are related to fraud and other crimes..

2.1.7.2 Digital finance: USSD codes, Electronic Cards and Mobile Bank Apps

PWC 2017 Fintech survey report shows that more than 62% of bank customers will use mobile apps to access financial services in the next 5 years in Nigeria. The introduction of USSD codes in Nigeria allows customers to perform a huge range of financial transactions from their phones using USSD codes. USSD code is a communication technology that sends a request to a banking system interface on behalf of a customer in the hope that the bank will approve the request when providing the correct access code or password. E-cards have also surfaced in Nigeria since 2015 and continue to gain popularity and evolve over time into wider card products such as ATMs, dollar cards, etc. Also, debit cards are popularly used in Nigeria. Mobile banking applications are also used by banking customers to remotely access their bank accounts and authorize financial transactions from one party to another. These digital financial products have supported financial inclusion in Nigeria.

2.1.7.3 Authority to Reject or Accept Financial Innovation by the Financial Regulator

Another factor that has promoted financial inclusion in Nigeria is the power of the financial sector regulator to accept or reject the financial innovations operating in

Nigeria. The financial regulator, the Central Bank of Nigeria (CBN), is independent and has the sole power to refuse or grant a company's application to introduce financial innovation into the Nigerian financial sector. CBN receives and evaluates all applications by domestic and foreign companies seeking to introduce new financial technology or new financial products and services in the Nigerian financial market. Ideally, CBN would invite innovation promoters to a town hall meeting, to ensure that CBN have strong knowledge of what the technology wants to achieve and the risks involved. The CBN is expected to assess whether the new innovation poses a risk and whether the registrar can manage risks internally and whether the innovation increases systemic risk for the entire financial system.

On these bases, the CBN will make an acceptance and rejection decision. It is therefore the duty of those who promote certain financial innovations in Nigeria to clearly explain what the new technology is expected to achieve, the benefits and the associated risks. Finally, it is important to note that all financial innovations that are capable of improving financial inclusion in the country and do not pose significant risks to the financial system stand a chance of being approved by the CBN.

2.2 Theoretical framework

Various theories have been used by researchers to explain financial inclusion. Some of these theories are technology acceptance theory, financial innovation theory, and innovation spillover theory. These are discussed in the subsections below.

2.2.1 Technology Acceptance Model

This model was initially proposed by Davis (1986) to show the perceptions behind the intention to use technological know-how (Monyoncho, 2015). TAM addresses

the mind-set behind and not the actual use of systems and argues that when new technological advances are introduced to customers Perceived Ease of Use. (PEOU) and Perceived Usefulness (PU) influence their decisions (Lule, Omwansa and Waema, 2012). PEOU refers to the level of trust people place in a system, and if users find a new technology beneficial in the short and long term, they will be motivated to use that system. Also , the extent to which an individual thinks the system will increase performance in the short and long term is PU (Mojtahed, Nunes and Peng, 2011). TAM states that actual use of the system is established by each user's behavioural intention to use and is motivated by the individual's perception of the system. The theory also explains that the perception towards new technology is related to its functionality as well as the simple nature of the system (Lim and Ting, 2012).

TAM explains the reasons why clients acknowledge or dismiss an advancement or data framework. TAM is relevant to both as a prescient strategy, considering the objective to evaluate the probability of individuals and associations to take delivery of a specific innovation (Mojtahed, Nunes and Peng, 2011). TAM can be used to explain the digital financial services which can be applied in clarifying the existence of variations in consumer behaviours especially when it comes to use of related digital financial services (Lim and Ting, 2012) The theory is a direct adaptation of the Reasoned Action Theory specifically tailored for modelling user acceptance of information systems.

2.2.2 Diffusion of Innovation Theory

Diffusion of Innovation Theory (DOI) was developed by Rogers (1995) to explain the different approaches by which technology or innovation can be communicated over a period of time among different users (Sarker and Sahay, 2004). DOI theory highlights the ways in which innovative ideas are passed from generation to generation. According to DOI theory, an innovation is continuously communicated through various channels between people with the same social and cultural beliefs (Echchab and Hassanuddeen, (2013) DOI theory considers innovations transmitted in many ways over a period of time as well as a given system (Sarker and Sahay, 2004) . DOI theory attempts to provide explanation and illustrate the various approaches in which digital financial services innovations are adopted and successful applied. DOI considers the following attributes of innovation :

✔ Availability: This refers to the level of which an innovation can be used on a limited basis.

✔ Complexity: This is the degree to which an innovation is considered relatively complicated and difficult to use.

✔ Relative advantage: This refers to the degree to which an innovation is seen as better than the old idea.

✔ Compatibility: This entails the degree to which an innovation is deemed to be in alignment with existing values, past experiences, and the needs of prospective users.

✔ Observability: This involves the results of an innovation that are visible to other people. Out of these attributes, only relative advantage, compatibility, and complexity are systematically linked to innovation adoption (Cheu et al., 2000).

Rogers reviewed nearly 1,500 studies in which variations of IDT were used to study the adoption of technological innovations in a variety of contexts, including agriculture, health care, urban planning, and agriculture. A smaller research group focused on how these attributes influence usage intention and behaviour. Rogers developed his IDT constructs by identifying the product attributes that most influenced adoption. As Nigeria is a developing country facing some challenges related to technology adoption, the rigorous explanatory theoretical framework for this study is the theory of technology acceptance and thus the theories underpin this research trend.

2.2.3 Financial Innovation Theory

Financial innovation refers to the process of creating or modifying existing financial and investment products, processes or services. Li and Zeng (2010) believe that financial innovations are based on the idea that the expansion of money-related platforms in favor of the expansion of money-related platforms is the main reason for financial inclusion. . Indeed, given the similarity of financial services offered by financial services and investment firms, innovations aimed at promoting a value-added brand became the basis for the preference of one product or service over another. Sekhar (2013) considers financial innovation as the main driver of the financial system, leading to better economic capacity and increased economic benefits derived from new and frequent changes. Financial innovation enhances

financial market liquidity; allocates resources to underserved areas as well as improve access to business opportunities (Blach, 2011).

Generally, the theory anticipates new and optimal ways of production, technological solutions and enhancing overall business profitability. Financial Innovation often leads to greater economic efficiency because of the tendency of improved knowledge of optimal utilisation of service channels and other financial management methods.

Thus, there are five key financial innovations practices that stand out, namely improved technology, risk management, risk transfers, credit and equity generation and overall innovations. Crowd funding, mobile banking application technology and fund remittance technology rank amongst the well-known innovations in the financial services industry. Innovation can also be institutional, product or processes often resulting from increased volatility of interest rates, inflationary pressures, and vicissitudes in stock prices and the constant fluctuation of foreign exchange rates..

2.3 Empirical Review

2.3.1 Effect of Internet Access on Access to Financial Services in Nigeria

Bayar, Gavriletea and Paun (2021) applied empirical evidence from post-communist EU countries to study the effect of mobile phone and internet usage on financial inclusion. They collected sample data of 11 post-Communist European Union countries from 1996 to 2017 using a panel analysis of cointegration and causality. First, they investigated whether the number of mobile phone contracts and Internet usage rates affect the access of financial institutions. They also analysed the effect

of these variables on access to financial markets. The results show that mobile banking have a positive effect on access to financial institutions in countries such as Hungary, Latvia, Lithuania, Poland and Slovenia, as well as access to financial markets in Bulgaria, Croatia and Hungary rice field. In addition, there was a negative link between mobile phone contracts and access to financial institutions in the Czech Republic, and a link between access to financial markets in the Czech Republic and Poland. The results also show that there is a positive and negative relationship between Internet usage and access to financial institutions and financial markets. The study conclude that there is a direct relationship between internet usage and financial institutions in Bulgaria, Croatia, the Czech Republic, Hungary and Poland, and improve access to financial markets in Latvia and Slovenia. Also Khatoon and Ahmed (2019) investigated the effect of internet connectivity on financial inclusion in Asian and African countries by creating a panel of 39 countries in Asia and Africa.

The link between financial inclusion (FI) and the use of the Internet was determined to determine the link between economic growth and financial inclusion. The financial inclusion index and economic growth were used as dependent variables by taking the time from 2004 to 2017 using GMM's econometric method. The results show that the financial inclusion index has a positive correlation with Internet users and economic growth, as well as a significant and positive correlation with financial inclusion.

The authors concluded that as the use of the Internet in the economy increases, so does financial inclusion, as shown in the case of Asian and African countries. The author has provided some impact on policies to create an environment that leads to improved FI. Barik and Lenka (2018) used data from 2004 to 2014 to examine the

link between mobile phone growth and Internet use in FIs in SAARC countries. In this study, we applied random effects, fixed effects, and standard error model techniques to analyze the results. This study shows that FI had a positive link between education and income, while FI had a negative link between unemployment and rural population. The authors have found that mobile banking is safer, easier, and more compelling. Electronic financial services have also increased the banking business of our customers.

Another study that was conducted by Michael (2018) examined the relationship between internet penetration and financial inclusion in Nigeria. Frequencies, percentages and tables were used to present data while obtained data was tested for empirical evidence using twostaged regression analysis in Eviews 10. Findings revealed that internet penetration has significant impact on financial inclusion in Nigeria within the period under review. It was recommended that there was need for the adoption of highly internet based transactional policies that will ensure that the financially excluded is reached easily. The study of Sreedevi & Meena (2011) also buttressed that the existence of ICT in the banking industry provided numerous advantages such as easy access to banking products and services, insurance services, financial education, adequate credit, and financial information or consultation. In addition, internet and mobile banking services play an important role in building a country's inclusive financial system. It is clear that the widespread use of the Internet is driving economic growth through financial inclusion. According to Andrianaivo and Kpodar (2012), mobile phone penetration positively affects economic growth. Furthermore, the relationship between mobile penetration rate and financial inclusion is positive and significant.

Further, Mago and Chitokwindo (2014) conducted a qualitative survey in Masvingo District in Zimbabwe and found that economically disadvantaged people in Zimbabwe adopted mobile banking services because of their ease of use. accessible, fast, cheap and guaranteed. In a related study, using the General Momentum Method (GMM), Kpodar and Andrianaivo (2011) found that mobile phone deployment significantly promotes economic growth in Africa, because it promotes financial inclusion. The growth of digital financial services in most regions of Africa supports growth both at the national level as well as at the corporate level, supporting a proposition that growth can be achieved. sustainability through greater financial inclusion. Current research shows that deepening technology deepens financial processes and ultimately leads to inclusivity. Furthermore, researchers suggest that Internet and mobile phone use establish a good social network between individuals and with evidence from empirical research, Aker & Mbiti, (2010) have determined that The use of the Internet and mobile phones can benefit consumers as well as producers. Consumers can know the exact price of a product by comparing all prices, and producers can trade in new markets and create new business networks.

In line with the above, Ouma et al (2017) conducted a study in a selected number of countries in sub-Saharan Africa and found that the use of mobile phones increases savings of poor and low-income households. This increase in savings and deposits is an indication of increasing financial inclusion, which ultimately has a positive impact on the country's financial health. Iwedi, Kocha and Wike (2022) studied the effects of digitization of banking services on the Nigerian economy. 12-year annual aggregate data on digital banking, provided by the Central Bank of Nigeria Statistical Bulletin, were used in this study, while multiple regression was used. to determine

the importance of the relationship between digital banking channels and economic performance in Nigeria. The results show that web payments and mobile payments both show a strong relationship with Nigeria's economic growth. This therefore implies that the digitization of banking channels is strongly and significantly associated with economic growth in Nigeria. The authors conclude that Nigerian customers are adopting digital banking methods. The authors recommend that banks can continue to raise awareness of the different digital platforms that customers can explore. In addition, he also recommended banks to encourage consumers to use digital payment facilities, including Remita, mCash, Ebills pay and NIBSS automatic payment services.

Research by Beuermann, McKelvey and Vakis (2012) in rural areas of Peru shows that expanding mobile phone coverage reduces extreme poverty. Asongu (2015) reports a negative relationship between mobile penetration and income inequality in a sample of 52 African countries. In a similar study by Asongu and Le Roux (2017), they found that mobile, internet and broadband penetration had a positive impact on inclusive growth, as measured by the Development Index. people are adjusted for inequality. Gosavi (2018) in his research found that mobile money has a positive impact on the financial inclusion of SMEs, through its impact on increasing accessibility. bank credit. Based on the findings of Abor, Amidu and Issahaku (2018), the authors conclude that mobile phone ownership reduces the likelihood of a household falling into poverty in Ghana.

Asongu and Odhiambo (2019) found a negative relationship between mobile, internet and broadband penetration and inequality in a panel of 48 African countries. National studies provide further evidence of the positive development outcomes of

information and communication technology (ICT). Fernandes, Borges and Caiado (2021) studied the contribution of digital financial services to financial inclusion in Mozambique using an Automated Distributed Latency (ARDL) model, in the range of period from January 2011 to September 2019. The study used two models to analyze the contribution of digital financial services to financial inclusion as measured by the number of bank accounts in Mozambique. . The first model uses traditional digital payment facilities as independent variables, such as financial transaction volume through automated teller machines (ATMs), point of sale (POS), interbank and interbank electronic money transfers, direct debit, domestic and cross-border remittances.

The second model is considered innovative digital payment means, such as online banking, mobile banking and crypto currency. The authors conclude that by excluding domestic remittances and direct debit, which has low domestic penetration, and internet banking, the remaining variables contribute to financial inclusion. The results confirmed the important role of digital financial services in financial inclusion, especially in improving the accessibility and utilization of services by the underserved. Adeoye and Alenoghena (2019) studied the relationship between internet usage, financial inclusion and economic growth in Nigeria between 1999 and 2016, using time series data for this period, the study using Engle Granger's cointegration test and fully modified ordinary least squares (FMOLS) for analysis. The results show that widespread use of the Internet and money has a positive and significant impact on financial inclusion. Furthermore, Internet usage has a positive and significant impact on economic growth in Nigeria. However, the impact of financial inclusion on economic growth is negative, minimal and insignificant. Furthermore, the impact of the interaction coefficient of Internet use and

financial inclusion on economic growth is positive, small, and insignificant. Therefore, the positive impact of Internet use on economic growth in Nigeria is not conveyed through the financial inclusion mechanism.

2.3.2 Effect of Financial Literacy on Access to Financial Services in Nigeria

A study by Mwangi and Evelyne (2012) used data from the 2009 National Financial Access (FinAccess) survey to determine the impact of financial literacy on access to financial services in Kenya. They used multinomial logistic approach to describe access to the four major domains. The regression results show that household access to financial services is not based on financial literacy levels, but on factors such as income level, distance from banks, age, marital status, gender, household size, and education level. The study also found that people without financial literacy are very likely to remain financially excluded, and that more investment in financial literacy programs is needed to reverse this trend. The study also highlights the importance of developing a financial education curriculum and managing it in rural, secondary and higher education institutions.

Twumasi, Jiang, Wang, ding, Frempong & Acheampong (2022) examined the determinants of financial literacy (FL) and its impact on access to financial services (AFS), using data collected from rural Ghana. A two stage residual inclusion model was used to address the selection bias issue. The results showed that FL was affected by household heads` age, gender, education, asset ownership, homeownership, and economics education. The results revealed that FL was significant and positively related to AFS, but its square shows an inverse relation with saving mobilization. This indicated a nonlinear relationship between FL and AFS. The authors found that FL has a larger AFS impact for households with

highincome and male household heads relative to their counterparts. The study recommended that the government can initiate the creation of a rural committee to educate rural residents on financial issues through radio broadcasting and meetings. The authors highlighted the importance of FL on AFS in enhancing the welfare of rural households. In a similar study which was carried out by Okere, Mbanasor, and Uzokwe (2020), the authors assessed the relevance of financial literacy in financial sector development and stability in Nigeria. The study theoretically evaluated the relevance of financial literacy in stability and development of financial sector in Nigeria with more reference to the deposit money banks. The author argued that financial literacy is a set of skills and knowledge that enables a person to make informed and effective decisions using all financial resources. According to the literature, financial education promotes the stability of the financial system by increasing market demand, using financial services fairly, improving savings culture and financial discipline, and stimulating economic activity. Financial literacy is essential to a functioning financial system, which has a positive impact on the economy as a whole. Lack of financial literacy is the main reason for keeping people away from financial markets.

2.3.3 Effect of Changes in Technology on Access to Financial Services in Nigeria

Kwadwo, Kwadwo & Matilda (2019) used both exploratory and descriptive research designs to investigate the contribution of information and communication technology (ICT) to bank performance related to service delivery at financial institutions in Ghana. Data collection was performed using a structured survey from a sample size

of 50 respondents consisting of 8 employees and 48 customers at Barclays Bank used in the survey. Studies show that ICT has a significant positive impact on performance as it improves customer service delivery and impacts Barclays Bank's growth. ATM service vulnerabilities such as Withdrawal mismatch, card issuance error, and waiting for the inserted ATM card to arrive for a long time will make the service unavailable to most customers. Barclays Bank was recommended to improve ATM and network performance to increase customer satisfaction.

A study by Okonkwo, Obinozie and Echekoba (2015) used 11 intentionally selected commercial banks in Nigeria to investigate the impact of information and communications technology and financial innovation on the performance of Nigerian commercial banks. This study used annual bank data from 2001 to 2013 and the Central Bank of Nigeria factbook. We used a regular Small Square (OLS) to assess the impact of electronic banking services and ATMs on the performance of commercial banks in Nigeria. The results of the survey show that as banks' profitability performance improves, so does the return on equity (ROE) of commercial banks. It has also been shown that investing in electronic banking services and ATMs does not actually improve bank performance. The author recommended that more emphasis be placed on corporate governance and policies that promote the proper and efficient use of financial innovation devices, rather than simply making additional investments. Ibikunle and James (2012) investigated how the adoption of information technology affects commercial banking operations in terms of effectiveness, efficiency, competitiveness, customer base, and banking globalization. The research method included reviewing the existing network design of the banks under investigation and comparing it with the proposed network design solution. The results of work design and simulation show that information technology has improved

customer satisfaction, operational efficiency, transaction time reduction, competitive advantage, operational cost reduction, and quick response to service delivery. Is shown.

Christopher, Mike, and Amy (2006) analyzed the impact of the availability of financial technology facilities on the choice of banking institutions for banking customers. The author conducted a survey of 477 banking customers in 33 organizations in Ekiti, Nigeria. The study found that the availability of financial technology facilities such as ATMs, Internet banking, and telephone banking did not significantly influence a customer's banking decisions. Mago and Chitokwindo (2014) investigated the impact of financial technology on Zimbabwe's financial inclusion, focusing on mobile banking in Masvingo Province. This survey used qualitative survey methods and survey designs. They argued that electronic banking had a major impact on Zimbabwe's financial inclusion. Their results show that low-income people were willing to adopt mobile banking and thereby improve financial inclusion..

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Justification

The research intends to explain relationship between variables. In this case, it examines the relationship between internet access, financial literacy , change in technology and financial inclusion. Hence expo facto research method is adopted. To ensure objectivity, secondary data is used to measure the variables. Data is collected from 2008 to 2021. This is a time series data.

3.2 Research Design

The researcher adopted *ex-post facto* research design. The decision of the ex-post facto plan is on the grounds that the examination depended on currently recorded occasions, and scientists don't have command over the important reliant and free factors they are considering with the end goal of controlling them (Onwumere, 2009).

3.3 Area of the Study

This research is on the effect of electronic payment systems on financial inclusion in Nigeria from 2008 to 2021. The choice of 2008 to 2021 for this study was to improve and advance the knowledge obtained from previous studies which used later years (Barik and Lenka, 2018; Andrianaivo and Kpodar, 2012, amongst others). Internet access, financial literacy and changes in technology were used to measure the independent variables (electronic payment systems) while access to financial services was used to measure the dependent variable (financial inclusion).

3.4 Sources of Data

This study made use of secondary data sourced from central bank of Nigeria e-payments statistics as well as from annual report of central bank of Nigeria financial inclusion strategy implementation in 2021. This was due to the fact that the annual report is the main medium through which companies make their financial disclosures as to determine their performance at a particular period. Also, annual reports are readily available, accessible and regularly produced.

3.5 Population of the Study

The population of study comprised all the states in Nigeria. There is a total of thirty-six states in Nigeria and the federal capital territory Abuja as at the period of this study. The list of states in Nigeria, data on internet access, financial literacy and changes in technology as well as data on access to financial services in each of the states in Nigeria as identified in this study are shown in Appendix I.

3.6 Model Specification

The model of the study established the effect of electronic payment systems (measured by internet access, financial literacy and changes in technology) on financial inclusion (measured by access to financial services) in Nigeria in 2021. The first objective will be evaluated with the following models:

IAC = F (AFS) …………………………………………………………………………(1)

Where:

IAC = Internet access

AFS = Access to financial services

In a linear regression form, it will become:

$IAC_{it} = \beta o + \beta_1 AFS_{it} + \mu$ ………………………………………………………………..(2)

Where:

βo = Constant Term

β_1 = Coefficient of AFS

μ = Error Term

The second objective will be evaluated with the following models:

FIL = F (AFS) …………………………………………………………………………(3)

Where:

FIL = Financial literacy

AFS = Access to financial services

In a linear regression form, it will become:

$FIL_{it} = \beta o + \beta_1 AFS_{it} + \mu$ ……..(4)

Where:

βo = Constant Term

β_1 = Coefficient of AFS

μ = Error Term

The third objective will be evaluated with the following models:

CIT = F (AFS) ……(5)

Where:

CIT = Changes in technology

AFS = Access to financial services

In a linear regression form, it will become:

$CIT_{it} = \beta o + \beta_1 AFS_{it} + \mu$ ……..(6)

Where:

βo = Constant Term

β_1 = Coefficient of AFS

μ = Error Term

3.7 Description of Variables

Dependent Variable

Access to financial services: This refers to number of people who have access to financial services or products in Nigeria regardless of their locations. It will be measured by the total number of people who have an active bank account in Nigeria.

Independent Variable:

Internet access: This refers to number of people who have access to the use of internet in Nigeria. It will be measured by the total number of individuals in Nigeria who use the internet as obtained from the Central Bank of Nigeria Annual Statistical report.

Financial literacy: This refers to the number of individuals in Nigeria who have knowledge regarding access to financial services at lower cost.

Changes in technology: This refers to the use of appropriate software for servicing customers through various delivery channels. It will be measured as the total number of people who are using mobile banking in Nigeria.

3.8 Analytical Procedure

After the collection of needed and relevant data, the researcher used the Ordinary least square regression model to analyse the data with the aid of Statistical Package for Social Sciences (SPSS) version 23.0 at 5% level of significance. The results were presented using tables to give a clear picture of the research findings.

3.9 Decision Rule

Reject the null hypothesis if P-value is less than 0.05. Otherwise, accept the null hypothesis.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSES

4.0 Introduction

The main purpose of this research was to determine the effect of electronic payment systems on financial inclusion in Nigeria from 2008 to 2021. In this chapter, therefore, the disaggregated data that was collected was presented and analysed. Test of research hypotheses were performed with the aim of providing empirical evidence to answer the research questions earlier stated in the study. These analyses were carried out with the aid of Statistical Package for Social Sciences (SPSS version 23.0).

4.1 Data Presentation

Table 4.1: Descriptive Statistics of the Variables

	AFS	IAC	FIL	CIT
Mean	793416.21	1560082.74	780590.76	1344580.98
Std. deviation	3868783.668	5691771.29	3506000.41	7060118.03
Range	104378082	93888506	76500000	338024794
Minimum	21917	230493	0	75205
Maximum	104400000	94119000	76500000	338100000
Observations	5110	5110	5110	5110

AFS –Access to financial services; IAC –Internet access; FIL –Financial literacy and CIT –Changes in technology

Source: SPSS Analysis, 2021.

With the aid of SPSS, the researcher used 5,110 disaggregated data points for the variables to compute the mean, standard deviation and range which formed the descriptive statistics for the dependent variable and the independent variables (see appendix 1). The result shows that the mean of access to financial services was 793416.21 with a variability of 793416.21 as seen in the standard deviation. It indicates that data on access to financial services (financial product) in Nigeria were relatively varied. In a similar vein, the mean of internet access, financial literacy and change in technology (mobile banking) was 1560082.74, 780590.76 and 1344580.98 respectively. In addition, they also had a wide variability of 5691771.29, 3506000.41, and 7060118.03 respectively as seen in their standard deviation.

4.2 Test of the Research Hypotheses

4.2.1 Test Results for Hypothesis 1

H_0: Internet access does not have significant effect on access to financial services in Nigeria.

H_1: Internet access has a significant effect on access to financial services in Nigeria.

Table 4.2: Model Summary for Hypothesis 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.509[a]	.259	.258	6079504.71	.259	1782.067	1	5108	.000

a. Predictors: (Constant), Internet access

b. Dependent Variable: Financial product

Table 4.3: ANOVA Result for Hypothesis 1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.5866E16	1	6.5866E16	1782.066725	.000[b]
	Residual	1.8879E17	5108	3.696E13		
	Total	2.5466E17	21			

a. Dependent Variable: Financial product

b. Predictors: (Constant), Internet access

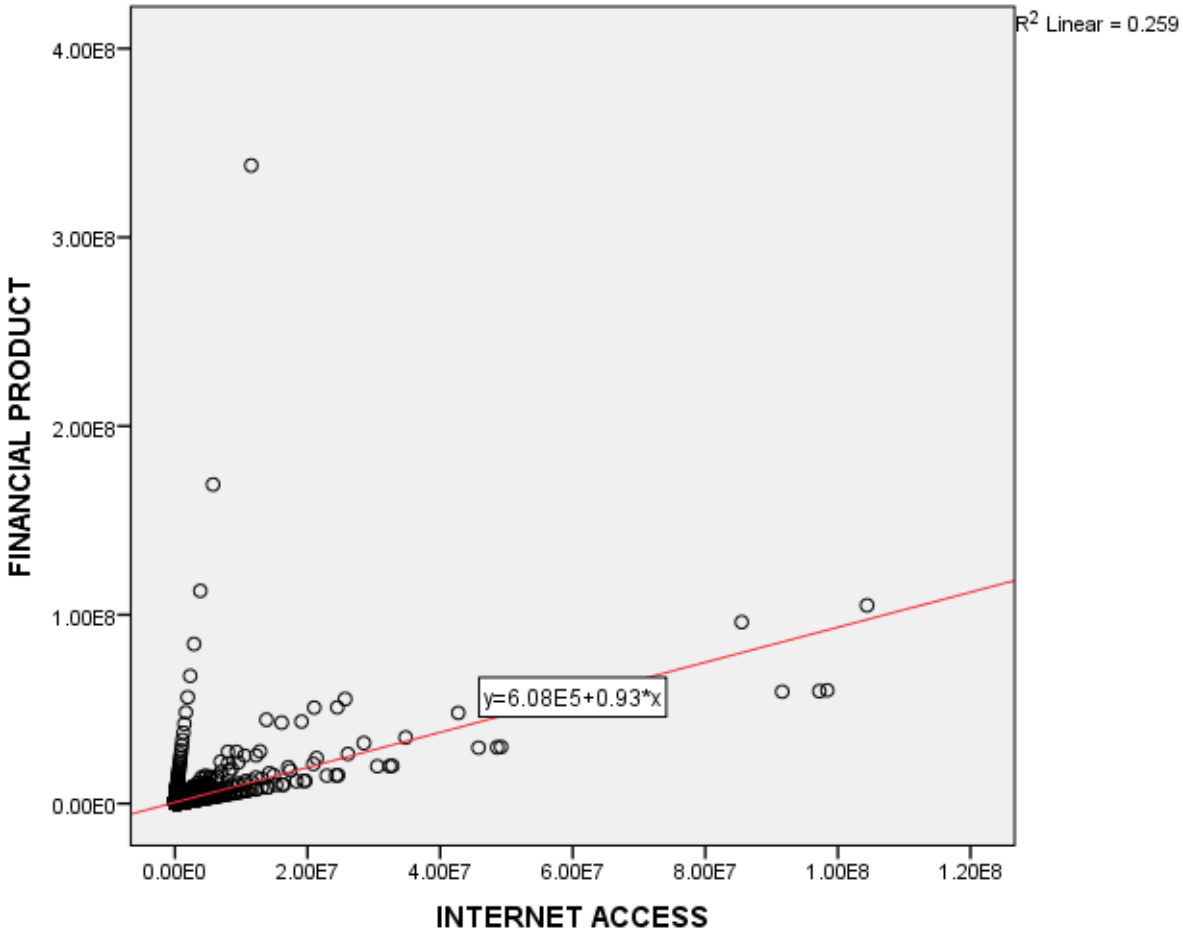
Table 4.4: Coefficients Result for Hypothesis 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	608223.256052	86817.145826		7.005796	.000
	Internet access	0.928085	0.021985	.509	42.214532	.000

a. Dependent Variable: Financial product

The results on Tables 4.2 – 4.4 above provided an investigation into the overall significance of the model. The value of R (regression coefficient) was 0.509, implying that there was a strong relationship between internet access and access to financial services in Nigeria. The R-square indicates that about 25.9% variation in the endogenous variable (access to financial services) can be explained by the exogenous variable (internet access) while 74.1% is accounted for by other factors aside internet access (IAC). In addition, the estimated value of the regression coefficient (β) is 0.928. This shows that internet access has a significant positive contribution on access to financial services in Nigeria. That is, a relative increase in internet access will result in about 92.8% increase in access to financial services in Nigeria. This impact is high and significant.

To test for the significance of the independent variable, the probability value of the independent variable (IAC), that is, 0.000 indicates that internet access has a significant effect on access to financial services in Nigeria (i.e. p-value is less than 0.05 or 5% critical value). Thus, we accept the alternate hypothesis (H_1) and conclude that there was a positive impact of internet access on access to financial services in Nigeria. The result, thus, suggests that internet access has a significant effect on access to financial services in Nigeria. This effect is shown in the regression line below.



The linear regression equation for this model is shown on the line as:

Y = 608223 + 0.93*x

which means that:

Financial product* = 608223 + *0.93internet access

4.2.2 Test Results for Hypothesis 2

H_0: Financial literacy does not have significant effect on access to financial services in Nigeria

H_1: Financial literacy has significant effect on access to financial services in Nigeria.

Table 4.5: Model Summary for Hypothesis 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.690[a]	.475	.475	5113725.525320	.475	4630.34	1	5108	.000

a. Predictors: (Constant), Financial literacy

b. Dependent Variable: Financial product

Table 4.6: ANOVA Result for Hypothesis 2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.2108E17	1	1.2108E17	4630.341	.000[b]
	Residual	1.3358E17	5108	2.615E13		
	Total	2.5466E17	5109			

a. Dependent Variable: Financial product

b. Predictors: (Constant), Financial literacy

Table 4.7: Coefficients Result for Hypothesis 2

Model	Unstandardized Coefficients	Standardized	t	Sig.

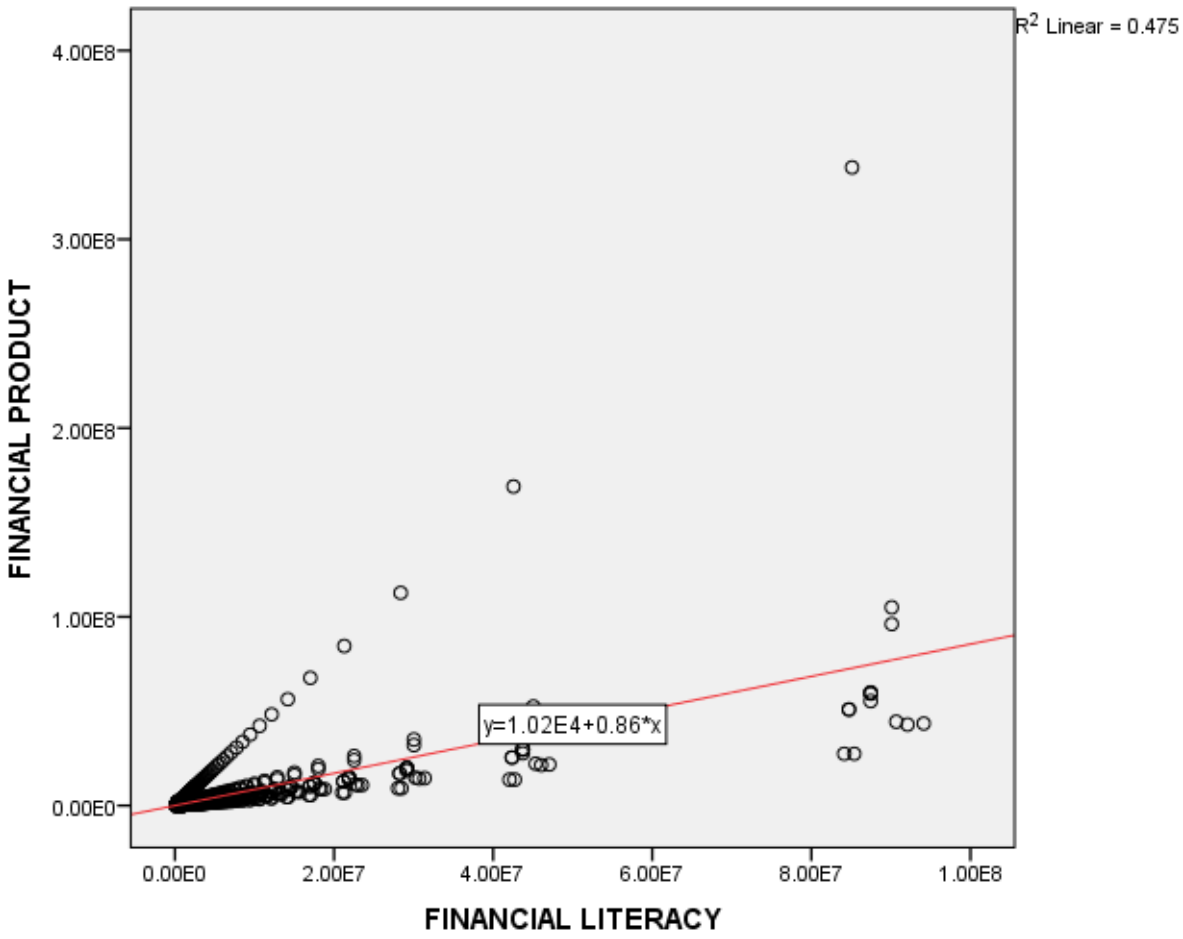
			Coefficients		
	B	Std. Error	Beta		
1 (Constant)	10211.312915	74175.412417		0.137664	.0891
Financial literacy	0.855320	0.012570	.690	68.046612	.000

a. Dependent Variable: Financial product

The results on Tables 4.5 – 4.7 above provided an investigation into the overall significance of the model. The value of R (regression coefficient) was 0.690, implying that there was a strong relationship between financial literacy and access to financial services in Nigeria. The R-square indicates that about 47.5% variation in the endogenous variable (access to financial services) can be explained by the exogenous variable (financial literacy) while 52.5% was accounted for by other factors aside financial literacy (FIL). In addition, the estimated value of the regression coefficient (β) was 0.855. This shows that financial literacy has a significant positive contribution on access to financial services in Nigeria. That is, a relative increase in financial literacy will result in about 85.5% increase in access to financial services in Nigeria. This impact is high and significant.

To test for the significance of the independent variable, the probability value of the independent variable (FIL), that is, 0.000 indicates that financial literacy has a significant effect on access to financial services in Nigeria (i.e. p-value is less than 0.05 or 5% critical value). Thus, we accept the alternate hypothesis (H_1) and conclude that there was a positive impact of financial literacy on access to financial services in Nigeria. The result, thus, suggests that financial literacy has significant

effect on access to financial services in Nigeria. This effect is shown in the regression line below.



The linear regression equation for this model is shown on the line as:

Y = 10211 + 0.86*x

which means that:

Financial product = 10211 + 0.86financial literacy

4.2.3 Test Results for Hypothesis 3

H_0: Changes in technology does not have any significant effect on access to financial services in Nigeria

H_1: Changes in technology have any significant effect on access to financial services in Nigeria

Table 4.8: Model Summary for Hypothesis 3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.500[a]	.250	.250	6113383.108152	.250	1705.913261	1	5108	.000

a. Predictors: (Constant), Mobile banking

b. Dependent Variable: Financial product

Table 4.9: ANOVA Result for Hypothesis 3

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.3756E16	1	6.3756E16	1705.913261	.000[b]
	Residual	1.909E17	5108	3.7373E13		
	Total	2.5466E17	5109			

a. Dependent Variable: Account ownership

b. Predictors: (Constant), Mobile banking

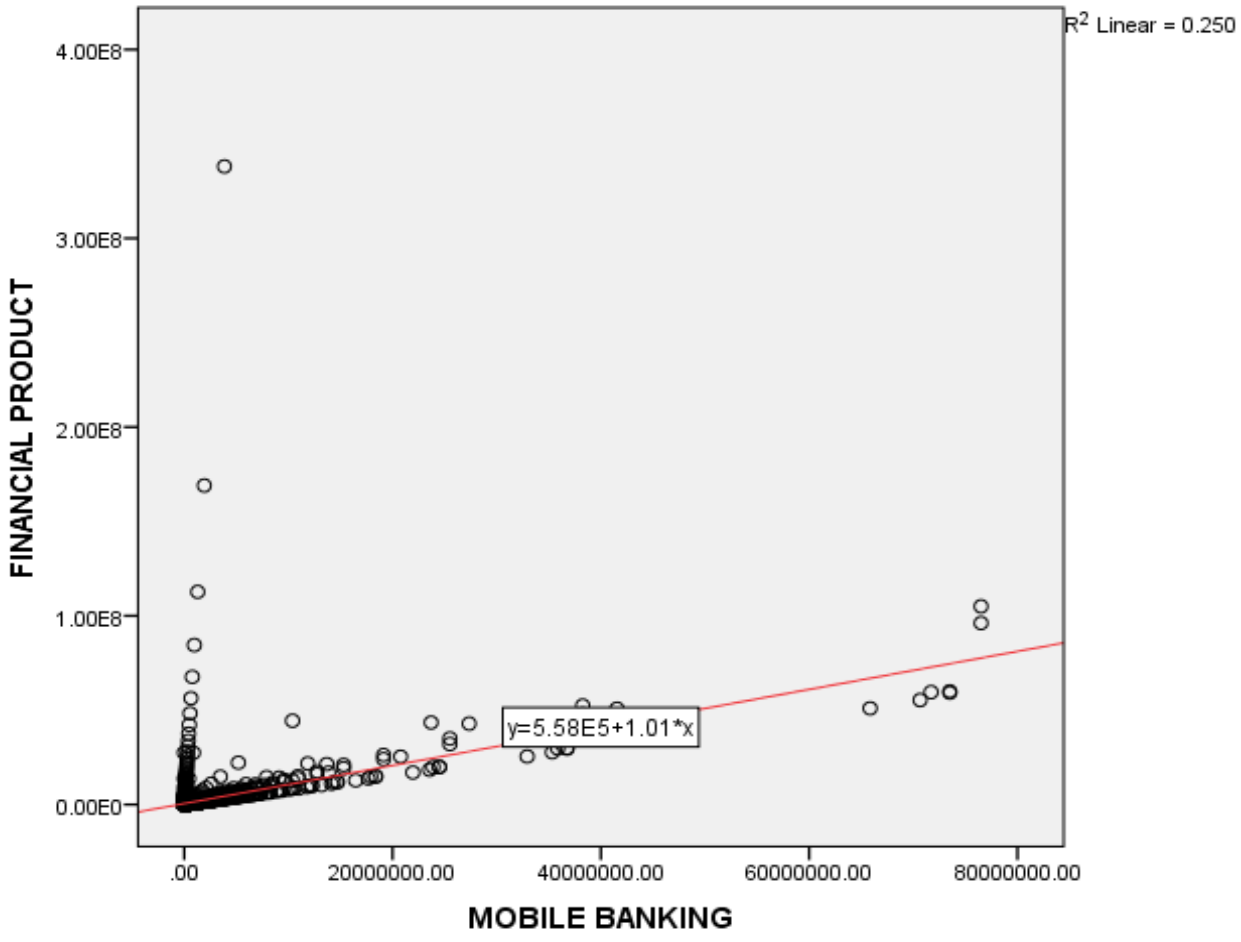
Table 4.10: Coefficients Result for Hypothesis 3

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	558072.202271	87615.101425		6.369589	.000
	Mobile banking	1.007581	0.024395	.500	41.302703	.000

a. Dependent Variable: Financial product

The results on Tables 4.8 – 4.10 above provided an investigation into the overall significance of the model. The value of R (regression coefficient) was 0.500, implying that there was a strong relationship between changes in technology (use of mobile banking) and access to financial services in Nigeria. The R-square indicates that about 25.0% variation in the endogenous variable (access to financial services) can be explained by the exogenous variable (changes in technology) while 75.0% was accounted for by other factors aside changes in technology (CIT). In addition, the estimated value of the regression coefficient (β) was 1.00. This shows that changes in technology has a significant positive contribution on access to financial services in Nigeria. That is, a relative increase in changes in technology will result in about 100% increase in access to financial services in Nigeria. This impact is high and significant.

To test for the significance of the independent variable, the probability value of the independent variable (FIL), that is, 0.000 indicates that changes in technology has a significant effect on access to financial services in Nigeria (i.e. p-value is less than 0.05 or 5% critical value). Thus, we accept the alternate hypothesis (H_1) and conclude that there was a positive impact of changes in technology on access to financial services in Nigeria. The result, thus, suggests that changes in technology have significant effect on access to financial services in Nigeria. This effect is shown in the regression line below.



The linear regression equation for this model is shown on the line as:

Y = 558072 + 1.01*x

which means that:

Financial product = 558072 – 1.01mobile payment

4.3 Discussion of Results

In the previous section of this chapter, the researcher presented and analysed the result of this study using the objectives of the study as a guide. internet access, financial literacy and mobile banking were used as proxies for the independent variable (electronic payment systems) as against financial product which was used as proxy for the dependent variable (access to financial services).

4.3.1 How internet access affects access to financial services in Nigeria

The study established that internet access statistically affects access to financial services in Nigeria (R = .509, P = 0.000 at P < 0.05). The coefficient of determination (R^2) in this present study was observed to be 26%. The findings suggest that about 26% variation in access to financial services in Nigeria can be explained by how well policy makers in the country adopt highly internet-based transactional policies that will ensure that those who are financially excluded are reached easily. This impact is quite significant and suggests the crucial role that digital financial services play in financial inclusion, particularly in improving access to and the use of services by the under-served population.

The findings in this study quite agrees with the findings in the study of Bayar, Gavriletea and Paun (2021) which was conducted in EU post-communist countries (Hungary, Latvia, Lithuania, Poland, and Slovenia and financial market access in Bulgaria, Croatia, and Hungary). Impliedly, it could be suggested from these findings that by increasing internet usage in Nigeria especially among residents of suburban and rural areas, access to financial institutions and financial markets in Nigeria could be improved. A similar opinion was also observed in the study of Khatoon and Ahmed (2019) in 39 Asian and African countries. Impliedly, it could be suggested that a major way of improving financial inclusion in Nigeria is to create an internet-enabled environment for residents both in urban and rural areas. Other authors that have toed this line of thought include the studies of Michael (2018) in Nigeria, Mago and Chitokwindo (2014) in Zimbabwe, Fernandes, Borges and Caiado (2021) I Mozambique, amongst many others. The results in these studies, thus, confirm the crucial role that digital financial services play in financial inclusion, particularly in improving access to and the use of services by the under-served population.

4.3.2 The Effect of Financial Literacy on Access to Financial Services in Nigeria

The study established that financial literacy has a statistically significant effect on access to financial services in Nigeria ($R = .690$, $P = 0.000$ at $P < 0.05$). The coefficient of determination (R^2) in this present study was observed to be 48%. The findings suggest that about 48% variation in access to financial services in Nigeria can be explained by how well the citizens are able to read, analyse, manage, and communicate about their personal financial conditions, make informed decisions about their money and minimize their chances of being misled on financial matters.

Invariably, the findings in this study suggest that a major bane of economic development in Nigeria could be lack of financial literacy and inability to maximize the growing financial markets which affects the extent to which citizens can make sound investment decisions which will enhance their economic well-being.

The findings in this study are quite similar to findings in the study of Twumasi, Jiang, Wang, ding, Frempong & Acheampong (2022) in Ghana who documented that that financial literacy was significant and positively related to access to financial services. Based on these findings, it could be surmised that financial literacy was essential for a viable financial system which in turn positively affects the economy as a whole. Similar opinion was made in the study of Okere, Mbanasor, and Uzokwe (2020) who argued that lack of financial knowledge was the main driver that pulls people away from financial markets.

The effect of financial literacy on access to financial services as revealed in this present study was also mentioned in the study of Shankari, Navarathinam and Suganya (2014) as well as that of Mundy and Masok (2011) who documented that financial literacy improves financial system regulatory mechanism, because of the fact that seeking and processing financial information by the common people reduces information asymmetry between financial service providers and customers, which in turn, reduces market failure.

4.3.3 How Changes in Technology Affects Access to Financial Services in Nigeria

The study established that changes in technology has a statistically affects access to financial services in Nigeria ($R = .500$, $P = 0.000$ at $P < 0.05$). The coefficient of determination (R^2) in this present study was observed to be 25%. The findings

suggest that about 25% variation in the access to financial services in Nigeria can be explained by how well or efficient the financial service providers grasp the importance of technology and incorporate it into their strategic plans accordingly. This impact is quite significant and suggests the pivotal role that the application of technology in a country's financial system will have on increasing financial services to the unbanked.

The findings in this study are quite similar to the findings in the study of Kwadwo, Kwadwo & Matilda (2019) in Ghana who documented that ICT has an appreciable positive effect on bank's performance due to improved customer service delivery which affects the growth of banks. Considerably, it could be surmised that flaws in IT facilities provided by banks in Nigeria could go a long way to deter most customers from accessing financial services. Thus, to increase access to financial services in Nigeria, considerable attention should be given to adequate provision of functional ICT facilities. A similar opinion was revealed in the study of Ibikunle and James (2012) in Nigeria who averred that information technology led to increase customer satisfaction, improved operational efficiency, reduced transaction time, better competitive edge, reduced the running cost and ushered in swift response in service delivery. This view was also expressed in the studies of Asare and Sakoe (2015) in Ghana, Monyoncho (2018) in Kenya, amongst many others.

However, the finding in this present study quite disagrees from the finding in the study of Okonkwo, Obinozie and Echekoba (2015) in Nigeria whose study suggested revealed that investments in e-banking services and ATMs do not really improve banks' performance. Another author who also toed this line of thought was Christopher, Mike and Amy (2006). In his own view, he revealed that availability of

financial technology facilities such as automated teller machine, internet banking and telephone banking do not have a significant influence on customer's bank choice decision. Perhaps, the variation in these studies could be adduced to the influence of socio-social structure of the people as well as the efficient utilization of financial innovation gadgets rather than simply acquiring additional investments. Similar view was also expressed in the study of Monyoncho (2018) and Akhisar, Tunay and Tunay (2015).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The purpose of this study was to determine the effect of electronic payment systems on financial inclusion in Nigeria (2000 – 2021). This section sums up this exploration study and its significant discoveries. The section is coordinated as follows; the synopsis of discoveries ends drawn from the discoveries, proposals made as well as the contribution of the study to knowledge.

5.2 Summary of Findings

The application of technology in a country's financial system will ultimately increase financial services to the unbanked. Without doubt, survival of any nation partly depends on ensuring financial inclusion for meaningful economic growth and development. However, there is scarcity of data on studies that have empirically determined the effect of electronic payment system in promoting financial inclusion in a developing country like Nigeria. Consequently, this study aimed at filling this knowledge gap. Below are the findings that were made at the end of the study:

i. Internet access was found to have a statistically significant impact on access to financial services in Nigeria ($R = .509$, $P = 0.000$ at $P < 0.05$). The findings suggest that about 26% variation in access to financial services in Nigeria can be explained by how well policy makers in the country adopt highly internet-based transactional policies that will ensure that those who are financially excluded are reached easily.

ii. The study established that financial literacy has a statistically significant effect on access to financial services ($R = .690$, $P = 0.000$ at $P < 0.05$). The findings suggest that about 48% variation in access to financial services in Nigeria can be explained by how well the citizens are able to read, analyse, manage, and communicate about their personal financial conditions, make informed decisions about their money and minimize their chances of being misled on financial matters.

iii. There was significant relationship between changes in technology and access to financial services in Nigeria ($R = .500$, $P = 0.000$ at $P < 0.05$). The findings suggest that about 25% variation in the access to financial services in Nigeria can be explained by how well or efficient the financial service providers grasp

the importance of technology and incorporate it into their strategic plans accordingly

5.3 Conclusion

This study determined the effect of electronic payment systems on financial inclusion in Nigeria in Nigeria from 2008 to 2021. The study established that internet access statistically affects access to financial services in Nigeria ($R = .509$, $P = 0.000$ at $P < 0.05$). It also established that financial literacy has a statistically significant effect on access to financial services in Nigeria ($R = .690$, $P = 0.000$ at $P < 0.05$). Results from the study also indicates that changes in technology statistically affects access to financial services in Nigeria ($R = .500$, $P = 0.000$ at $P < 0.05$). The regression coefficients (β) of 0.928, 0.855 and 1.007 show that increased internet access, financial literacy and use of mobile banking (changes in technology) would have positive contribution on access to financial services in Nigeria. Findings from this study therefore suggests that the application of technology in Nigeria's financial system will ultimately increase financial services to the unbanked. Likewise, financial literacy affects monetary advancement which assumes a fundamental part in making a feasible financial system.

5.4 Recommendations

Consistent with the findings of this study, the following recommendations would suffice:

I. Governments are advised to promote financial service levels by implementing a number of interventions aimed at improving the essential business environment for private institutions, including banks and institutions. financial services, operate and

extend financial services to more secluded rural areas. Extending services to remote areas can encourage individuals to become financially inclusive, which can help reduce the risk of current and future poverty.

ii. The management of banks in Nigeria needs to pay attention to integrating ICT into their strategic plans for effective performance in the payment and delivery systems. This would call for proper analysis to determine the type, nature and ICT products required for effectiveness and efficiency. It is imperative for bank management to intensify investment in ICT products to facilitate speed, convenience, and accurate services.

iii. Efforts should be made by the Nigerian government and policy makers to ensure that internet network providers in the country provides seamless internet network for effective and timesaving use of internet banking especially for those who reside in suburban and rural areas. There should also be consistent sensitisation programme by banks to educate residents in these areas to educate them on how to use various e-payment services or platforms.

iv. The Central Bank of Nigeria should strengthen its campaign for the adoption of electronic banking as it has been identified as one of the key drivers of financial inclusion.

v. Financial literacy education should be compulsory in Nigerian schools as evidence shows that possession of a degree has greatly influenced financial literacy.

5.5 Contributions to Knowledge

The major contribution to knowledge in this study is filling the existing gap in literature as observed in other studies that had focused on the effect of electronic

payment system in promoting financial inclusion. These include the studies of Bayar, Gavriletea and Paun (2021) from the EU post-communist countries, Khatoon and Ahmed (2019) on Asian and Africans Countries, the study of Mwangi and Evelyne (2012) in Kenya as well as that of Okonkwo, Obinozie and Echekoba (2015) which reported varying impacts. However, this study advances empirical knowledge on the contribution of e-payment platforms to financial inclusion in a developing country like Nigeria by using disaggregated data from 2008 - 2021. To the best of the researcher's knowledge, available researches on the effect of electronic payment system in promoting financial inclusion in Nigeria using disaggregated data are scanty.

The study will inevitably create awareness to stakeholders and the general public to make an informed investment decision based on a full understanding of contribution of electronic payment system on financial inclusion in Nigeria. It would also assist policy makers and government in the formulation of appropriate policies and laws that can help support enhancement of financial inclusion in Nigeria. It will also increase the number of existing literatures on the topic.

5.6 Suggested Areas for Further Studies

This study is by no means exhaustive. The researcher has noted other possible areas for further studies such as:

i. The work determined the impact of electronic payment frameworks on financial inclusion in Nigeria quantitatively. It is proposed that future investigations ought to likewise join subjective information to guarantee that the discoveries are more exhaustive.

ii. Future studies could also enlarge the scope to include data prior to 2008 in order to increase the number of observations and to update and validate the findings of the study

References

Abor, J. (2003). *Technological innovations and banking in Ghana: An evaluation of customers' perceptions*. University of Ghana: Legon, 1 – 5.

Abor, J. Y., Amidu, M. and Issahaku, H. (2018). Mobile telephony, financial inclusion and inclusive growth. *Journal of African Business, 19*(3), 430–453.

Andrianaivo, M. and Kpodar, K. (2012). Mobile phones, financial inclusion, and growth. *Review of Economics and Institutions, 3*(2), 30.

Agboola, A. A. (2002). Impact of electronic banking on customer services in Lagos, Nigeria, *Ife Journal of Economics and Finance*, 5(1), 2.

Aker, J. and Mbiti, I. (2010). Mobile phones and economic development in Africa. *J Econ Perspect, 1*(1), 207–232.

Akhisar, I., Tunay, K. B. and Tunay, N. (2015). The Effects of Innovations on Bank Performance: The Case of Electronic Banking Services. *Procedia - Social and Behavioral Sciences, 195*(1), 369 – 375.

Akingbola, A. (2006). The Benefits of Information Technology. Available at: http/www.ebusinessforum.com

Aragba-Akpore, S. (1998). The backbone of banks' service regeneration. *Moneywatch*, *22*(1), 23.

Ardic et al, (2019). Relationship between financial inclusion and economic growth in Nigerian rural dwellers. *International Journal of Small Business and Entrepreneurship Research, 3*(7), 17 – 27

Asare, M. and Sakoe, J. (2015). *Understanding Adoption and Continual Usage behaviour Towards Internet banking Services in Hong Kong.* Unpublished Master of Philosophy Thesis, Lingnan University, Hong Kong.

Asiimwe, D. K. (2015). *A model for information access and flow for electronic governance in selected local governments in Uganda.* PhD Thesis, Information Science, University of South Africa, Pretoria.

Amoah, A., Korle, K. and Asiama, R. K. (2020). Mobile money as a financial inclusion instrument: What are the determinants. *Journal of Finance, 47*(10), 1283 – 1297.

Asongu, S. A. and Le Roux, S. (2017). Enhancing ICT for inclusive human development in sub-saharan Africa. *Technological Forecasting and Social Change, 118*(1), 44 – 54.

Asongu, S. A. and Odhiambo, N. M. (2019). How enhancing information and communication technology has affected inequality in Africa for sustainable development: An empirical investigation. *Sustainable Development, 1*(2): 1–10.

Ayesha, K. and Roohi, A. (2020). The impact of internet connectivity on financial inclusion: A panel study on Asian and Africans Countries by using GMM**.** *Econometrics Letters,* 6(1), 1 – 26.

Babatunde W. A. and Raymond, O. A. (2019). Internet Usage, Financial Inclusion and Economic Growth in Nigeria**.** *"Ovidius" University Annals, Economic Sciences Series, 19*(2), 1 – 12

Bayar, Y., Gavriletea, M. D. and Păun, D. (2021). Impact of Mobile Phones and Internet Use on Financial Inclusion: Empirical evidence from the EU post-communist countries. *Technological and Economic Development of Economy, 27*(3), 722 – 741.

Beal, D. and Delpachitra, S. (2005). Financial literacy among Australian university students. *Economic papers*, 22(1), 65-78.

Beuermann, D. McKelvey, W. C. and Vakis, R. (2012). Mobile phones and economic development in rural Peru. *The Journal of Development Studies, 48*(11), 1617 – 1628.

Boateng, R. and Molla, A. (2006). *Developing e-banking capabilities: Preliminary lessons. Journal Banking and Commerce, 11*(2), 1 - 10.

Christopher, G. C., Mike, L. and Amy, W. (2006). A logit analysis of electronic banking in New Zealand. *International Journal of Bank Market, 24(*1), 360-383.

Daniel, E. (1999). Provision of electronic banking in the UK and Ireland*. International Journal of Bank Marketing, 17*(2), 72 -82.

Donovan, K. (2012). Mobile money, more freedom: The impact of M-PESA's network power on development as freedom. *International Journal of Communication, 6*(3), 2647 –2669.

Ene, E.E., Abba, G.O. and Fatokun, G. F. (2019). The Impact of Electronic Banking on Financial Inclusion in Nigeria. *American Journal of Industrial and Business Management, 9*(1)*,* 1409-1422.

Faboyede, O.S, Ben-Caleb, E, Oyewo, B. and Faboyede, A (2014) Financial Literacy Education: Key to Poverty Alleviation And National Development In Nigeria, *European Journal Accounting Auditing and Finance Research,* 3(1), 20 – 29

Fernandes, C., Borges, M. R. and Caiado, J. (2021). The contribution of digital financial services to financial inclusion in Mozambique: an ARDL model approach, *Applied Economics, 53*(3), 400-409.

Fungacova, A., Zuzana, S. and Weill, L. (2015). Understanding financial inclusion in China*. Journal of Economics, 34*(11), 196 – 206

Ghosh J. (2013). Microfinance and the challenge of financial inclusion for development. *Cambridge Journal of Economics, 37*(6), 1203 – 1219

Gosavi, A. (2018). Can mobile money help firms mitigate the problem of access to finance in eastern sub-saharan Africa? *Journal of African Business, 19*(3), 343 – 360.

Harold, B. and Jeff, L. (1995). Don't Let Technology Pass You By. *ABA Banking Journal*, *1*(1), 73.

Ibikunle, F. and James, O. (2012). Impact of information technology on Nigeria banking industry: A case study of Skye Bank. *International Journal of Computing Academic Research, 1*(1), 1 – 11.

Irechukwu, G. (2000). Enhancing the performance of banking operations through appropriate information technology. *Journal of Systems and Information Technology, 7*(2), 93-110.

Iwedi, I. and Uzo, A. (2018). Effects of cashless economy policy on national development: Evidence from Nigeria. *Journal of Economics and Management Sciences, 1*(2), 56-67.

Kabir, M.A., Saidin, S.Z. and Ahmi, A. (2015). *Adoption of e-Payment Systems: A Review of Literature*. Proceedings of the International Conference on E-Commerce, 112 – 120.

Kwadwo, K., Kwadwo, B. P. and Matilda, A. F. (2019). Effect of Information Communication

and Technology (ICT) on the performance of financial institutions (a case study of Barclays Bank, Sunyani Branch). *Munich Personal RePEc Archive, 1*(1), 1 – 37.

Laudon, D. P. and Laudon, J. P. (2001). *Management Information Systems: Organization and*

Technology in the Network Enterprises. New York: Prentice Hall International, U.S.

Lenka, S. K. and Barik, R. (2018). Has expansion of mobile phone and internet use spurred financial inclusion in the SAARC countries. *Financial Innovation, 4*(5), 1.

Lim, A. K. and Ting, O. U. (2012). Effects of Financial Innovations on the Financial Performance of Commercial Banks in Kenya. *International Journal of Humanities and Social Science, 4*(7), 51 – 57

Lule, T. Y & Omwansa, P. R and Waema, P. P (2012). Application of technology acceptance model (TAM) in M-Banking Adoption in Kenya. *International Journal of Computing and ICT Research, 6*(1), 31-43.

Lusardi, A. and Mitchell, O. S. (2011). Financial Literacy and Planning: Implications for retirement wellbeing (No. 17078). *National Bureau of Economic Research, 1*(1), 5-7.

Mago, S. and Chitokwindo , S. (2014). The impact of mobile banking on financial inclusion in Zimbabwe: a case for Masvingo Province. *Mediterranean Journal of Social Sciences*, 5(9), 221

Michael, C. N. (2018). Nexus between internet penetration and financial inclusion in Nigeria. *International Journal of Research and Innovation in Social Science, 2*(10), 1 – 7

Monyoncho, K. M. (2018). Effect of online banking on financial performance of commercial Banks in Kenya. Unpublished MBA Project, University of Nairobi, 1 – 18.

Morgan, P. and Long, Q. (2020). Financial literacy, financial inclusion, and savings behaviour in Laos. *Journal of Asian Economics, 68*(4), 1 – 15.

Mwangi, I. W. and Evelyne, N. K. (2012). Impact of Financial Literacy on Access to Financial Services in Kenya. *International Journal of Business and Social Science, 3*(19), 1 – 10.

Nitsure, R. R. (2003). E-banking charges and opportunities. *Economics and Political Weekly, 38*(1), 51 - 52.

Okere, P. A., Mbanasor, C. O. and Uzokwe, N. J. (2020). Relevance of financial literacy in financial sector development and stability in Nigeria. *International Journal of Research and Innovation in Social Science, 4*(7), 1 – 5.

Okonkwo I. V., Obinozie, H. E. and Echekoba, F. N. (2015). The effect of information communication technology and financial innovation on performance on Nigerian commercial banks (2001 – 2013). *International Journal of Accounting Research, 2*(7), 1 – 16.

Ouma, S. A., Odongo, T. M. and Were, M. (2017). Mobile financial services and financial inclusion: is it a boon for savings mobilization? *Review of Development Finance, 1*(1), 29–35.

Ovia, J. (2001). *Internet Banking: Practices and Potentials in Nigeria.* A paper presented at a

seminar organized by the Institute of Chartered Accountants of Nigeria (ICAN), Lagos Sheraton Hotel & Towers, Ikeja. September 05.

Oyelami O., Adebiyi S. and Adekunle, B. (2020). Electronic payment adoption and consumers' spending growth empirical evidence from Nigeria. *Future Business Journal, 6*(14), 1 – 14.

Paul, A. and Friday, O. (2012). Nigeria's cashless economy: the imperatives. *International Journal of Management and Business Studies, 2*(1), 31–36.

Shankar A. and Datta B. (2018). Factors affecting mobile payment adoption intention: an Indian perspective. *Global Business Review, 19*(3), 72-89

Malhotra, P. and Singh, B. (2009). The impact of internet banking on bank performance and

Risk: The Indian experience. *Eurasian Journal of Business and Economics*, 2(4), 43 - 62.

Ugwueze, A.C. and Nwezeaku, N. C. (2016). E-banking and commercial bank performance in Nigeria: A cointegration and causality approach. *International Journal of e-Education, e-Business, e-Management and e-Learning, 6*(3), 175 – 185.

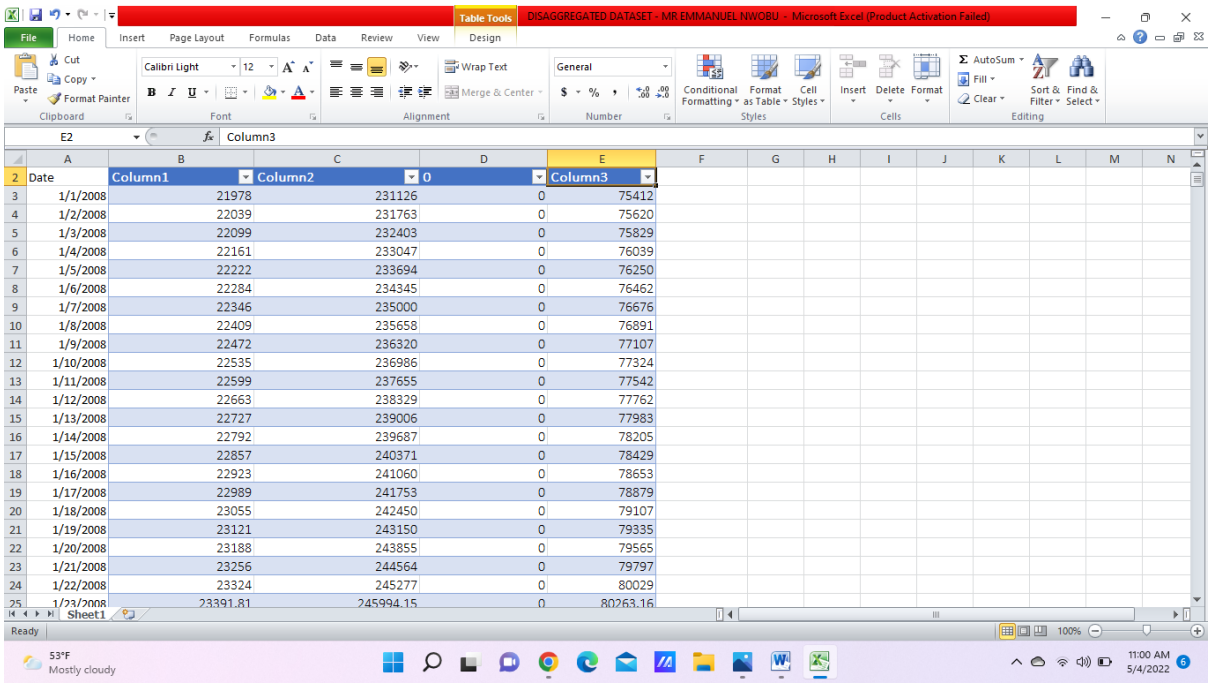
Twumasi, M. A., Jiang, Y., Zhao ding, P. W., Frempong, L. N, and Acheampong, M. O. (2022). Does financial literacy inevitably lead to access to finance services? Evidence from rural Ghana. *Ciência Rural, 52*(3), 1 – 16.

Sarma M. and Pais J. (2011). Financial inclusion and development. *Journal of International Development, 23*(5), 1 – 6.

Shankari S, Navarathinam K, Suganya R (2014). Financial Literacy towards Banking Products and Services: A survey. *Int. J. Manage. Res. Rev. 4*(3), 396-402.

Slozko, O., and Pello, A. (2015). Problems and risks of digital technologies introduction into e-payments. *Transformations in Business and Economics, 14(*1), 42-59

Yasuharu, I. (2003). *The Effects of Information System Investment in Banking Industry*. JEL Classification, D24, G21, L86.



DISAGGREGATED DATASET - MR EMMANUEL NWOBU - Microsoft Excel (Product Activation Failed)

Date	Column1	Column2	0	Column3
1/1/2008	21978	231126	0	75412
1/2/2008	22039	231763	0	75620
1/3/2008	22099	232403	0	75829
1/4/2008	22161	233047	0	76039
1/5/2008	22222	233694	0	76250
1/6/2008	22284	234345	0	76462
1/7/2008	22346	235000	0	76676
1/8/2008	22409	235658	0	76891
1/9/2008	22472	236320	0	77107
1/10/2008	22535	236986	0	77324
1/11/2008	22599	237655	0	77542
1/12/2008	22663	238329	0	77762
1/13/2008	22727	239006	0	77983
1/14/2008	22792	239687	0	78205
1/15/2008	22857	240371	0	78429
1/16/2008	22923	241060	0	78653
1/17/2008	22989	241753	0	78879
1/18/2008	23055	242450	0	79107
1/19/2008	23121	243150	0	79335
1/20/2008	23188	243855	0	79565
1/21/2008	23256	244564	0	79797
1/22/2008	23324	245277	0	80029
1/23/2008	23391.81	245994.15	0	80263.16

A sample of 5110 Data Set