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Financial Innovation and Earnings per Share of Listed Deposit Money Banks in Nigeria

Babatayo Kolawole Olayemi

Ph.D. Student, Department of Accounting, Babcock University, Inishan, Ogun State, Nigeria

Dr. Ogundajo Grace

Lecturer, Department of Accounting, Babcock University, Inishan, Ogun State, Nigeria

Siyanbola Tunji

Associate Professor, Department of Accounting, Babcock University, Inishan, Ogun State, Nigeria

Abstract:

The corporate performance of the banking sub-sector in any economy is not only of interest to the shareholders but also to the stakeholders such as the government, employees, creditors, customers and the general society. However, the DMBs in Nigeria had experienced different phases of corporate failures due mainly to poor financial performance leading to the liquidation, merger and outright revocation of licenses of many DMBs by the Central Bank of Nigeria. Financial innovation had been seen to influence the corporate performance of DMBs. In the light of all these, this study reviewed the effect of financial innovation on the corporate performance of listed DMBs in Nigeria.

The study adopted ex-post facto research design. The study population consisted of thirteen (13) listed deposit money banks (DMBs) in Nigeria as of 31st December 2020. The purposive sampling technique was used to sample 12 listed DMBs based on the availability of data representing 92 percent of the population. The period of study covered eleven (11) years covering 2010-2020. Secondary data were sourced from the published annual reports of the DMBs and National Bureau of Statistics (NBS). The validity and reliability were premised on the certified auditors' opinions given on the annual reports based on Sections, 401-404, CAMA, 2020, pre-established degree of checks by the FRCN, CBN vetting/approval of the annual reports and management of the DMBs preparation of the reports in line with IFRS framework. The study employed descriptive and inferential (multiple regression) statistics to analyze the data at 5% level of significance.

The study found that financial innovation had significant effect on earnings per share (EPS) (Adj. $R^2 = 0.22$; $F(5,10) = 254.96$; $p < 0.05$). The study concluded that financial innovation (FI) was a significant determinant of corporate performance. The study recommended that the management of the DMBs should take conscious efforts in their strategies, policies and plans to ensure their investments in financial innovation brings about the desirable outcome of improving performance.

Keywords: Corporate performance, Earnings per share, financial innovation, Net profit margin, return on assets, Return on equity, Tobin's Q

1. Introduction

The banking sector plays a major role in the economic growth and development of any nation and it is the catalyst for growth; hence, focus on the performance of the banking sector in any economy cannot be over-emphasized. According to Ajala, Amuda and Arulogun (2013), the banking sector acts as an intermediary between the surplus households who have so much money to save and the deficit households that need money to invest. Eyitope and Mayowa (2021) assertion that banks play a critical role in keeping the economy vibrant and societies stable, supports the view of Ajala, Amuda and Arulogun (2013).

Hence, the performance of the banking sector in any economy is not only of interest to the shareholders but also to the stakeholders such as the government, employees, creditors, customers and the general society. Without stable financial performance from the banking sector, satisfying the interests of the various stakeholders may become impossible and this is because financial performance is at the core of meeting the needs of these stakeholders (Adigun & Okedigba, 2017). Likewise, Adigun and Okedigba (2017) were of the view that when the banking sector is not performing effectively, the wealth of the shareholders cannot be maximized and the equity holders will not be able to get any returns on their investments.

Over the years, the DMBs in Nigeria have had different phases of corporate failures due mainly to poor financial performance leading to the liquidation, merger and outright revocation of licenses of many DMBs by the Central Bank of

Nigeria. The poor financial performance in the banking sector in Nigeria dated back to as far as 1930 during which major banking failures were recorded.

The banks failures caused by poor financial performance of the DMBs led to a total of 145 (One Hundred and Forty-Five) banks being liquidated, merged or had their licenses withdrawn by the CBN between the year 1936 to 2009 (NDIC, 2002; Sanusi, 2009; Adeyemi, 2011; Ohwofasa & Mayuku, 2012; Ugoani, 2015; Marshal, 2017). The failures of these banks led to the loss of billions of investments by the investors; loss of customer deposits; erosion of shareholders' value; and no return on assets and equity (Marshall, 2017).

Iswatia and Anshoria (2007) cited by Simiyu and Tobias (2018) defined performance as the ability of an organization to gain and manage the resources in several ways to gain competitive advantage. Alam (2011) also stated that a firm's performance is a multidimensional construct that consists of several elements. Customer focused performance includes customer satisfaction, product and service excellence, while financial and market performance focused on revenue, profits, organizational effectiveness, time to market, level of innovation, production and supply chain flexibility.

The Nigerian DMBs in the technological driven world of today face more performance challenges due to the rapid changes in the way businesses are now being conducted due to technological innovation. According to Ejike (2018), it was possible for banks to satisfy their customers two decades ago by meeting their own performance targets without the need to develop any new products or resort to any innovation to enhance service delivery. This is because account holders and banks were few; with low volume of transactions; and lack of competition in the banking industry. However, in the world of today, technology and competitors who have a huge potential to make radical changes on the financial sector have disrupted the traditional banking business. Zheng and Zhong (2018) were also of the view that the traditional banking businesses have been impacted significantly by the rapid technological development of non-banking high tech industries. Hence, the income accruable to the traditional banking sector from traditional banking services has increasingly been encroached by non-banking high tech industries creating financial performance issues.

Going by the need to exploit alternative means of generating income, improve financial performance and ultimately maximize shareholder's wealth, companies have therefore been making different decisions to change the way businesses are being done in order to improve their performances. The banking sub-sector is not an exception in this regard. Adner (2002) states that there are various reasons devised for innovation in technology and machinery by firms with the ultimate objective of profit maximization through efficient utilization of available resources and the reduction in the operating costs.

The financial innovation provides opportunities for financial institutions to have important cost advantages, ease their risk and increasing profitability than the traditional way of banking. Moreover, various studies conducted depict that, electronic-based applications products of financial institutions affect financial performance positively (Okiro & Ndungu, 2013, Glavee-Geo, 2017), thus yielding returns for institutions when invested in the short run. In Nigeria, Okeke and Okpala (2013) state that banking is undergoing a rapid change as the international economy expands and advances towards institutional and market competence occasioned by the changing dictates of disruptive innovation. However, despite of the importance of sustaining the performance of the banking sector in Nigeria as a way of boosting the country's economy, studies solely focusing on financial innovation and performance of listed DMBs in term of earnings per share in developing economies particularly Nigeria using the three metrics of financial innovation seem to be very limited and scarce

The study therefore focuses on the effect of financial innovation on earnings per share of listed Deposit Money Banks in Nigeria.

The objective of the study, therefore, was to assess the effect of financial innovation on earnings per share of listed deposit money banks (DMBS) in Nigeria and the hypothesis for the study is stated as follows:

- **H₀:** There is no significant effect of financial innovation on earnings per share of listed Deposit Money Banks (DMBs) in Nigeria.

2. Conceptual Review

2.1. Corporate Performance

The issue of corporate performance has received critical attention from researchers in various regions of industry and key administration (Aondoaka, 2015). Corporate organizations are in the business for various reasons. Some of these reasons are not limited to cost reduction, revenue generation, and ultimately maximization of profit. Corporate performance is the measurement of the objectives intended to be achieved by the organizations through profit maximization (Akintoye, 2006). Business embarks on innovation and decisions on investment to ensure that companies' performance over the period is good and shareholders can maximize their returns over time. Corporate business performance has been evaluated using various measures and these have evolved overtime. Some of these measures according to Akintoye (2006), Hirschey and Nofsinger (2008) and Olowe (2017) are retained earnings, increase in total assets, and increase in the market size of the companies.

Different ratios are majorly used in firm level performance and this includes Return on Equity (ROE), Return on Assets (ROA), and Return on Capital Employed (ROCE), Net Profit Margin (NPM), Earning per Share (EPS), Dividends per Share (DPS), Tobin's Q etc. Fernandez, Romero, Ruiz (2012) and Vafaei (2015) are of the views that budgetary presentation measures, reliable reviews typically use accounting-based measures, such as ROS, ROA, ROE, and Tobin's Q, or potentially market-based measures, such as return and risk, are used to measure corporate performance.

Bank performance generally implies whether a bank has fared well within a trading period to realize its objectives. According to Rose, (2017), a fair evaluation of any bank's performance should commence by evaluating whether it has been able to achieve the objectives set by management and shareholders. According to Salehi and Alipour (2014), banks have different objectives set for themselves. While some wish to grow faster and achieve some long-range growth objective, others seem to prefer quiet life, minimizing risk and conveying the image of a sound bank, but with modest rewards to their shareholders. Abaenewe, Chibueze, Maxwell and Osondu (2013) posited that stock prices and its behavior are deemed to reflect the performance of a firm. They opined further that this is a market indicator and may not be reliable always.

For the purpose of this study, profitability indicator used as a measure of the DMBs performance is precisely Earnings per Share (EPS).

2.2. Earnings per Share (EPS)

This financial performance measure indicates the amount of profit earned on each outstanding ordinary share usually expressed in kobo. It is an important financial measure, which indicates the profitability of a company. It is a tool used by the market participants to gauge the profitability of a company before buying shares. EPS is the portion of a company's profit that is allocated to every individual share of the stock. According to Gibson (2009), earnings per share are the amount of income earned on a share of common stock during an accounting period.

The EPS can be formulated as follows:

$EPS = \text{Net profit after tax} / \text{Number of Shares}$ (George, 2005; Michael, Ahmad, Hakeem, Mary-Jane and Babajide, 2020).

2.3. Financial Innovation

In the 21st Century, technology remains an important tool that every business relies on to provide services, satisfy the needs of the stakeholders and meets the needs of their clients. The DMBs in Nigeria are no exceptions to this development. Technological innovation has therefore become a part of the daily business processes and any organization who fails to embrace this may have performance related problems. Even-though, the banking sector in Nigeria has adopted the financial innovation more than a decade ago, however, the occurrence of Covid-19 pandemic has forced the DMBs in Nigeria to now leverage more on financial innovation products to reduce crowd in the banking hall and enhance faster delivery of services, improve performance, among others. Arround and Matej (2010) and Chukwunulu (2019) opine that financial innovation is propelled by developments in technology.

Different scholars have defined the concept of financial innovation in various ways. Often times, disruptive innovation and financial innovation are used inter-changeably in the financial circle. Dew (2007) cited in Ejike (2018), is of the view that the survival of any bank is determined by how well it can gather funds from the customers at the lowest cost; buy money, do something with the money, and then sell it to their profits. Financial innovations therefore enable firms from different sectors to source money in big amounts and at a cheaper cost than they could elsewhere.

Nejad (2016) explains that financial innovations are the online and mobile financial transactions, expansion of electronic payments and exchanges processing, new payment services such as Apple Pay and Android Pay, money management such as Google Pay, digital currency such as Bitcoin, peer-to-peer lending services websites, usage-based insurance, and longevity bonds and swaps. Nejad (2016) opines further that the scope of financial instruments and technologies include institutional innovation, process innovation and product innovation.

Institutional innovation encompasses new types of financial firms such as specialized credit card, internet banking, discount broking firms, etc. Product innovations denote new products ranging from securitized assets and mortgaging of foreign currency, while process innovation refers to new ways of doing financial business using Automated Teller Machine (ATM), Point of Sale (POS), online banking, mobile banking etc. (Tufano, 2018).

Kamau & Oluoch (2016) opine that financial innovation has been used by many banks as a formidable strategic variable to override any form of competition among the deposit money banks by which banks can improve their performance while simultaneously being able to maintain their effectiveness in the market.

Within the banking sub-sector, innovation has become a key interest as it has been established that it plays a major role in corporate performance and generates employments over the period (Jegede&Ojo, 2012). According to Adeyeye, Jegede, and Akinwale (2013), innovation is the process by which firms master and implements the design and production of goods and services new to the business line notwithstanding whether they are new to their environments in terms of competitors, countries and the world in general.

2.4. Automated Teller Machine

This is a form of product innovation and is a device that allows a bank customer to access money from his/her account via a cash dispensing machine and the customer's account is automatically debited with same amount withdrawal (Ojukwu & Sujuyigbe, 2016). The banking activities performed on the ATM has now been improved as other banking activities are now carried out like cash deposit, fund transfer, loan applications among others.

Historically, Nigeria joined the countries using ATM following the installation of the first ATM by National Cash Register (NCR) for the defunct Society Generale Bank in 1987 (Jegede, 2014). According to Adeoti (2013), the defunct Society Generale Bank (SGBN) was the first Nigerian bank to introduce ATM for their customers. SGBN had "Cash Point 24" as the trade name for the new introduced ATM that was the only ATM in operation at that time in Nigeria. First Bank of Nigeria was the next bank in Nigeria to introduce the use of ATM to its customers in December 1991.

Automated teller machine (ATM) is therefore conceptually defined in the study as an electronic banking machine that accepts and dispenses cash, allows bank customers to perform other banking services with use of a credit card or debit card, registered mobile phone or through the use of thumb printing without the aid of the bank's teller or representative.

2.5. Internet Banking

Siyanbola (2013) defines internet banking to involve conducting banking transactions on the internet using electronic tools such as the computer without visiting the banking hall. E-commerce is greatly facilitated by internet banking and is mostly used to effect payment. Commonly used internet banking transactions in Nigeria are settlement of commercial bills and purchase of air tickets through the websites of the merchants.

The full acceptance of internet banking in Nigeria has been plagued by frauds. Olaleye and Fashina (2019) are of the view that internet banking has introduced a new complex problem of fraud and has become potential threat to the Nigeria banking industry. Kolapo and Olaniyan (2018) also opined that the banking sector is plagued with an increasing complaint of fraud, which is a contributor to the operational risk of a business and discourages the banking populace from adopting internet banking fully. These views are in alignment with the submission of Abilogun and Imagbe (2017) where they state that electronic banking products are susceptible to errors and vulnerable to frauds.

In this study, conceptually, internet banking is defined as the use of internet facilities to facilitate business relationships between the organization, its customers and other stakeholders. In this wise, internet banking innovation accords the customers of the banks to carry out banking transactions in the conveniences of their homes at a fee-based commission to the banks.

2.6. Agency/Point of Sale (POS) Banking Innovation

Agency banking is an alternative distribution strategy in which traditional retail banking use authorized agents to expand the reach of the branch network. It is generally seen as a better way to reach more people, more locations and to enhance financial inclusion. Kithaka (2017) and Kasekende (2018) believe that agency banking represents essential opportunities that reduce transaction costs.

In a study conducted in 2018 by Enhancing Financial Innovation and Access (EFInA), 65% of Nigerians responded that affordability barriers, such as irregular income and the cost of maintaining a banking account have discouraged them from formal banking institutions. Furthermore, the report states that a quarter of the respondents responded, "banks are too far".

According to EFInA (2018), there were only 8000 bank branches in the country of over 200million people, and most branches are concentrated in the cities. Also, According Abubakar (2021), the total number of agents under the agency banking in Nigeria increased by 517% between 2017 and 2019. This view was also supported by the study of Watiri (2013), where he found that low transaction cost through agency banking had a positive impact on financial performance of Kenya commercial banks.

Therefore, in this study, the conceptual definition of Agency Banking Innovation is that is a last mile delivery-banking channel.

2.7. Mobile Banking Innovation

This involves the use of mobile phone for settlement of financial transactions. This is more or less fund transfer process between customers with immediate availability of funds for the beneficiary. It uses card infrastructure for movement of payment instructions as well as secure SMS messaging for confirmation of receipts to the beneficiary.

The mobile banking innovation is one area the Nigerian banking sector can continue to improve in order to improve income generated from fee-based commission from the use of mobile phones to transact banking businesses. According to a report from Data Reporter survey carried out in the year 2020, It was stated that there were 169.2million mobile connections in Nigerian in January, 2020. This figure was an increase by 7.7% from the previous figure in January, 2019. Hence, it grew by an additional 12million new mobile connections. Data Reporter (2020), hence, concluded that the number of mobile connections in Nigeria in the year 2020 was equivalent to 83% of the total population. The high level of mobile connections in Nigeria presents a very great opportunity for the Nigeria banking sector to improve performance through generating more revenue by ensuring more inclusion of the banking platform via the mobile banking innovation.

2.8. Real Time Gross Settlement Innovation

The term real-time gross settlement (RTGS) refers to a funds transfer system that allows for the instantaneous transfer of money and/or securities. RTGS is the continuous process of settling payments on an individual order basis without netting debits with credits across the books of a central bank. This institutional innovation was developed to cover the inadequacy of the cheque clearing system. The RTGS is used for real time online fund transfer, used for high value transactions, it is safe and secure, it is reliable and backed by the RBL, it is for immediate clearing, funds are credited on a one-on-one basis and transactions are executed on an individual, gross basis. Upon completion, RTGS bank transfers are final and irrevocable, and in most of the world, RTGS systems are run by central banks.

Kanu, Eke, Nwadiubu, and Ikechukwu (2020), defines RTGS as a transfer method used by Nigerian banks to move sums above N10 million for a single beneficiary. Real-time gross settlement systems are specialist transfer support systems where the transfer of money or securities takes place from one bank to some other bank on a real-time and a gross premise. RTGS innovation systems are used mostly for high value fund exchanges that require and receive immediate clearing.

In this study, real-time gross settlement (RTGS) innovation system is conceptually defined as a fund transfer system that allows one to transfer money or securities immediately.

3. Theoretical Framework

3.1. Schumpeter Theory of Innovation

Joseph Schumpeter developed the theory, Schumpeter theory of financial innovation in 1928. The Schumpeter theory assumes that technological progress emanates from innovations initiated by firms in pursuit of profits. The model was premised on three propositions. The theory asserts that technology creates opportunities for new profits and super profits because of increased investment by companies on innovation.

Critics of Schumpeter theory of financial innovation however believe that for all the propositions of Schumpeter on the role of innovation, he failed to really explain the genesis of innovation. Thus, it gave room for Keynesian economics to argue that levels of investment were the cause of innovation. It was not until the 1960s that economists would begin again to search for the source of innovation. Critic of also argued that Schumpeter regard of innovation as the main cause of economic development is untrue. They believe that this view is far from reality because economic development of a country does not depend on innovations only but also on many economic and social factors.

Researchers such as Mugane and Ondigo (2016), Nkem and Akujinma (2017), Ibekwe (20210), and Effiom and Edet (2020) did not only support the assumptions of the theory but also adopted the Schumpeter theory of financial innovation as the basis for their studies.

This theory is vital to this study because for DMBs in Nigeria to remain competitive in the ever-changing financial institution dynamics and to manage the risk of extinct from the industry, then continuous innovation is vital for them to continue to perform financially.

3.1.1. Resource-Based View Theory

Wernerfelt, Rumelt and Barney propounded the resource-based theory in the mid-1980s. The theory was based on two critical assumptions that are (i) resources must be heterogeneous, in the sense that skills, capabilities and other resources that organizations possess differ from one firm to another. It is believed that organization will not be to outcompete one another if they all have the same amount and mix of resources.

The theory therefore asserts that firms compete based on their resources and capabilities (Peteraf and Bergen, 2003). It asserts further that firms possess a sub-set of resources, which enable them to achieve competitive advantage, and a subset of those that lead to superior long-term performance. The theory has since become one of the dominant contemporary approaches to the analysis of sustained competitive advantage.

The resource-based view theory has been thoroughly criticized. Some of the critiques had suggested an indirect amendment to the theory. These include critics such as Foss, Klein, Kor and Mahoney (2008), Makadok (2001b) and Spender (2006), Priem and Butler (2001a), Collis (1994), Gilbert (2006a, 2006b), Corner (1991) and Kogut and Zander (1992). Their criticism of the theory was anchored on six pillars. Firstly, the RBV theory was viewed as lacking managerial implications; secondly, the RBV implies infinite regress; thirdly, the RBV theory applicability is too limited; fourthly, the RBV theory is not a theory of the firm; fifthly, the value of resources is too indeterminate to provide for useful theory; and sixthly, the definition of resources is unworkable.

Kraaijenbrink, Spender and Groen (2009) are in support of the RBV theory. They argue that the criticisms do not really threaten the RBV status. They also opine further that the criticisms are incorrect or too irrelevant, and only apply when the RBV is taken to its logical or impracticable extreme. Hence, Kraaijenbrink, Spender and Groen (2009) totally align with the proposition of Wernerfelt, Rumelt and Barney (1980)

This theory is relevant to the study because adoption of innovation by the DMBs requires a pool of resources, both tangible and intangible resources to be able to create a competitive edge over others, as well as improving financial performance of the bank.

3.1.2. Diffusion Innovation Theory

E. M Rodgers in 1962 first put forward the theory of diffusion innovation. Rodgers (1962, 1995), sought to explain the manner in which financial innovations and ideas were passed across the populations in a society through market or non-market channels or just through an organization. He opined that the innovations are passed from one person or entity to another through the process of diffusion. Rogers (1995) diffusion of innovation theory explains how financial innovations are accepted by the society.

Therefore, the members of the society tend to adopt innovation with a view of making informed decisions. Innovations are very instrumental in the attainment of development and sustainability and therefore should be adopted by firms to enhance financial performance of organizations. In addition, Tidd (2006) was of the opinion that through technological development and network effect, new financial innovation diffuses to other competing organizations. The theory further opines that not all individuals and firms adopt a technological development or a new product at the same time, but it spreads over time and upon introduction, the product is marketed to gain larger market share.

This theory is relevant to the study because the general adoption and acceptability of innovation by the society is paramount to the financial performance of the organization. Hence, the DMBs in Nigeria must strive to create strong awareness on the acceptability of their financial innovation products so as to achieve financial inclusion and ultimately, profit-maximization.

3.1.3. Constraint-Induced Financial Innovation Theory

Silber developed the constrained-induced financial innovation theory in 1977. The theory is based on the assumption that the key reason of innovation in financial services is to enhance the growth and profitability of financial institutions. The theory hence opines that the main motive for embracing financial innovation by a firm is to improve its performance. It also asserts that profit maximization is the main purpose of financial innovation.

Researchers, such as Lerner (2006) aligns with the position of Silber (1977) when he opines that commercial bank which operate in a market with more constraints have the greatest inducement of embracing financial innovation that assist in boosting their financial performance because of reduction in operational costs. Johnson and Kwak (2012) further state that, commercial banks that do not embrace financial innovation are deemed to fail.

This theory is relevant to the study because adoption of innovation by the DMBs is premised on service improvement, financial inclusion and ultimately, profit-maximization.

3.1.4. Transaction Cost Innovation Theory

Hicks and Niehans established the transaction cost innovation theory in 1983, who were of the view that the main reason for financial innovation is transaction cost reduction and earning benefits. The theory assumption is based on the relationship between reduction in transaction costs and technological advancement. The theory asserts that the dominant factor in financial innovation is the response to advancement in technology and this causes the transaction costs to reduce. Consequently, the cost reductions stimulate financial innovation as well as efficiency in service delivery.

Juhakam (2013) adopts this theory as he describes the theory of cost reduction as a driver of financial innovation. He cites examples as reduction from improvements in payments, processing or reduction resulting from new ways meant to deliver services electronically to customers. However, regulatory restrictions and requirements are also a cost and some innovations are aimed at avoiding or reducing that cost.

This theory is therefore significant to this study, as it will assist the researcher in articulating the relationship between financial innovations and financial performance of DMBs in Nigeria because of transaction cost reduction measures and earning of profits. For instance, the use of internet-connected Information Technology (IT) can substantially reduce a firm's transaction costs as it enables efficient coordination, management and use of information. Mobile, Internet-connected IT may further lower transaction costs as it provides also offsite access to the firm's internal database and other relevant sources of information.

3.2. Theoretical Framework

From the review of relevant theories relating to financial innovation and performance of listed Deposit Money Banks in Nigeria, it is evident all the theories reviewed are relevant to this study Hence, the study was underpinned by the Constraint-Induced Financial Innovation Theory, Resource-Based Theory, Transaction cost theory, Diffusion Innovation Theory and Schumpeter Theory of Innovation. This is because these theories advocated for firms' adoption of innovation as a means to reduce cost, increases acceptance by the stakeholders and maximize profits.

3.3. Empirical Review

3.3.1. Financial Innovation and Earning Per Share

In a study carried out by Michael, Ahmad, Hakeem, Mary-Jane and Babajide (2020), to examine the effect of electronic banking on bank performance in Nigeria, using multiple regression analysis techniques and utilizing the secondary data derived from the audited annual financial statement of the deposit money banks quoted on the Nigerian Stock Exchange from 2008–2017. While using the multiple regression analysis techniques, the findings revealed that e-banking measured by return on equity (ROE), return on assets (ROA), and earnings per share (EPS) has no significant impact on the performance of banks in Nigeria. The study concludes that investment in electronic banking has not improved the performance of deposit money banks in Nigeria.

The study of Mohammad, Riyardh and Saad (2011) was on the impact of electronic banking on bank performance in Jordan. The study employed the use of 15 banks with a time scope of 10years from the year 2000-2010. Ordinary least square (OLS) regression was used to analyze the research data and the study found that electronic banking did not influence positively on bank performance measured by earnings per share (EPS).

In another study by Ceylan, Emre and Asli (2018), which was aimed at examining the impact of internet banking on the financial performance in terms of profitability in Turkish banks. The data for the study data were collected from thirteen banks that adopted online banking in Turkey during the period 1996 and 2005. The paper aimed at finding the impact of internet banking on the return on assets (ROA), equity (ROE), EPS, the interest spread, overhead expenses, commission and fee income in Turkey. The finding of the paper showed that internet banking has a positive impact on the profitability of banks in Turkey.

Antonnet (2014) carried out a study on product innovation and its effects on financial performance of commercial banks in Kenya using EPS as a proxy. The study focused on the effect of core products innovation, formal product innovation and augmented product innovation on financial performance of commercial banks. The study adopted explanatory research design with 106 senior and branch managers from nine commercial banks served as the respondents. Questionnaires and secondary data obtained from 2013 audited annual financial statements of commercial banks were utilized to collect data. The multiple regression results showed a negative relationship between product innovation and EPS of commercial banks in Kenya. The study recommended for similar research in order to establish other useful findings that this study may have been unable to determine.

Cherotich, Sang, Shisia, and Mutung (2015) study objective was to establish the effect of financial innovation on financial performance of commercial banks in Kenya. The study used secondary data of sampled 44 commercial banks as source of data. Findings from the regression analysis showed that there is a strong relationship between financial innovations and earning capacity of the banks viz the returns to the shareholders. In conclusion, financial innovation was found to positively affect financial performance.

4. Methodology

The *ex-postfacto* design was adopted as the research design for this study. The *ex-post facto* design method was considered appropriate for the study because the study entailed the use of annual audited reports and accounts of the quoted Deposit Money Banks (DMBs) in Nigeria under study.

4.1. Population

The population of this study consisted of all the listed DMBs licensed, regulated and supervised by the Central Bank of Nigeria as of 31st December, 2020. To this end, 13 (thirteen) DMBs formed the population of the study. A justification for selecting the banking sector for the study was anchored on the role they play in the economy as financial intermediary by channeling funds from sufficient households to deficit households within the economy as shown in Table 1.

4.2. Sample Size and Sampling Technique

The sample size for the study comprised of 12 (twelve) listed DMBs in Nigeria as of 31st December 2020. The sampled 12 (twelve) listed DMBs represents 92 percent of the population. The sampling technique that was adopted in the study is the purposive sampling.

4.3. Model Specification

The model that was used in ascertaining the effects of the independent variables on the dependent variables of the study is specified as:

Model Specification

$Y=f(X)$

$CP = f(FI)$

Y = Dependent Variable = Corporate Performance (CP)

X = Independent Variable = Financial Innovation (FI)

4.4. Functional Relationship

$CP = f(ATM, IB, APB, MB, RTGS) \dots\dots\dots(\text{eqn. 1})$

4.5. Regression Model

$EPS_{it} = \beta_0 + \beta_1 ATM_{it} + \beta_2 IB_{it} + \beta_3 APB_{it} + \beta_4 MB_{it} + \beta_5 RTGS_{it} + e_{it}$

Where:

β_0 = Intercept

ATM = Automated Teller Machine (independent Variable)

IB = Internet Banking (independent Variable)

APB = Agent POS Banking (independent Variable)

MB = Mobile Banking (independent Variable)

RTGS = Real Time Gross Transfer Settlement (independent Variable)

ROA = Return on Asset (dependent variable)

EPS = Earnings Per Share (dependent variable)

e_i = Error Term

$\beta_1 - \beta_5$ are coefficients of the independent variables

5. Data Analysis and Discussion of Finding

5.1. Regression Tables for the Hypothesis

Hypothesis four was tested using the multiple regression analysis. The data for information technology control (ASC, AAC and NSC) and fraud risk detection were created by summing responses of all items for each of the variables. The results of the regression are presented in Table.

Dependent Variable: Corporate Performance (CP)				
Fixed-effects Regression with Driscoll-Kraay standard errors				
Variable	Coefficient	Std. Err	T-Stat	Prob
Constant	-9.1185	5.4122	-1.68	0.123
ATM	0.0308	0.7142	0.04	0.966
APB	1.7714	0.7055	2.51	0.031
IB	0.5305	0.1621	3.27	0.008
MB	-0.9030	0.3799	-2.38	0.039
RTGS	-0.2963	0.1054	-2.81	0.018
Adj. R ²	0.215			
F-Stat/Wald Stat	F _(5, 10) = 254.96 (0.00)			
Probability of F-Stat	0.0000			
Hausman Test	chi ² ₍₅₎ = 100.38 (0.000)			
Testparm Test/LM Test	F _(10, 105) = 2.26 (0.0196)			
Heteroskedasticity Test	chi ² ₍₁₂₎ = 1443.06 (0.000)			
Serial Correlation Test	F _(1, 11) = 4.067 (0.0688)			
Cross-sectional Independence	2.2750 (0.0060)			

Table 1: Financial Innovation and Earnings per Share of Listed Deposit Money Banks in Nigerian
Source: Researcher's Computation (2022)

- Notes: The dependent variable is Earnings Per Share (EPS), the independent variables are Automated Teller Machine Innovation (ATM), Agency/POS Banking (APB), Internet Banking/Web Payment (IB), Mobile Banking (MB) and Real Time Gross Transfer Settlement Scheme (RTGS). ** and *** indicates statistical significance at 5 and 1 per cent respectively

5.2. Post-Estimation Results: Interpretation of Diagnostic Test

From Table 1, the diagnostic tests reported are the Hausman test for fixed effect, the test parameter Test /LM Test, the heteroscedasticity, the Wooldridge test for autocorrelation and the Pesaran's test of cross-sectional independence. The Fixed-effects Regression with Driscoll-Kraay standard errors was used in the study. These tests were carried out to determine the appropriateness of the estimation technique for the specified model.

First, the Hausman test was carried out to determine either fixed effect or random effect estimation technique is appropriate for the model. The Hausman specification test has as its null hypothesis that the random effect model is consistent and efficient, while the alternative hypothesis states that the fixed effect estimates are consistent and efficient. The result of the Hausman test statistic of 100.38 with the *p-value* of 0.000, being less than the 5 percent level of significance chosen for the study reveals that fixed effect is the appropriate estimator. Thus, the significance of this test result indicated that the null hypothesis of the Hausman specification test can be rejected by the study. Therefore, the fixed effect estimation technique is appropriate for model two. The study went further to test the appropriateness of the fixed effect estimation technique by examining the Testparm/LM test. The result of this test showed test statistic of 2.26 with a probability of 0.0196 which is less than the 5% level of significance used in the study, thus supporting the result of the Hausman specification test for the use of fixed effect model in Model two in the study.

In testing for autocorrelation in the panel data, the Wooldridge test was used. The null hypothesis that the successive error terms are not correlated was accepted as against the alternative hypothesis that the successive error terms are serially correlated. This decision is supported by the result of the Wooldridge test statistic of 4.067 with a probability value of 0.0688 which is higher than the 5% level of significance used in the study. This result simply indicates that there is no serial correlation problem in model two.

The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was carried out to determine if the variance of the residual is constant. The null hypothesis of homoscedasticity was rejected, and the alternative hypothesis of heteroscedasticity was accepted. This was because the test statistic of 1443.06 with a probability value of 0.000 which is less than the 5% level of significance used in the study. This result connotes that there is a presence of heteroscedasticity in the model two.

In addition, to determine the cross-sectional dependence among the deposit money banks in Nigeria, the Pesaran CD test was carried out. The CD test statistic of 2.2750 and with a probability value of 0.0060 which is lower than the significant level of 5% evidenced that the model has cross-sectional dependence problem.

However, due to the presence of heteroscedasticity and Cross-sectional dependence problem in the Model, the model corrects for the fixed effect model by using Fixed-effects Regression with Driscoll-Kraay standard errors was used.

5.2.1. Interpretation

Model 1

$$EPS_{it} = \beta_0 + \beta_1 ATM_{it} + \beta_2 IB_{it} + \beta_3 APB_{it} + \beta_4 MB_{it} + \beta_5 RTGS_{it} + e_{it} \dots \dots \dots \text{Model 2}$$

$$EPS_{it} = \beta_0 + 0.0308 ATM_{it} + 0.5305 IB_{it} + 1.7714 APB_{it} - 0.9030 MB_{it} - 0.2963 RTGS_{it} + e_{it}$$

From the results in Table 1, The regression estimates show that Automated Teller Machine Innovation (ATM), Agent/POS Banking (APB) and Internet Banking (IB) had a positive effect on Earnings Per Share (EPS) while Mobile Banking (MB) and Real Time Gross Transfer Settlement (RTGS) had a negative effect on earnings per share (EPS) of listed deposit money

banks in Nigeria. This is indicated by the signs of the coefficients, which are 0.0308, 0.5305 and 1.7714 (ATM, IB and APB), and -0.9030, -0.2963 for (MB, RTGS) respectively.

Concerning the magnitude of the estimated parameters, N1000 increase in the use of ATM innovation would yield 0.0308 percent increase in EPS. Likewise, also, a N1000 increase in the use of Internet Banking (IB) innovation would also bring about an increase of 0.5305 percent in the Earnings Per Share (EPS) of the listed deposit money banks (DMBs) in Nigeria. In addition, N1000 increase in Agent/POS Banking (APB) innovation will lead to an increase of 1.7714 percent in Earnings Per Share of the listed DMBs in Nigeria.

The significance of these results was ascertained with regard to IB and APB with the exception of ATM. This is because whilst the probability of the t-statistic for IB and APB is significant (lower than 0.05% level of degree of freedom), the t-statistic of ATM innovation is insignificant (greater than 0.05% significant level). This is because, there is evidence that the Internet Banking and Agent/POS Banking have significant positive relationship with Earnings Per Share of the listed deposit money banks in Nigeria (IB = 0.5305, t-test = 3.27, p -0.008 < 0.05 and APB = 1.7714, t-test = 2.51, p -0.031 < 0.05). This implies that IB and APB do not only have a positive effect on EPS of the listed DMBs in Nigeria but also have very significant influences on the EPS of the listed deposit money banks in Nigeria. The ATM in the order hand has a positive effect on EPS of DMBs in Nigeria. However, this positive influence is highly insignificant (ATM= 0.0308, t-test= 0.04, p -0.966 > 0.05).

In contrast, Mobile Banking (MB) and Real Time Gross Settlement (RTGS) innovation both have very significant negative effect on Earnings Per Share (EPS) of listed deposit money banks in Nigeria. This Indicates that N1000 increase in Mobile Banking Innovation will bring about 0.9030 percent decrease in the EPS while N1000 increase in RTGS will bring about 0.2963 percent decrease in the EPS of listed deposit money banks in Nigeria (MB= -0.9030, t-test = -2.38, p -0.04 < 0.05 and RTGS= -0.2963, t-test = -2.81, p -0.018 < 0.05).

Furthermore, the Adjusted R-square of the model is 0.215 and this suggests that 22% variations in corporate performance measure by Earnings Per Share (EPS) of the selected DMBs in Nigeria can be attributed to all the independent variables used in the study, while the remaining 78% variations in EPS are caused by other factors not considered in this model.

5.2. Decision

Based on the F-statistics ($F_{5, 10} = 254.96$) and the probability of F-statistics of 0.000 being less than the 5% chosen significant level of the study, this study decided that the null hypothesis for the model which states that "Financial Innovation does not have any significant effect on earnings per share (EPS) of listed deposit money banks in Nigeria" was rejected while the alternate hypothesis which states that "Financial Innovation significantly affected the EPS of listed deposit money banks in Nigeria" was accepted for the period under review.

6. Discussion of Findings

The objective ascertains the effect of financial innovation on earnings per share of listed deposit money banks in Nigeria. The result of the model for the objective two shows there is evidence that Automated Teller Machine Banking innovation, Internet Banking Innovation and Agent/POS Banking Innovation all have positive relationship with Earnings Per Share of DMBs. In contrast, Mobile Banking Innovation and Real Time Gross Transfer Settlement Innovation both have negative relationship with earnings per share of listed DMBs in Nigeria. In addition, there is evidence that Internet Banking Innovation, Agent/POS Banking Innovation Mobile Banking Innovation and Real Time Gross Transfer Settlement have significant relationship with Earnings Per Share of listed DMBs in Nigeria while ATM innovation has no significant relationship with Earnings Per Share of listed DMBs in Nigeria.

The result also concludes that there is a significant effect of financial innovation on earnings per share of listed DMBs in Nigeria. Also, the null hypothesis, that there is no significant effect of financial innovation on earnings per share of listed DMBs in Nigeria was rejected and the alternative hypothesis that there is a significant effect of financial innovation on earnings per share of listed DMBs in Nigeria was accepted. The acceptance of the alternative hypothesis, is in line with the *a-priori* expectation of the model two.

These findings of the study were consistent and confirmed the findings of other studies. The current study findings were consistent and in alignment with the findings of the study carried out by Ceylan, Emre and Asli (2018), which was aimed at examining the impact of internet banking on the financial performance in terms of profitability in Turkish banks. The finding of the paper showed that internet banking has a positive impact on the profitability, measured by EPS of banks in Turkey.

Also, the result of current study confirmed the conclusion of Cherotich, Sang, Shisia, and Mutung (2015) study objective, which was to establish the effect of financial innovation on financial performance of commercial banks in Kenya. Findings from the regression analysis showed that there is a strong relationship between financial innovations and earning capacity of the banks viz the returns to the shareholders. Financial innovation was found to positively affect financial performance

In contrast, the finding of the current study negated the findings of the study carried out by Michael, Ahmad, Hakeem, Mary-Jane and Babajide (2020), to examine the effect of electronic banking on bank performance in Nigeria. The findings revealed that e-banking measured by earnings per share (EPS) has no significant impact on the performance of banks in Nigeria. The study concludes that investment in electronic banking has not improved the performance of deposit money banks in Nigeria.

Also, the finding of the current study was in contrast with the finding of the study carried out by Mohammad, Riyardh and Saad (2011) where they found that electronic banking did not influence positively on bank performance measured by earnings per share (EPS). This finding was in sharp contrast with the finding of the current study. In addition, the finding of the current did not support the results of the study carried out by Antonnet (2014) on product innovation and its effects on financial performance of commercial banks in Kenya using EPS as a proxy. The multiple regression results showed a negative relationship between product innovation and EPS of commercial banks in Kenya.

7. Conclusion

From the analysis conducted, it was evident that there was a significant effect of financial innovation on earnings per share of listed DMBs in Nigeria. This was manifested by the positive association that was found between the independent and the dependent variables through empirical analysis.

8. Recommendations

Emanating from the findings, conclusions and contributions of the study, the following recommendations are made:

- The company's board of directors and management should take conscious effort in their strategies, policies and plans to ensure that the investment in financial innovation brings the desirable outcome of improving the financial performance of the DMBs in order to guarantee good return on equity by the investors of the banks.
- The government and the various regulatory bodies should put in place adequate policy measure regarding the availability and accessibility of the internet at the lowest cost possible. This is needed to encourage the banking populace on the full adoption of financial innovation at a minimal cost to them in term of internet data subscription and usage. This is the time that the full adoption of financial innovation is needed more than ever before as the advent of covid-19 has brought to the fore-front that the financial innovation is of utmost necessity.
- The introduction of fraud deterrent policies and controls to be put in place by the management of the DMBs to discourage the activities of fraudsters. Also, government should introduce stiffer penalty on fraudsters. The consequences of an action should be greater than the benefits to be derived from the action. This will enhance easy diffusion of financial innovation to the populace and ensure financial inclusion.
- In order to encourage the banking populace, the study also recommends that the Nigerian regulatory authorities and the bank management should develop a working strategy on quick resolution of customers' complaints with regard to insufficient cash, card failures, false debits, internet failures and general service failures being daily experienced by the banking population in Nigeria.
- The management of the deposit money banks should develop a training and enlightenment programmes in major Nigerian languages for the customers with regard to financial innovation, its benefits, risk exposure and physical. Constant training and retraining should be held for bank staff to keep them abreast of new developments as they evolve in this current technology era to improve the performance of deposit money banks in Nigeria.
- The management of deposit money banks should invest more in technological innovation as the spread and availability of the financial innovation such as the ATM will enhance usage, fees and commission to the banks.

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Appendix

List of Quoted Deposit Money Banks in Nigeria as at December 31st, 2020		
S/N	Name of Institution	Head Office Address
1	ACCESS BANK PLC	14/15, Prince Alaba Oniru Road, Victoria Island, Lagos.
2	FIDELITY BANK PLC	2, Kofo Abayomi Street, Victoria Island, Lagos
3	FIRST CITY MONUMENT BANK PLC	Primose Towers, 17a, Tinubu Street, Lagos
4	FIRST BANK NIGERIA PLC	Samuel Asabia House, 35 Marina, Lagos
5	GUARANTY TRUST BANK PLC	635, Akin Adesola Street, Victoria Island, Lagos
6	UNION BANK OF NIGERIA PLC	Stallion Plaza, 36 Marina, Lagos
7	UNITED BANK OF AFRICA PLC	57 Marina, Lagos
8	ZENITH BANK PLC	Plot 84, Ajose Adeogun Street, Victoria Island, Lagos
9	STANBIC IBTC BANK PLC	IBTC Place, Walter Carrington Crescent, Victoria Island, Lagos
10	STERLING BANK PLC	Sterling Towers, 20 Marina, Lagos
11	WEMA BANK PLC	Wema Towers, 54 Marina, Lagos Island, Lagos
12	ECOBANK NIGERIA PLC	21, Ahmadu Bello Way, Victoria Island, Lagos
13	UNITY BANK PLC	Plot 42, Ahmed Onibudo Street, Victoria Island, Lagos
Source: Nigerian Stock Exchange, 2020 (Now Nigerian Exchange Group)		

Table 2