

## Impact of Financial Technology on Financial Institutions' Performance. Evidence From Nigerian Commercial Banks

<sup>1</sup>Okoro, Chinonso Churchill, <sup>2</sup>Nnam, Hilary Ikechukwu, <sup>3</sup> Etukudo, Joe Wilson  
<sup>4</sup>Obizuo, Chinwendu Judith

<sup>1,3&4</sup>Department of Accounting, College of Management Sciences,  
Michael Okpara University of Agriculture Umudike. Umuahia, Abia State, Nigeria.

<sup>2</sup>Department of Accounting, Faculty of Management Sciences,  
Alex Ekwueme Federal University, Ebonyi State, Nigeria.

<sup>1</sup>Corresponding author's Email: churchillokoro@gmail.com

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### Abstract

*The study examined the impact of financial technology on financial institutions' performance. Evidence from Nigerian banks. The volume of ATM transactions, POS transactions and internet bank transactions were used to measure financial technology while liquidity ratio was used to measure financial performance. To achieve the objective of the study, ex-post facto was adopted. The data were collected through secondary source from CBN statistical bulletin. The data collected were analyzed using ordinary least multiple regression analysis. The result revealed that ATM transactions have positive impact on the performance of commercial banks in Nigeria. POS transactions have positive impact on the performance of commercial banks in Nigeria. Internet banking transactions have negative impact on the performance of commercial banks in Nigeria. In order to support the findings, the study recommends that financial institutions do more to entice their clients to use FINTECH products more regularly. This might be done through streamlining product usage, upholding product security, and guaranteeing product speed and efficiency. Clients will trust and embrace financial technology solutions after all of these conditions are met, which will eventually lead to profitability. Financial organizations should exercise caution while making technological investments. It is ludicrous to keep investing heavily in financial technology services if it is eventually difficult to pinpoint every component that affects performance and profitability. They should resist the impulse to spend more on useless financial innovations than their peers. The monetary and regulatory authorities should offer the proper safeguards for FINTECH users. To help clients feel less anxious about implementing financial technology solutions, businesses must also ensure that an efficient and dependable online monitoring system is in place.*

**Keywords:** Financial technology, ATM transactions, POS transactions and internet bank transactions, financial institutions.

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## 1.0 INTRODUCTION

Financial technology which is always written as Fintech is the combination of finance and technology. Financial services technology was founded by Citigroups in 1990s, which served as its foundation (Schueffel 2016). This revolutionary idea necessitates the development of a new financial paradigm that employs technology as a method of conveying a range of financial services, such as financing, financial-management, and settlement (Schueffel 2016). Electronic platforms such as mobile payments, point of sales (POS), automated teller machine (ATM), internet payments and transfer among others makes banking and business transactions easy. Particularly during the COVID-19 epidemic, the digital revolution replaced in-person interactions between financial service providers and clients with computerized networks (Feyen et al. 2021). The use of FinTech services including POS, ATM, mobile banking and internet banking have increased as a result of this tendency. As a result, as people change how they manage their accounts, traditional banking faces a serious threat (Hassan and Misrina 2021).

Financial institutions have greatly benefited from recent developments in financial technology. The usage of technology has made their operations efficient. Among other financial institutions banks are the major beneficiary to the adoption and use of financial technology. According to Dorfletner, Hornuf, Schmitt, and Weber (2017), financial technology is the modernization of financial services by businesses or their agents through the use of cutting-edge technology. FINTECH was made possible by financial technology (FinTech Weekly, 2016). In terms of account opening, deposit and withdrawal processes, online account statements, clearing and settlement, cash transfers, capital raising, credit processing and card services, FINTECH supports the banking industry. It also makes it easier to handle personnel records, carry out evaluations, and carry out audits. Financial technology helps banks in a variety of ways, according to Ogbeide-Osaretin and Ishiuwu (2015), including quick service delivery, consumer convenience, higher profitability, and increased market share.

Commercial banks in Nigeria's banking industry spent a lot of money on IT goods and services. Automated teller machines (ATM), points of sale (POS), mobile banking, and internet banking are the main Fintech services in Nigeria. The ease and convenience with which these technological services enable customers to conduct financial transactions will unavoidably have an impact on bank performance. Over 70% of all business expenses are spent by commercial banks on FINTECH, with 46% of the spending going toward organizational IT in Nigeria (CBN, 2009). Significant financial outlays and deliberate commitments are necessary for FINTECH to thrive. To enhance Nigeria's communication infrastructure, commercial banks constructed privately owned Very Small Aperture Terminals (VSATs) (Agboola & Salawu, 2008; Andoh-Baidoo and Osatuyi, 2009). Dauda and Akingbade (2011) claim that \$114 million is invested annually in IT by Nigerian commercial banks. Ekata (2011) reports that in 2009, commercial banks in the country spent more than \$105 million USD on IT and related services. Due to an increase in electronic fraud, this increased between 2018 and 2020 (Aduaka and Awolusi, 2020).

According to Fuster et al. (2019) and Chen et al. (2019), fintech companies have grown to be important providers of financial services to every country of the world. According to Ernst &

Young (2019), FinTech investment which was around \$9 billion in 2008 grew to around \$160 billion in the year 2018. It is noteworthy that around 50% of the top one hundred FinTech cities globally are located in developing nations. The growth of this sector is as a result of financial instability after the global financial crisis of 2007 and 2008. It was believed that conventional banking has failed and that is one of the contributory factor to financial crisis and instability. This business has the potential to expand more quickly due to the corona virus outbreak and the resulting demand for contactless banking transactions (Deloitte, 2020).

Financial technology in banking has changed the way payments are made in Nigeria. It has also enhanced automated clearing, check truncation, and expanded international remittance services. The volume and risk of financial transactions are reduced via fintech. Global development financing will soon be driven by technology (Okoye, Adetiloye, Erin, & Modebe, 2016). NDIC data from 2005 to 2021 demonstrates the strong performance and encouraging expansion of Nigeria's commercial banks. For instance, according to industry statistics, the ROA increased from 1.85% to 3.95% between 2005 and 2008, a startling 113.5%. It continued to fall until 2019 and 2020, when a 15.65% rise brought it to 2.3 and 2.66, respectively. Return on equity, a performance indicator for commercial banks, increased 162% exponentially from 22.01 to 57.65 between 2005 and 2010. Over the course of the examination, it did not demonstrate any discernible decline. In addition, interest income increased by over 100% both throughout the gap and the study period. Additionally, deposit money banks' non-interest revenue grew shockingly by 275.6% between 2005 and 2010 (Ibekwe, 2021).

However, it only fell a little before rising once more. Could it be argued that using financial technology products helped commercial banks' liquidity ratio (LR) performance generally improve? The goal of this study is to ascertain how, in light of this, financial technology affects the performance of Nigerian commercial banks. Through the usage of payment mechanisms (ATM, POS, and internet banking), the study examines the effects of financial technology on the Nigerian banking sector. Therefore, the study examines the extent to which financial technology (POS, ATM, and internet banking) affects banking sector performance (LR) since the emergence of e-payment system in Nigeria.

The specific objectives of the study include:

- (i) To determine the extent of the impact of ATM transactions on liquidity ratio of commercial banks in Nigeria.
- (ii) To examine the impact of POS transactions on liquidity ratio of commercial banks in Nigeria.
- (iii) To determine the extent of the impact of internet banking on liquidity ratio of commercial banks in Nigeria.

## 2.0 LITERATURE REVIEW

As a result of financial institutions' development of financial technology, bankable adults are becoming more financially included. Numerous studies have been done to ascertain how financial technology affect bank performance. The reader will learn more about financial technology and

how it influences bank performance as a result of this literature study. The study is supported by the innovation diffusion theory and the technology acceptance model. In order to inform the reader, a review of various earlier empirical research will be taken into account, along with academic arguments in support of Fintech adoption in the banking industry and how that would affect bank performance.

### **2.1. Financial Technology (Fin-Tech)**

According to Barbu et al. (2021), financial technology, is a term used to describe a variety of inventive services that are backed by improvements in communication and information systems. According to Abad-Segura et al. (2020), the financial technology sector consists of creative businesses that offer financial services while being heavily reliant on technology. They go on to describe how "technology" and "finance" were combined to generate the term "FinTech." According to Gai et al. (2018), FinTech is an example of how the financial services industry has adapted to technology. According to Zaghoul et al. (2021), finTech also includes the use of the internet and technological breakthroughs in the financial services industry. The financial industry will be transformed by the introduction of new strategies, products, technologies, and procedures through FinTech.

Fintech is the use of software and other technology, such as e-money, cash transfers, ATM/debit cards, credit cards and other payment processors, to enable financial transactions (Nurlaela et al. 2020). According to Nicoletti (2017), a few of the FinTech services that are currently offered include mobile payment, virtual currencies, e-commerce, risk management, portfolio management, specialized advising, and system integration. The emergence of fintech sector was as a result of the difficulties that consumers had in obtaining conventional financial services when the financial crisis of 2007 and 2008 (Knight and Wójcik 2020). Blockchains, near-field communication, mobile wallets, the Internet of Things, and artificial intelligence, among other cutting-edge technologies, are crucial for the future of banking (Lim et al., 2019).

According to Suseendran et al. (2019), the effect of these technologies on the expansion of FinTech services is now being assessed. According to Barbu et al. (2021), the growing relevance of the FinTech sector is mostly due to technological development, the merging of new processes with customized production, and the availability of round-the-clock financial services. Each of these components enhances the user experience. Nangin et al. (2020) assert that the development of financial business innovations in the delivery of financial services are directly impacted by fintech. Fintech businesses also place a greater emphasis on technology than do conventional financial institutions. Romanova and Kudinska (2016), claim that consumers can now easily, swiftly, and more affordably obtain financial services because to information technology. Both forward-thinking IT businesses and the conventional financial industry are embracing FinTech. The first category includes enterprises that use technology to offer new financial services, while the second category includes banks, brokerage firms, and insurance companies. Technology is used by both companies to improve the services they provide.

FinTech makes it possible for lenders and borrowers to communicate with one another online without using conventional banking infrastructure or procedures. Since financial services are being delivered using computers and other digital technology, it is anticipated that this industry would expand quickly and aggressively. Zaghoul et al. (2021) and Puschmann (2017), claimed that by

using IT to assess cutting-edge financial solutions, FinTech is helping the financial services sector become more digital. According to Naz, et al. (2022) on financial technology in developing country during the corona virus pandemic, the rise of digital platforms which has to do with financial technology helped businesses, services providers and service users to transact their businesses and other financial activities unconventionally. Most of the transactions were done electronically and that also helped the economy of these developing countries. Hassan and Misrina (2021) examined the potential for work-from-home opportunities in Islamic banking as well as how FinTech affects mobile banking during the epidemic. They discovered that people are compelled to adopt novel behaviors as a result of Islamic financial institutions employing FinTech more frequently, such as mobile banking, which has recently attracted popularity.

## **2.2. Financial Technology in Banks**

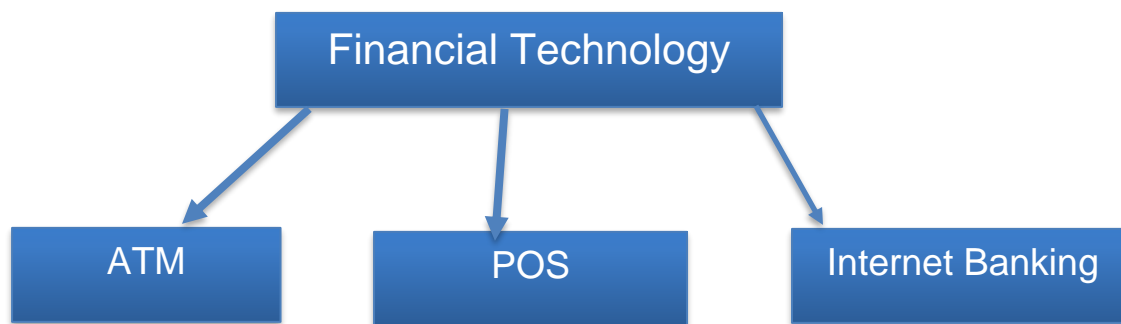
Governments, regulators, regulatory agencies, and specialists have all shown a significant lot of interest in FinTech due to its disputed status (Naz, et al.2022). According to Fernando and Dharmastuti (2021), the decline in high-interest loans brought on by fintech is what drives the sector's growth across the country. To support this assertion even further, they noted that FinTech ensures secure money management for users. Also, Petralia et al. (2019) pointed out that the growth of fintech has a big impact on the banking industry's current business models. Capital raising, deposits, payments, and investments are only a few of the financial areas where fintech has had an impact (Nguyen, 2022).

According to Cornelli et al. (2020), the central banks are beginning to take FinTech data into account when making financial policy decisions and monitoring financial and economic situations. One example of this is loan volume. According to Cheng and Qu (2020), one of two ways that fintech could have an effect on traditional banks is through the use of technology in interactions between banks and fintechs as well as between banks and companies outside of the fintech industry. De Roure et al. (2021) highlighted the competitive nature of FinTech and traditional financial institutions and underlined how these factors affected the risk-taking, innovation, and success of the latter. Regulatory concerns were initially brought up in the study by Buchak et al. (2018) on the impact of FinTech loans on bank performance. Chen et al. (2019) and Nguyen (2022), in their studies show how FinTech can enhance financial services by encouraging low-cost transactions, extending business models, and raising the quality of service. Fintech, according to Yao and Song (2021), may be able to aid commercial banks in their efforts to diversify. According to Li et al. (2017), there is a connection between the growth of FinTech activity and bank stock returns. Customer demand as well as disruptive innovation have so far been taken into account. The banking sector may be impacted by the growth of fintech. Based on the consumer demand idea, new financial institutions will be replaced when FinTech satisfies consumer need.

On the other side, the disruptive-innovation theory suggests that new market entrants acquire cutting-edge technology and use them to provide services that are easily accessible and affordably priced (Nguyen, 2022). The customer hypothesis, according to Yudaruddin (2022), explains how FinTech businesses replace outdated banking services to satisfy client demand. According to the disruptive innovation idea, FinTech businesses compete aggressively with traditional banks by generating revenue from innovative technologies designed to give customers quick and affordable access to services. According to Juengerkes (2016), collaborating with FinTech firms can benefit

banks by improving their ability to handle disruptive innovation and promote client confidence. Cheaper mobile payments are another advantage of fintech, according to Nguyen (2022). According to Abdul-Majid et al. (2017), there are differences between how Islamic and conventional banks employ technology. Yударuddin (2022) claims that Islamic banks are less inventive and spend more money on Sharia specialists than conventional banks. Furthermore, Islamic financial institutions, according to Panjwani and Shili (2020), rarely innovate. According to research by Ali et al. (2019), the Islamic banks also adjust to the influence of FinTech more gradually than conventional banks do.

### 2.3. TYPES OF FINTECH



**Figure 2.1: Forms of Financial Technology.**

Automated teller machines (ATMs), point of sales (POSs), and internet banking are the main types of financial technology used in this study. Below is an explanation of several financial technology types.

#### 2.3.1 Automated Teller Machine (ATM) and bank performance

The method that is still most frequently utilized to pay financial transactions and obligations is actual cash. However, especially in advanced economies, cash transactions are declining in frequency (Amedu, 2005). In contrast to Europe, where cash is still often utilized, in the United States, cash still represents 50% or more of all transactions. Obviously, cash is not a form of electronic payment. The ATM, an electronic gadget, has, nevertheless, lessened the need for physical cash transportation and bank visits. An ATM or cash dispenser can be used by a bank customer to withdraw cash, and the account is quickly debited.

One major benefit is that it is not need to be located on the property of a banking facility (Gomber, Koch, and Siering, 2017). It is widely seen, among other places, at supermarkets, shopping centers, and gas stations. The card this ATM uses is a Chip device, which consists of circuitry on a single silicon chip. An intricate circuit known as a "card" employs a single chip that houses the whole computer's arithmetic and logic unit to handle microprocessors. It let bank customers to check their balances, make mini-statements, cash withdrawals, and transfer funds using automated teller machines. Despite the fact that ATM transactions are considerable, there are a few factors that reduce their effectiveness.

According to Navaretti, Calzolari, Mansilla-Fernandez, and Pozzolo (2017), a lone perpetrator often uses a weapon against a lone victim in most robberies. Most of them include withdrawing money from clients who have previously asked for withdrawals. Drive-through ATMs are less likely to be the target of a robbery than walk-up ATMs. Furst et al. (2005) assert that there are numerous and varied patterns of ATM robberies, and that each one presents unique challenges for defenders. The most typical pattern is for the offender to rob the ATM user immediately following the victim's money withdrawal. The offender forces the victim to withdraw money from an ATM. Despite these difficulties, using an ATM is necessary for simple banking and business activities. There has been a constant increase in ATM usage which also enhance the performance of banks. Thus, the following hypothesis is states:

*H1: ATM transactions have no positive and significant impact on the performance of commercial banks in Nigeria.*

### **2.3.2 Point of Sales (POS) and bank performance**

The point of sales is the process where financial transactions/activities such as payments and transfers are made at the point of the business transactions. In this case, bank users are given electronic cards that can be inserted into specialized e-machine to make payments. A point of sale (POS) terminal serves as the central component of such a payment system (Azeez, 2011). These will be used by businesses all around the country. These POS terminals will function like ATMs once they are installed. In this case, after a transaction is finished and the value has been established, the amount is input into a POS terminal where the electronic card has been inserted. The payer's account is debited and the corresponding amount is credited to the payee's account. Each user receives a card that acts as their digital wallet. The electronic purse can be refilled using revaluation terminals. Coin-and-note, credit card, and payroll deduction terminals are the three primary types of terminals. Money is added to the digital wallet after placing the cards in the revaluation terminal and going through a few required steps (Olaegbe, 2011). This information is entered into POS terminals to make purchases of products and services. The money is immediately removed from the e-purse (the card) after placing the card into the reader and entering the transaction amount.

According to Mbiti & Weil (2011), the cashless economy comes with cost attached to it. In addition to the 5percent commission on turnover that banks are allowed to charge whenever money is transferred out of our accounts under CBN regulations, using the POS unexpectedly entails a significant cost of 1.25 percent of the price of each transaction or purchase made (Omore, 2011). Since its inception, the POS business has been more and more well-liked because it makes life easier for both customers and financial institutions. ATM cards can be used to transfer and receive money using POS terminals. The government's goal of going cashless and the banks' attempts to boost bank efficiency are both hampered, according to the Nigerian Inter Bank Settlement System (NIBSS).

The biggest problem with POS terminals (cardholders) is the delay in credit being reversed to account owners. Additionally, POS software faults can make it possible for customer data to be stolen. However, from 2010 to the present, the number of financial technology components such

as ATMs, POS systems, and Internet banking has gradually expanded. The increase in Nigerian ATM, POS, and Internet banking transaction volume is depicted in Figure 2.2 below. From 60 million transactions in 2010 to 1.4 billion in 2020, there were a lot more ATM transactions. Due to this, rather of their being 1 million POS transactions in 2010, there were 570 million in 2020. From 1.2 million transactions in 2010 to 394 million naira in 2020, the volume of internet banking transactions increased considerably (CBN, 2020). This increase has led to proportional increase in bank performance. Thus, the following hypothesis is states:

*H2: POS transactions have no positive and significant impact on the performance of commercial banks in Nigeria.*

### **2.3.3 Internet Banking and bank performance**

Sarma (2016) asserts that these solutions make it possible for bank customers to use their websites without being constrained by the need for faxes, phone confirmations, original signatures, or letter-writing. It consists of using the internet (www) to perform financial transactions rather than going to the banking hall with the aid of technological gadgets like computers (Petralia, et al., 2019). This serves as a payment method in addition to considerably simplifying online shopping. Payments are made by customers using contact or contactless cards, much like mobile banking (Sarma 2008; 2016). Online debt repayment and the purchase of airline tickets rank as the two most common internet transaction kinds. It is necessary to increase awareness of and use of cashless banking because a sizeable section of the population is ignorant of the benefits of online transactions (Siyanbola, 2013).

According to Asare and Sakoe (2015), internet banking enhanced bank productivity as well as transaction volume, cashier productivity, customer retention, service delivery, client services, and all other elements of bank services. By cutting operating expenses for banks and enabling them to run with fewer employees and faster, more efficient services, electronic banking has increased the number of people in Ghana who have access to financial services. Users can carry out services including money transfers, airtime top-ups, balance checks, password resets, and bill payments through the Internet banking platforms. Services for online banking offer benefits and drawbacks. However, consumers and marketers must be aware of changing banking practices, security risks, logistical difficulties, a break in personal ties, and the transforming financial landscape. Therefore the internet banking has the tendency of affecting bank performance either negatively or positively. Thus, the following hypothesis is states:

*H3: Internet banking transactions have no positive and significant impact on commercial bank performance in Nigeria.*



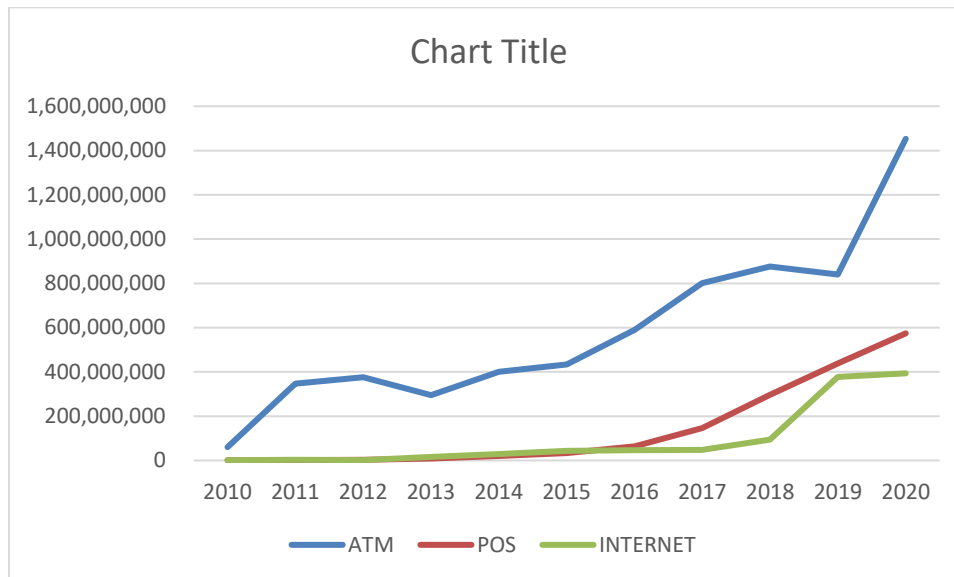


Figure 2.2: Graphical data on the components of financial inclusion in Nigeria

## 2.4 Role of financial technology in bank performance

The term "FinTech" refers to financial innovation that banks develop for their own products or services without working with start-ups or non-bank FinTech firms, according to the European Banking Authority (2019). It is important to highlight the three stages of financial innovation in the banking sector (Cheng & Qu, 2020). Up until 2010, online banking served as the best example of progressive banking. Between 2011 and 2015, mobile banking was developed and added to online banking. Big data, distributed technology, and other emerging technologies also started to gain popularity in 2015 (Wang et al., 2021).

Innovative FinTech companies have mushroomed in recent years. FinTech innovations are becoming more well-known and in the spotlight on a worldwide scale, but it is unclear how these advancements will impact the banking sector and traditional business models (Chen et al., 2019). Two opposing theories about how financial innovation affects the economy are the "innovation-growth" hypothesis and the "innovation-fragility" theory. According to Lee et al.'s "innovation-growth" theory, which was put forth in 2021, Fin-Tech companies have a positive influence on bank performance because financial innovation can boost banks' capacity for risk distribution and promote the efficient use of resources. The major reason for the adoption of Fin-Tech is remedy the challenges of traditional banking. Due to strict rules, traditional banks frequently have issues when providing loans (Zhao et al., 2022). The market share of traditional financial institutions has decreased as a result of the rise of shadow banks and FinTech lenders (Buchak et al., 2018).

## 2.5 THEORETICAL REVIEW

### 2.5.1 Innovation Diffusion Theory

Rogers created the Innovation Diffusion Theory in 1962. The goal of this theory is to comprehend and describe how people can accept a new concept, technology, service, or item. Five characteristics relative benefit, compatibility, complexity, trialability, and observability were

created by Rogers to provide a rationale for why innovations are accepted scientifically. A particular innovation with a low level of complexity is hence more adaptable when it is voluntarily adopted. This paper contends that organizations, in particular banks and financial institutions, must reexamine their business models in order to improve the experience of adopting innovations. Employees can utilize them and adjust to them without experiencing any significant change resistance, on the one hand. However, the client can quickly and simply employ this technology. Moore and Benbasat (1991) assert that innovations must also have measurable effects and a considerable benefit. A person is more likely to reject an invention if they are made to utilize it against their will. There is a clear link between voluntarism and the successful adoption of information technology, according to Agarwal and Prasad (1997). The user experience must be improved by the inventive solution. Without a doubt, fintech has changed how people conduct in-person banking. Fintech usage has increased as a result of consumers' appreciation for having free, round-the-clock access to a range of banking and financial services via their smartphones.

According to the Fintech Adoption Index Report (2017), the average adoption rate of fintech is currently 33% globally, up from 15% in 2015. A few advantages that fintech companies provide include reasonable pricing, round-the-clock online support, and other financial services that are extremely in line with user values, especially those of digital natives. Fintech services are incredibly simple to use, and we can test them out without incurring any costs before purchasing them, allowing us to start benefiting from them right away. People are embracing fintech voluntarily rather than under coercion thanks to the use of social media and web 2.0 platforms. These people are part of a group that encourages the use of innovation and ICT, which is primarily comprised of members of generations Y and Z. The bulk of Rogers' criteria for understanding innovation adoption are met by fintech. Numerous constructs are suggested by another theoretical model for such adoption.

### **2.5.2 Technology Acceptance Model (TAM)**

Technology acceptance model was propounded by Davis in 1989. This theory was propounded to predict the degree of acceptability of a new technology. The hypothesis put forward by Fishbein and Ajzen serves as its foundation. The TAM model aims to pinpoint the process adjustments required to make this new technology more user-friendly and accepted. Although the new system is straightforward, consumers must first acknowledge its advantages and ease of use before accepting it. The user will, therefore, favor the system that is simpler to use when two systems have the same capabilities (Dillon and Morris, 1996). The more easily a user can use a system, the higher their self-efficacy, infers Bandura's (1982) theory. This will ease and increase the flexibility of adopting this new technology or system.

The acceptability of a new technology is assessed using Nielsen's (1993) methodology, which combines social and practical acceptability aspects. A new technology's social acceptability depends on how it is used, what it can do, and how well it complies with social norms established by a group of people, a business, or an organization. For instance, using a cutting-edge technological approach to enhance traffic weapons control is socially unacceptable. Given the significant factors that influence and explain the innovation's actual utility, such as technological compatibility, product/service cost, product/service reliability, and usefulness of the technological innovation, practical acceptability should be emphasised more.

Neilson asserts that the concepts of utility and usability can be used to divide the concept of "Usefulness" into two subcategories. Usability is concerned with how easily a good or service may be utilized; utility is concerned with how well it works. Utility, in the words of Senach (1990), "determines whether the system allows the user to execute his work if he is able to achieve what the user requires." Senach (1990) stated that "Utility encompasses functional capability, system performance, and support characteristics". The International Organization for Standardization's (ISO, 1998) definition of usability is becoming more widely accepted as a standard. They defined usability as the level of usage of a product or service by particular users to accomplish particular goal (Jokela et al., 2004).

## **2.6 Empirical review**

Dermaku et al., (2023) examined the relationship between fintech developments and the performance of Kosovo's banks. 49 observations that were recorded at regular intervals of three months. The source of data is secondary data. Net profit of the selected banks were used as proxy for performance while ATMs, POS, and e-payments were used as the proxy for fintech. The methodology used in the study is based on the OLS approach and diagnostic tests for assessing heteroscedasticity, specification error, autocorrelation, and multicollinearity. The findings indicate that the net profit of the banks is regulated by the unpredictability of ATMs and electronic payments. ATM payments negatively affect bank net profit, whereas e-payments positively affect bank net profit. In addition, a rise in ATM payments reduces bank net profit by 0.30%. While a rise in e-payments by 1percent rise in bank net profit by 0.10%. The POS payments negatively affect bank net profit.

Adiga et al. (2022), looked at the effect of fintech on Nigeria banking sector performance. The study's data sources included the CBN, data and reports from the Nigeria Deposit Insurance Corporation from various years. Using the Auto Regressive Distributed Lag method, the study examined the relationships between the fintech (the payment system, automated clearing services, and remittance services), and performance (such as ROA and ROE). According to the study's findings, financial technology significantly affect performance (ROA, ROE).

Xu (2022) examined the role of fintech adoption in banking industry. The indicator of the CAMEL rating system is used in this article to analyze the role of FinTech and bank performance. The study was carried out using 45 commercial banks in Europe from 2015 to 2021. Data were collected from annual report and account of these selected banks. The findings imply that bank FinTech plays a significant role in maintaining adequate capital, top-notch assets, effective management, large income potential, and liquidity. Adopting bank FinTech often benefits banks.

Ibekwe (2021) studied the performance of banks and financial innovation in Nigeria. Secondary sources were employed to gather the information using CBN data. ROA was used to evaluate performance and ATM, POS, mobile banking, and online banking were used to measure financial innovation. The collected data were examined using unit roots and the OLS-regression. The results demonstrated that ATM, POS, and internet banking have a favorable impact on Nigerian banks.

Aduaka and Awolusi (2020) looked at the relationship between e-banking (Fintech) on profitability of banks in Nigeria. To achieve the objectives of the study, both secondary and primary data were adopted. The primary data involves surveys while secondary data involves banks' audited financial records. The data collected were subjected to some pre-estimation test.

However, the hypotheses were tested using multiple regression and the results revealed that e-banking have significant effect on bank profitability.

Kshitika, Meena, Vinutha, and Kavitha (2019) investigated the impact of Fintech on the profitability of banks. To evaluate the impact of working with FinTech firms, the study looked at the profitability of some selected banks from the previous year. A secondary set of data was used in the study. The investigation employed both the test for normality and pairwise t-tests. The outcomes reveal an increase in profit trend for the selected banks as a result of adoption of Fintech.

### **3.0 METHODOLOGY**

This is the study's methodology section. The methods and procedures that were used to gather and analyze the study's data are described in this section.

#### **3.1 Research Strategy**

To evaluate the effect of financial technology on the performance of financial institutions, a conceptual framework was built using information from the Central Bank of Nigeria's (CBN) monthly bulletin. The literature review that came before this tactic served as a foundation. The ATM, point of sale, and mobile banking were utilized as financial technology indicators in this study, which used the same technique as Adiga et al. (2022) and Ibekwe (2021) for a quantitative analysis of the effect of financial technology on bank performance.

The identification of a thorough multi-strategy approach to studying the impact of financial technology on bank performance is made possible by combining this method with Aduaka and Awolosi's (2020) quantitative methodology, which looked at the impact Fintech has on bank performance (Wilson, 2013). This study also refers to the work of Adiga et al. (2022), which employed multiple regression analysis to try to ascertain how financial technology impacts bank performance. Similar to the research by Kshitika et al. (2019), this study examined each of the components over the previous 13 years to see if there have been any changes in bank performance as a result of the advancement of financial technology.

#### **3.2 Research Design and Measurable Concepts**

The approach utilized in this study, which was ex-post research design-based, was used to collect and analyze empirical data. As a result, we only used secondary data for our research. Financial technology was assessed using ATM transactions, ATM transactions, and more ATM transactions; bank performance was assessed using the liquidity ratio. In order to understand how financial technology operations may influence the liquidity (cash and cash equivalent) of commercial banks, liquidity ratios are used to assess performance. Money and its equivalent being accessible might also encourage Fintech activity.

#### **3.3 Sources of data**

The yearly time series figures for this study, which spanned the years 2010 through 2022, were given by the CBN statistical bulletin. The information gathered includes information on the amount of ATM, POS, and internet banking transactions as well as the liquidity ratio of Nigeria's commercial banks.

#### **3.4 Data Analysis**

Version 9 of the econometrician viewpoint (E-view) was used to analyze the data. The primary methods used in the data analysis were descriptive analysis and inferential analysis. Summary data

including mean, median, standard deviation, frequency distribution, and percentage distribution were provided using descriptive analysis (Gujarati, 2003). Multiple regression analysis was used for data analysis and test of hypotheses.

### 3.5 Model Specification

The suitable model for the study is stated below:

$$LR = \beta_0 + \beta_1ATM_t + \beta_2POS_t + \beta_3INTERBANK_t + \mu$$

Where:

LR = Liquidity ratio

ATM = Automated Teller Machine.

POS = Point of sale

INTERNET = Internet banking

$\beta_0$  = Constant term,  $\beta_1 - \beta_3$  = Coefficient of ATM, POS and INTERNET and  $\mu$  = Error term.

VARIABLES	DEFINITION	TYPE	MEASURE
ATM	Automated Teller Machine	Independent	Total amount of ATM transactions that took place in Nigerian banks from 2010 to 2022
POS	Point of Sales	Independent	Total amount of POS transactions that took place in Nigerian banks from 2010 to 2022
INTERNET	Internet Banking	Independent	Total amount of internet banking transactions that took place in Nigerian banks from 2010 to 2022
LR	Liquidity ratio	Dependent	Current asset divided by current liability.

**Note:** This table shows the abbreviation, definition and measurements of the variables used in this study.

## 4.0 RESULTS AND DISCUSSIONS

### Introduction

In this chapter, a regression analysis was done to determine the impact of financial technology on the performance of financial institutions. Evidence from commercial banks in Nigeria. Bank liquidity was used to evaluate the dependent variable (financial performance), while the number of ATM, POS, and internet banking transactions were used to measure the independent variables (financial technology). Due to a shortage of data, the analysis could only cover the thirteen (13) years from 2010 to 2022. The modified R square, coefficient of determination, and F statistic were used in this study to evaluate the model's overall applicability. The F- and T-statistics were used to analyze the relationship between the variables. The data for the various variables are graphically shown below while the figures are shown as an appendix.

### 4.2 PRE-ESTIMATION TESTS

#### 4.2.1 Descriptive Statistics

**Table 4.2: Descriptive Statistics table**

	ATM	POS	INTERNET	LR
Mean	8.745330	7.803784	7.842689	56.77154
Median	8.771028	7.804243	7.672590	49.72000
Maximum	9.203899	9.589478	10.14811	104.6000
Minimum	7.779117	6.030367	6.063158	27.39000
Std. Dev.	0.385149	1.167003	1.251819	21.08446
Skewness	-1.022176	-0.021461	0.529984	0.878307
Kurtosis	4.074193	1.844464	2.529474	3.148121
Jarque-Bera	2.888851	0.724266	0.728503	1.683299
Probability	0.235882	0.696190	0.694716	0.430999
Sum	113.6893	101.4492	101.9550	738.0300
Sum Sq. Dev.	1.780080	16.34275	18.80461	5334.653
Observations	13	13	13	13

Source: E-View Output in appendix 2

The results of the descriptive or summary statistics for several variables (including ATM, POS, Internet, and LR) are displayed in the descriptive table above. It is crucial to keep in mind that the raw data utilized for the summary statistics were used for the regression analysis in their original,

undisturbed condition to assess their structure. The metrics of central tendency, dispersion, and normality of the data set were contrasted using the summary statistics. The minimum value, the maximum value, and the standard deviation were used as measures of dispersion in this investigation. The dataset for ATM, POS, INTERNET, and LR had lowest values of 7.779117, 6.030367, and 6.063158 and highest values of 9.203899, 9.589478, 10.14811, and 104.6000, according to the E-view report. The mean and median values of the data set were compared using measures of central tendency. Unlike the mean, which was based on the average values of the variables, the median focused on the middle of the distribution of the variables. According to the data analysis, the corresponding mean values for ATM, POS, Internet, and LR were 8.745330, 7.803784, 7.842689, and 56.77154, respectively.

The normality test establishes the normal distribution of the data set. In this study, skewness and kurtosis were investigated as signs of normalcy.

The Jarque-Bera (JB) test is used to compare the series' skewness and kurtosis to those of the normal distribution. The series' normal distribution is the null hypothesis for JB statistics. The JB values for ATM, POS, INTERNET, and LR are 2.888851, 0.724266, 0.728503, and 1.683299, respectively, based on the results in table 4.1 above, with corresponding p-values of 0.235882, 0.696190, 0.694716, and 0.430999. Since all of the variables in this research have P-values greater than 0.05 (5%) the null hypothesis that there is no autocorrelation is accepted. This shows that the data gathering did not involve any autocorrelation.

#### 4.3 DATA ANALYSIS

**Table 4.3 Regression Result**

**Dependent variable: LR**

Variables	Coefficient	Std-error	T-statistics	Probability
<b>C</b>	-130.6758	169.9246	-0.769022	0.4616
<b>ATM</b>	12.10826	26.07352	0.464389	0.6534
<b>POS</b>	11.58088	17.35442	0.667316	0.5213
<b>INTERNET</b>	-1.124368	13.56059	-0.082914	0.9357
<b>R-Square</b>	0.611028			
<b>Adjust.R-Square</b>	0.481371			
<b>F-statistics</b>	4.712645			
<b>Prob.(F-statistics)</b>	0.030467			
<b>Dubin-Watson</b>	1.892068			

**Source: E-View Output in appendix 4**

The influence of financial technology (ATM, POS, and Internet banking) on the financial performance of banks in Nigeria is demonstrated by the results of the ordinary least square multiple regression in table 4.3. According to the R-square of 0.611, the explanatory variables (volume of ATM transactions, volume of POS transactions, and volume of internet banking transactions) are

responsible for 61.1% of the total variation in the dependent variable (LR), leaving 38.9% of the variation unaccounted for. The remaining 38.9% may be explained by additional elements or variables not included in the model. When the R-square value is positive, performance has a favorable link with ATM, POS, and online banking transactions. The adjusted  $R^2$  of around 0.481 suggests that this result will depart from the model by just 0.11 (i.e.,  $0.611 - 0.481$ ) if additional factors are taken into account. This outcome indicates that there will be an additional 11.0% deviation in the variation brought on by independent variables.

The ATM's positive co-efficient value of 12.10826 indicates that a current increase in ATM transaction volume will result in an increase in bank performance (as assessed by LR) of roughly 12.10826%. This meets the a priori assumptions that a rise in ATM usage will result in an improvement in bank performance. We infer that bank performance is inelastic with respect to ATM transactions because the proportionate change in bank performance is less than the proportional change in ATM. In a similar vein, the POS co-efficient has a positive magnitude of 11.58088. This suggests that a 1% increase in POS transaction volume results in an increase in bank performance of roughly 11.58088%. since of this, it may be said that bank performance is inelastic with respect to POS transactions since the proportionate change in bank performance is also smaller than the proportional change in POS.

Internet banking's coefficient has a negative magnitude of 1.124368. This suggests that a 1% increase in the number of online banking transactions causes a decline in bank performance (LR) of around 1.124368.

#### **4.4 TEST OF HYPOTHESES**

##### **Hypothesis one**

**H1:** *ATM transactions have no positive and significant impact on the performance of commercial banks in Nigeria.*

To test the hypothesis: The T-statistic of 0.464389 with a p-value of 0.6534% level of significance. Because the F statistics are greater than a 5% level of significance, we would accept the null hypothesis. It can be concluded that ATM transactions have positive but insignificant impact on the performance of commercial banks in Nigeria. The ATM has a positive co-efficient value of 12.10826 indicating that a present increase in the volume of ATM transactions will lead to about 12.10826% increase in bank performance (measured using LR). This satisfies the a priori expectations which state that increase in ATM transactions will lead to an increase in bank performance. Therefore, the proportional change in bank performance is less than the proportional change in ATM. The findings are in line with those of Monyoncho (2018), who suggested that the proliferation of ATMs and the introduction of Mastercards significantly facilitated customers' access to formal financial services. The study's presumptions indicate that e-banking has a favorable impact on financial inclusion in Kenya, and it is advised that deposit money institutions continue to invest in the advancement of automated teller machines for effectiveness.

##### **Hypothesis two**

**H2:** *POS transactions have no positive and significant impact on the performance of commercial banks in Nigeria.*

To test the hypothesis: The T-statistic of 0.667316 with a p-value of 0.5213% level of significance. Since the p-value of 0.5213 (greater than 5%) statistically insignificant at 5%, we would accept



the null hypothesis. As a result, POS transactions have a positive but insignificant impact on the performance of commercial banks in Nigeria. Similarly, the co-efficient of POS is positive with a magnitude of 11.58088. This implies that a 1% increase in the volume of POS transactions leads to about 11.58088% increase in bank performance (LR). Since of this, it may be said that bank performance is inelastic with respect to POS transactions since the proportionate change in bank performance is also less than the proportional change in POS. The findings are in line with those of Marouane and Qmichcho (2020), who found that FinTech transactions (like POS transactions) improve social and financial inclusion by giving the excluded population easy-to-use digital financial services (DFS). Thus, this has an impact on bank performance.

### **Hypothesis three**

**H3:** *Internet banking transactions have no positive and significant impact on the performance of commercial banks in Nigeria.*

To test the hypothesis: The T-statistic of -0.082914 with a p-value of 0.9357% level of significance. Since the p-value of 0.5213 (greater than 5%) statistically insignificant at 5%, we would accept the null hypothesis. As a result, internet banking transactions have both negative and insignificant impact on the performance of commercial banks in Nigeria. The co-efficient of internet banking is negative with a magnitude of 1.124368. This implies that a 1% increase in the volume of internet banking transactions leads to about a -1.124368 decrease in bank performance (LR). The outcome is different from the outcome of Internet banking improved bank productivity along with transaction volume, cashier productivity, customer retention, service delivery, client services, and all other aspects of bank services, according to the results of Asare and Sakoe (2015).

## **5.0: CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Conclusion**

The study examined the impact of financial technology on financial institutions' performance. Evidence from Nigerian banks. Secondary data and a quantitative method were employed in the study. The information was produced using the bulletin from the Nigerian central bank. The data were subjected to a multiple regression analysis using the statistical program E-view. The findings from the analysis revealed the following:

- (i) ATM transactions have positive impact on the performance of commercial banks in Nigeria.
- (ii) POS transactions have positive impact on the performance of commercial banks in Nigeria.
- (iii) Internet banking transactions have negative impact on the performance of commercial banks in Nigeria.

### **5.5 Recommendations/policy implementation**

In order to support the findings, the study recommends that financial institutions do more to entice their clients to use FINTECH products more regularly. This might be done through streamlining product usage, upholding product security, and guaranteeing product speed and efficiency. Clients will trust and embrace financial technology solutions after all of these conditions are met, which will eventually lead to profitability.

Financial organizations should exercise caution while making technological investments. It is ludicrous to keep investing heavily in financial technology services if it is eventually difficult to pinpoint every component that affects performance and profitability.

They should resist the impulse to spend more on useless financial innovations than their peers. The monetary and regulatory authorities should offer the proper safeguards for FINTECH users. To help clients feel less anxious about implementing financial technology solutions, businesses must also ensure that an efficient and dependable online monitoring system is in place. Better financial technology transactions are assured by a strong monitoring and control system. Additionally, it will attract more consumers, enhancing the operation of the financial sector.

Financial institutions should investigate alternate revenue streams because it has been demonstrated that they cannot rely on financial technology to assure profitability and improved performance.

## REFERENCES

- Abdul-Majid, M., Falahaty, M. and Jusoh, M.. (2017). Performance of Islamic and Conventional Banks: A META-Frontier Approach. *Research in International Business and Finance* 42: 1327–35.
- Adiga D.L., Adigwe, P.K., Okonkwo, V.I., Ogbonna, S.K. (2022). Financial technology and the banking sector performance in Nigeria (2005-2020). *Discovery*, 2022, 58(316), 349-360
- Aduaka, U. and Awolusi, O. D. (2020). Electronic Banking and Profitability in the Nigerian Banking Industry. *Information Management and Business Review*, 12(1)
- Agarwal, R. and Prasad, J. (1997). The role of innovation characteristics and perceived voluariness in the acceptance of innovation technologies. *Journal of Decision Sciences*, 28(3), 557-582.
- Agboola, A. A. and Salawu, R. O. (2008). Optimizing the Use of Information and Communication Technology (ICT) in Nigerian banks. *Journal of Internet Banking*, 13(1), 1-15.
- Amedu, O.(2013): Electronic payment systems and Economic Growth: A Review of Transaction to Cashless Economy in Nigeria. *International Journal of Scientific Engineering and Technology*, 2(9), 913-919. Publishers Ltd. London
- Asare, M. and Sakoe, J.(2015), Understanding Adoption and Continual Usage behavior Towards Internet banking Services in Hong Kong, (Unpublished Master of PhilosophyThesis), Lingnan University, Hong Kong. Commerce/Jibc/01030.
- Azeez, O. (2011): Operations cashless. An article published in the leadership Newspapers, Wednesday, 22, June: 27.

- Barbu, C., Florea, D. Dabija, D. and Barbu, M. (2021). Customer Experience in Fintech. *Journal of Theoretical and Applied Electronic Commerce Research* 16: 1415–33.
- Chen, M. A., Wu, Q., and Yang, B. (2019). How valuable is FinTech innovation? *The Review of Financial Studies*, 32, 2062–2106.
- Chen, M., Wu, Q. and Yang, B. (2019). How Valuable is Fintech Innovation? *Review of Financial Studies* 32: 2062–2106.
- Cheng, M., and Qu, Y. (2020). Does Bank Fintech Reduce Credit Risk? Evidence from China. *Pacific-Basin Finance Journal* 63: 101398.
- Dermaku, H., Hajdari, M., Dermaku, K. and Hoti, L. (2023). An empirical analysis of Fintech's impact on financial performance of banks in Kosovo. *Journal of Emerging science*, 7(3), 890-896.
- Dillon, A.P., and Morris, M. G. (1996). User Acceptance of Information Technology: Theories and Models. *Annual Review of Information Science and Technology*, 31, 3-32.
- Dorfleitner, G., Hornuf, L., Schmitt, M., and Weber, M. (2017). Definition of FinTech and Description of the FinTech Industry. *FinTech in Germany*, 5-10
- Ernst and Young (2019). Global FinTech Adoption Index. Accessible at: [https:// www. ey. com/ en\\_au/ ey- global- finte ch- adopt ion- index](https://www.ey.com/en_au/ey-global-fintech-adoption-index).
- Fernando, F., and Dharmastuti, C. (2021). Fintech: The Impact of Technological Innovation on the Performance of Banking Companies. *Paper Presented at the Second Asia Pacific International Conference on Industrial Engineering and Operations Management*, Surakarta, Indonesia, September 14–16.
- Feyen, E., Frost, J. Gambacorta, L. Natarajan, H. and Saal, M. (2021). Fintech and the Digital Transformation of Financial Services: *Implications for Market Structure and Public Policy*. *BIS Papers*. Basel: BIS.
- FinTech Weekly (2016). FinTech Definitions. Retrieved from <https://www.fintechweekly.com/fintech-definition>
- Fuster, A., Plosser, M., Schnabl, P., and Vickery, J. (2019). The Role of Technology in Mortgage Lending. *The Review of Financial Studies*, 32(5), 1854–1899.
- Fuster, A., Plosser, M., Schnabl, P., and Vickery, J. (2019). The role of technology in mortgage lending. *The Review of Financial Studies*, 32, 1854–1899.

- Gai, K., Qiu, M. and Sun, X. (2018). A Survey on FinTech. *Journal of Network and Computer Applications* 103: 262–73.
- Gomber, P., Koch, J. A., and Siering, M. (2017). Digital Finance and FinTech: current research and future research directions. *Journal of Business Economics*, vol. 87, no.5, pp.537-580,
- Hassan, N., and Misrina, A. (2021). Impact of Fintech on Work From Home and Mobile Banking Operations: Evidence From Islamic Banking Sector During Covid-19 in Sri Lanka. *International Journal of Business, Technology and Organizational Behavior (IJBTOB)* 1: 433–46. *Journal of Risk Financial Management*. 16, 230 20 of 20.
- Ibekwe, A. O. (2021). Financial innovation and performance of deposit money banks in Nigeria. *International Journal of Business and Law Research*.9 (1) 162-173.
- Jokela, P., Omar, M. A., and Inaba, K. (2004). Does Financial Inclusion reduce Poverty and Income Inequality in Developing Countries? A panel data analysis, *Journal of Economic Structures*, vol. 9, pp. 1-25.
- Juengerkes, B. (2016). FinTechs and Banks—Collaboration is key. In *The FinTech Book*. pp. 179–82.
- Knight, E., and Wójcik, D. (2020). FinTech, Economy and Space: Introduction to The Special Issue. *Environment and Planning A: Economy and Space* 52: 1490–97.
- Kshitika, R. D., Meena, V., Vinutha, V. and Kavitha, J. (2019). Fintech Innovations and Its Impact on the Profitability of Selected Banks. *International Journal of Business and Management Invention*, 8(1), 41-45.
- Li, Y., Spigt, R. and Swinkels, L. (2017). The Impact of Fintech Start-Ups on Incumbent Retail Banks' Share Price. *Financial Innovations* 3: 1–16.
- Mbiti, I., and Weil, D. N.(2011). Mobile Banking: The Impact of M-Pesa in Kenya, Working Paper No.17129, National Bureau of Economic Research, Cambridge, MA
- Nangin, M., Barus, I. and Wahyoedi, S. (2020). The Effects of Perceived Ease of Use, Security, and Promotion on Trust and Its Implications on Fintech Adoption. *Journal of Consumer Sciences* 5: 124–38.
- Navaretti, G. B., Calzolari, G., Mansilla-Fernandez, J. M., and Pozzolo, A. F. (2017). Fintech and Banks: Friends or Foes? *European Economy – Banks, Regulation, and the Real Sector*,

vol.3, no 2, pp. 9 -30, Available online: [http://european-economy.eu/wp-content/uploads/2017/07/EE\\_2.2017.pdf#page=11](http://european-economy.eu/wp-content/uploads/2017/07/EE_2.2017.pdf#page=11).

- Naz, F., Karim, S. Houcine, A. and Naeem, M. (2022). Fintech growth during COVID-19 in MENA region: Current challenges and future prospects. *Electronic Commerce Research*, 1–22.
- Nguyen, Q.K. (2022). The impact of risk governance structure on bank risk management effectiveness: Evidence from ASEAN countries. *Heliyon* 8: e11192.
- Nicoletti, B. (2017). *The Future of FinTech: Integrating Finance and Technology in Financial Services*. Cham: Palgrave Macmillan.
- Nielsen, N. (1993). Can electronic transfers help the poor? Evidence from a field experiment. *Working Paper*, 1–68.
- Ogbeide-Osaretin, N. E. and Ishiwu, V. N. (2015). An Empirical Investigation into the Impact of Electronic Banking on Nigerian Economic Growth. *The journal of Economics and Social Studies*, 8(1), 108-121.
- Okoye, L.U., Adetiloye, K.A., Erin, O. and Evbuomwan, G. O. (2016). Impact of Banking Consolidation on the Performance of the Banking Sector in Nigeria. *Proceedings of the 28th International Business Information Management (IBIMA) Conference*, Seville-Spain, November 9-10: 4395-4407.
- Olaegbe, A.O. (2011).” The Acceptance of e-banking by customers in Nigeria”. *World Review of Business Research*, 2(2), 6-8
- Omose, V.K., (2011): Exploring merchant adoption of mobile payment systems: An empirical Study. *E-Service Journal*, 6 (2), 24-57.
- Panjwani, K., and Nedra, S. (2020). The Impact of Fintech on Development of Islamic Banking Sector in The Contemporary World. *Saudi Journal of Economics and Finance* 4: 346–50.
- Petralia, K., Philippon, T. Rice, T. and Veron, N. (2019). Banking Disrupted? Financial Intermediation in an Era of Transformational Technology. Technical Report 22, Geneva Reports on the World Economy, ICMB and CEPR.
- Romanova, I., and Kudinska, M. (2016). Banking and Fintech: A Challenge or Opportunity? *Contemporary Issues in Public Sector Accounting and Auditing* 98: 21–35.
- Sarma, M. (2016). Measuring financial inclusion using multidimensional data, *World Economics*, vol. 17, no .1, pp. 15-40.

- Schueffel, P. (2016). Taming The Beast: A Scientific Definition of Fintech. *Journal of Innovation Management* 4: 32–54.
- Senach, B. (1990). *Evaluation ergonomique des interfaces homme-machine: une revue de la littérature*. Rapport de recherche, RR-1180, INRIA.
- Yao, T., and Song, L. (2021). Fintech and The Economic Capital of Chinese Commercial Bank's Risk: Based on Theory and Evidence. *International Journal of Finance and Economics*, 1–15.
- Yudaruddin, R. (2022). Financial Technology and Performance in Islamic and Conventional Banks. *Journal of Islamic Accounting and Business Research* 1: 1–18.
- Zaghol, A., Ramdhan, N. and Othman, N. (2021). The Nexus between FinTech Adoption and Financial Development in Malaysia: An Overview. *Global Business and Management Research: An International Journal* 13: 365–75.
- Zhao, J., Li, X., Yu, C. H., Chen, S., and Lee, C. C. (2022). Riding the FinTech innovation wave: FinTech, patents and bank performance. *Journal of International Money and Finance*, 122, 102552.

**APPENDIX 1 (DATA SET)**

YEARS	ATM1	POS1	INTERNET1	LOGATM	LOGPOS	LOGINTERNET	LR
2010	60,133,610	1,072,426	1,156,533	7.779117	6.030367	6.063158	27.39
2011	347,569,999	2,100,673	3,649,374	8.541042	6.322358	6.562218	42.02
2012	375,487,756	2,555,045	2,297,688	8.574596	6.407399	6.361291	49.72
2013	295,292,940	9,402,255	15,812,435	8.470253	6.973232	7.198999	46.23
2014	400,102,507	20,817,423	29,156,406	8.602171	7.318427	7.464734	38.27
2015	433,587,623	33,720,933	43,933,362	8.637077	7.5279	7.642794	42.35
2016	590,238,934	63,715,203	47,053,252	8.771028	7.804243	7.67259	45.95
2017	800,549,099	146,267,156	47,804,561	8.903388	8.165147	7.679469	54.79
2018	875,519,307	295,890,167	94,653,446	8.942266	8.471131	7.976136	65.04
2019	839,819,922	438,614,182	377,265,208	8.924186	8.642083	8.576647	104.6
2020	1,452,650,218	574,268,788	393,614,158	9.162161	8.759115	8.595071	67.6
2021	1,599,187,337	2,743,555,841	10,321,579,925	9.203899	9.438314	10.01375	85.01
2022	1,506,991,903	3,885,782,065	14,063,927,436	9.178111	9.589478	10.14811	69.06

**APPENDIX 2: DESCRIPTIVE STATISTICS**

	ATM	POS	INTERNET	LR
Mean	8.745330	7.803784	7.842689	56.77154
Median	8.771028	7.804243	7.672590	49.72000
Maximum	9.203899	9.589478	10.14811	104.6000
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Std. Dev.	0.385149	1.167003	1.251819	21.08446
Skewness	-1.022176	-0.021461	0.529984	0.878307
Kurtosis	4.074193	1.844464	2.529474	3.148121
Jarque-Bera Probability	2.888851	0.724266	0.728503	1.683299
	0.235882	0.696190	0.694716	0.430999
Sum	113.6893	101.4492	101.9550	738.0300
Sum Sq. Dev.	1.780060	16.34275	18.80461	5334.653
Observations	13	13	13	13

## REGRESSION ANALYSIS

Dependent Variable: LR

Method: Least Squares

Date: 08/08/23 Time: 12:32

Sample: 2010 2022

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-130.6758	169.9246	-0.769022	0.4616
ATM	12.10826	26.07352	0.464389	0.6534
POS	11.58088	17.35442	0.667316	0.5213
INTERNET	-1.124368	13.56059	-0.082914	0.9357
R-squared	0.611028	Mean dependent var	56.77154	
Adjusted R-squared	0.481371	S.D. dependent var	21.08446	
S.E. of regression	15.18416	Akaike info criterion	8.526042	
Sum squared resid	2075.029	Schwarz criterion	8.699873	
Log likelihood	-51.41928	Hannan-Quinn criter.	8.490312	
F-statistic	4.712645	Durbin-Watson stat	1.892068	
Prob(F-statistic)	0.030467			