



## Financial technologies' evolution and traditional banking: A study of retail payments in Nigeria

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### Abstract

The world of digitalisation is impacting on all aspects of socioeconomic life. This notable change also applies to the financial sector of the global economy. The activities and services of financial technology (FINTECH) overlap with that of traditional banking services. The study seeks to investigate the impact of FINTECH evolution on traditional banking institutions to picture the future of payment systems in Nigeria. Two methods of data analysis were used in the study. An econometric method of data analysis was used to conceptualise the findings of the study. Results from the test of hypotheses reveal that FINTECH affects traditional banking. In conclusion, the present FINTECHs in the Nigerian financial system seem to be slow but are positioned to provide better financial services, especially in payment systems than the traditional banking. The study recommends that the regulators of the Nigeria financial system should incorporate policies into the retail payment system that would ensure full application.

**Keywords:** Financial technologies, generalised linear method, system theory, traditional banking, retail payments;

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## 1. Introduction

A major issue for discussion by professionals and researchers during the COVID-19 pandemic period in Nigeria has been the use of financial technologies (FINTECHs) for banks and other financial institutions in executing financial transactions in the period of global economy lockdown. However, there is a general consensus on the significant impact of FINTECHs evolution on the financial system in Nigeria and the world in general. These financial technologies that have impacted greatly on financial activities have faced a lot of difficulties in their first level of innovations. Therefore, a successful implementation requires a continuous improvement. The Chartered Institute of Bankers in Nigeria (CIBN), in 2019, buttressed this position by stating that several traditional banks have adopted financial technologies to increase banking efficiency. This adoption is due largely to the increasing spread of technology-driven firms in offering financial services which has led to the growing demand on traditional banks to embrace modernisation in their core business activities and services (Hornuf et al., 2020).

Financial Technologies are a contraction of the words 'Financial' and 'technology,' which are broadly used to describe any technological innovation in the delivery of financial services. These services cover a wide range of areas including financial literacy, wealth/asset management, credit markets (P2P lending) retail banking, fundraising, money transfers, investment management services (including trading), digital insurance, payment systems (including cryptocurrencies) and blockchain-assisted contracts playing a significant role (Phillips, 2019; Thakor, 2020). The FINTECH Industry has been utilising technological innovations to provide services offered by the banking and financial services industry (Oney, 2018). Das and Sanjiv (2019) argued that because FINTECH uses technology that is lean and very scalable, they reduce or eliminate the cost of financial intermediation. FINTECHs are taking over industries. Artificial intelligence, mathematical models and supercomputers have replaced human intelligence, human deliberation and human execution. The modern financial industry is becoming faster, larger, more complex, more global, more interconnected and less human (Lin, 2014).

The importance of financial technologies is that banks and other financial institutions as a foundation for the development and sustenance of the financial system, hence, the activities of banks cannot be overlooked. However, the advent of FINTECH is seen to have facilitated a sharp decline in traditional banking activities while fostering the development of financial digital technologies in diverse economies (Suprun et al., 2020). According to the World Bank, banking activities are one of the potent activities required for international trade and development and thus should be given attention by all stakeholders on its continuous development. In view of this fact, many computer and financial analysts made several sets of algorithms or models to facilitate financial transactions. For instance, in the area of developing financial technologies, most governments or financial institutions or other private bodies have made several initiatives and policies on the development of financial technologies. These include online banking (information technology-driven banking), international trade payment (technological-driven trading system), foreign exchange market trading, equity and capital market trading among others. Despite all the initiatives, financial technologies available in the banking sector are yet to be optimised.

With the recognition of the importance of financial technologies in the banking sector, most financial institutions have turned to privately established financial technologies organisations to provide their employees or staff continuous training to further enhance their skill on the jobs as well as increasing

the efficiency of the bank. A mind-blowing question at this juncture of the study is; if financial technologies perform better than traditional pattern of banking, why are the regulators of financial system yet to initiate policies or laws that would compel all traditional banks to embrace digital technologies?

### ***1.1. Types of financial technologies payment adopted in the study***

This study focuses on the payment categories of the following FINTECHs.

Point of sales (POS): This is also known as point of purchase or retail management system. It simply means the place and time in which a retail transaction is completed and executed. This form of payment does away with the need for price tags. With the use of POS, customers are able to make payment with ease and at their convenience.

Automated clearing house (ACH): This deals with any form of paperless medium in making payment. Such paperless medium could be automated direct credits or direct debits. In Nigeria, dividend payments by banks are now paid into investors account through paperless means.

NIBSS Instant Pay (NIP): Instant pay is the ability of financial institutions to disburse loans or payment after documentations or verbal confirmations of transactions. Instant pay is quicker than traditional pay due to the availability of interconnected technologies that fasten the process.

Electric bills payment (EBP): This can be in the form of standing instruction on a bank to execute a particular transaction at a particular time. Technological development in bank facilitates this instruction at 0 min. This instruction is being programmed into the system to execute transaction. It saves the bank the time and cost of revisiting records manually.

The aforementioned FINTECH payments systems are adopted in this study. However, there are many FINTECH payment systems but due to the limitation of sourcing data, the study is restricted these.

### ***1.2. Traditional Banking***

The term 'traditional banking' could be described as a 'financial institution that is dedicated to the administration of the money that its clients deposit in custody and, on the other hand, the bank uses that money to grant it as a loan to individuals or companies, charging them interest. ' Administration of money can pose some issues.

### ***1.3. Proxy for traditional banking used in this study***

Cheque: Cheque has been noted as traditional banking style where three parties are involved. The official procedure or bureaucracy of the use of cheque in Nigeria has often created a lacuna for frauds in the banking sector. Since cheque is a paper-based transaction, it is, therefore, regarded as a proxy for traditional means of payments in this study.

In spite of the importance of financial technologies in any economy, the empirical relationships between FINTECH payment system and traditional banking have not been investigated on the Nigeria. It is on the basis of this, that this study is being carried out. To achieve the objective of this study, the following hypotheses were formulated and subjected to empirical test; POS has no effect on

traditional banking; ACH has no effect on traditional banking; NIP has no effect on traditional banking and EBP has no effect on traditional banking.

## **2. Empirical Literature**

Several studies have been undertaken and the notion shows that financial technologies are great substitute for traditional banking. The outcoming of financial technology has been noted as a big rival for the traditional banking system in Nigeria. However, this review of literature is integrated with the system and resource-based theory.

From the papers of Estrin and Khavul (2016), it is opined that investor finance takes place online (digital technology) while the work of Buchak et al. (2017) postulated that financial institutions with high FINTECH lend with an interest rate lower than traditional banks. Furthermore, Tang (2019) shows that FINTECHs P2P lending is a substitute for traditional bank lending in the US because it serves inframarginal bank borrowers and a complement for small loans.

Furthermore, Dorfleitner et al. (2017) segmented firms in the FINTECH industry into four major groups in line with their unique business models. By analogy, FINTECHs can be distinguished from traditional banking on the basis of online payments system. Furthermore, the research findings of IOSCO (2017) stated that the emergence of online alternative financing platforms either through electronic bill payment (EBP) and NIP payment transfer are considered as one of the more notable developments in recent years, it aimed at bringing together firms and individuals looking for capital and others that have money to lend. Furthermore, the reports of Financial Stability Board, 2017; IOSCO, 2017; Peters and Panayi, 2016, postulated that financial technology has brought about cost advantage, better and more tailored banking system.

Moreover, Chen et al. (2016) stated that the feature of mobile internet finance has a vibrant route transiting from traditional banking services from organisation innovation perspective (Chen et al., 2017). They further explain that innovation exists where there is an integration of mobile internet platforms and financial instruments. However, the fusing of internet-based financial transactions thinking with financial activities makes the financial system complex and competitive for the players.

In addition, Accenture (2014) opined those financial institutions focusing on the future believe that the banks of the future should be 'everyday banks.' Everyday bank implies that banking is driven by financial technologies. The work of Momparler et al. (2013) statistically analysed American internet finance firms with special attention to service efficiency of traditional commercial banks and other related issues. They concluded that internet finance is more favourable to traditional finance as internet finance is highly efficient, minimum cost of operation and convenience. Williams et al. (2017) opined that those financial technologies had helped financial inclusions and financial services in getting to the rural areas. While, Wei et al. (2017) stated that the use of big data and its application by financial institutions creates a profound impact on the structure of financial institutions. They further opined that traditional banking should embrace the use of big data as this would give them an opportunity to gain insight into the future of the financial system. Chen et al. (2016) showed clearly that provided the optimal timing and equilibrium for retail payments. They explained that instant transfer, EBP and internet banking system facilitate business activities and ease the process of business mergers and acquisitions.

From the foregoing, Moored (2018) states that the biggest challenge facing traditional banking is how the banks may stay engaged with the customers. Meanwhile, academic scholars and professionals are of the opinion that capital or liquidity is the biggest challenge of business continuity. Kara (2015) suggests that the application of Basel principles is an indicator that the most financial institutions are adopting FINTECH for both business and regulating activities while the Bank for International Settlements (BIS) in the year 2015 shows that a good proportion of financial institutions have implemented the Basel principles and committee on banking supervision (BCBS). Furthermore, the work of Cline (2016) states that increase in bank capital base from time to time reduces the likelihood of bank crises and the use of financial technologies. Kara (2016), furthermore, states that financial technologies and experience by financial institutions trigger a force for stringent capital regulations and technological innovations.

Furthermore, Lines (2016) shows that FINTECH create an avenue to 'pump' new blood into the traditional banking system as a complement to the retail banking services. This can be done through effective and efficient FINTECHs such as instant payment. Juengerkes (2016) uses POS as one of the variables proxies for financial technologies to find the impact on traditional banking. The results show that POS has a positive impact on traditional banking and that POS payment system gain accesses to new capitals and crave for more robust technology to further execute financial transactions.

A linear model was formulated by Li et al. (2017) to find the relationship between FINTECH funding and incumbent retail bank stock returns where FINTECH includes EBP, NIBSS Electronic Fund Transfer and NIP. Lagarde (2018) states that the use of financial technologies for equity market had also been applied in commodity market. The use of blockchain technology for cryptocurrency assets provides minimum cost payment methods. Mourdoukoutas (2017) suggests that Bitcoin is under attack by some financial institutions operating on the equity market. However, Mourdoukoutas (2017) further explains that most traditional banks see the full applications of Bitcoin as threat to their operation, while, Hornuf and Schwienbacher (2017) indicated that equity trading was facilitated by instant payments transaction, electric bill payments, POS payment and other forms of financial technologies payment platform. It seems that retail payments through financial technologies platform are a critical indicator of future banking activities. Omar et al. (2016) stated that the use of paper-based pattern of financial transactions is noted as traditional pattern. They further investigate the use of cheques as proxy for traditional banking and they found out the more the increase of financial technologies the lesser the use of traditional banking pattern like issuing of cheques. It is from the foregoing that this study investigated the relationship between FINTECHs development and traditional banking system with a focus on the payment systems in Nigeria.

### **3. Methods and Materials**

The researchers used various types of econometric techniques in finding the impact of FINTECH on traditional banking in the Nigeria banking sector. The data used in the study are secondary in nature and were sourced from CBN statistically bulletin. Due to the paucity of data of FINTECH in Nigeria, the researchers adopted data available from 2010 to 2019 on monthly basis. Furthermore, linear econometric techniques such as generalised linear model (GLS), autoregressive distributive lag (ARDL), unit root test, augmented Dickey fuller test and the stability test were used as methods of data analysis in the study.

To investigate impact of financial technologies on traditional banking in Nigeria, the model for the study is specified as follows:

$$TB = f(\text{PoS}, \text{ACH}, \text{NIP}, \text{EBP}) \quad \text{Eq.1}$$

$$TB = \beta_0 + \beta_1 \text{PoS} + \beta_2 \text{ACH} + \beta_3 \text{NIP} + \beta_4 \text{EBP} + \epsilon \quad \text{Eq.2}$$

The Model is further written in log linear form:

$$\text{LOGTB} = \beta_0 + \beta_1 \text{LOGPoS} + \beta_2 \text{LOGACH} + \beta_3 \text{LOGNIP} + \beta_4 \text{LOGEBP} + \epsilon \quad \text{Eq.3}$$

Where:

TB = Traditional banking (proxy with cheque clearing)

**Financial Technology proxies with:**

PoS = Point of Sales

ACH = Automated Clearing House (ACH)

NIP = NIBSS Instant Pay

EBP = Electric Bills Payment

€ = error term

## 4. Results and Discussion

### 4.1. Results on test for reliability

**Table 1.** Cronbach's alpha result

Case processing summary			
		n	%
Cases	Valid	36	100.0
	Excluded	0	.0
	Total	36	100.0
a. Listwise deletion based on all variables in the procedure.			
Reliability statistics			
Cronbach's alpha	Cronbach's alpha based on standardised items	No. of items	
0.820	0.825	5	

**Source: Researcher's computation using SPSS**

From the test of reliability of the data using Cronbach's alpha value of 0.820 indicate that 82% of the data scales are reliable.

**4.2. Results from the GLS**

**Table 2.** Generalised linear model result

Dependent variable: TB				
Method: Generalised linear model (quadratic hill climbing)				
Dispersion computed using Pearson Chi-square				
Coefficient covariance computed using observed Hessian				
Convergence achieved after 1 iteration				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	11,652,319	2,999,849	3.884302	0.0004
POS	2.341176	1.689479	1.385738	0.0000
NIP	-483072.2	117380.0	-4.115458	0.0002
EBP	-350444.0	376183.7	-0.931577	0.0000
ACH	2.256917	1.687864	1.337144	0.0000
Mean dependent var	12,543,218	S.D. dependent var		7,215,763.
Sum squared resid.	1.820015	Log likelihood		-619.1076
Akaike info criterion	34.50598	Schwarz criterion		34.59395
Hannan-Quinn criter.	34.53668	Deviance		1.820015
Deviance statistic	5.360013	Restr. Deviance		1.820015
LR statistic	3.540005	Prob. (LR statistic)		0.995254
Pearson SSR	1.820015	Pearson statistic		5.360013
Dispersion	5.360013			

**Source: EViews output, 2020**

The TB represents the dependent variable and the independent variables are ACH, POS, NIP and EBP. The regression result shows the relationship between financial technologies and traditional banking. The impact of ACH on TB is positive of 2.256917. Hence, we can deduce that there is a positive relationship between POS and TB of 2.3411. This outcome corroborates the assumption that increase in financial technologies lessens the traditional banking system. Furthermore, the EBP shows a negative relationship with TB of -35044. This means that 1% increase in EBP will lead to a corresponding fall in TB. The EBP, therefore, plays a significant impact on traditional banking system based on the assumption that financial technologies are emerging technologies to replace traditional banking. The regression result table above shows that there is a negative impact of NIP on TB of -4830. This implies that a unit increase in NIP will lead to a corresponding fall of -4830 in TB. This result shows that as customers in Nigeria use NIP as means of payment transactions, the traditional banking system of payment negatively will be affected negatively with less patronage.



The Bayesian information criterion which is represented by the Schwarz criterion of 34.59 and the Prob. (LR statistic) of 0.995 shows that the model is a good fit and that the joint variations of the model are significant.

### 4.3. Unit root test

**Table 3.** Unit root test and the augmented Dickey-Fuller test statistic

Variables	ADF	Probability	Critical values	Order of integration
LTB	-3.18046	0.0295	-2.94584**	I(1)
LPOS	-9.77423	0	-2.94584**	I(1)
LNIP	-4.14349	0.0026	-2.94584	I(1)
LEBP	-5.64306	0	-2.94584**	I(1)
LACH	-3.9623	0.0193	-3.54033	I(0)

\*\*\*Significant at 1%, \*\*significant at 5% and \*significant at 10%.

Table 3 shows that the variables are stationary at 1% level of significance, 5% and 10% level of significance, respectively. Furthermore, we can deduce that there is statistical evidence to prove that we can reject null hypotheses and accept alternative hypotheses that individual series are stationary at their first differences. TB, POS, NIP and EBP are stationary at their differences indicating the presence of unit roots while ACH was stationary at first differences. This means that the integration of the variables at the same order suggests that cointegration exists.

### Heteroskedasticity test

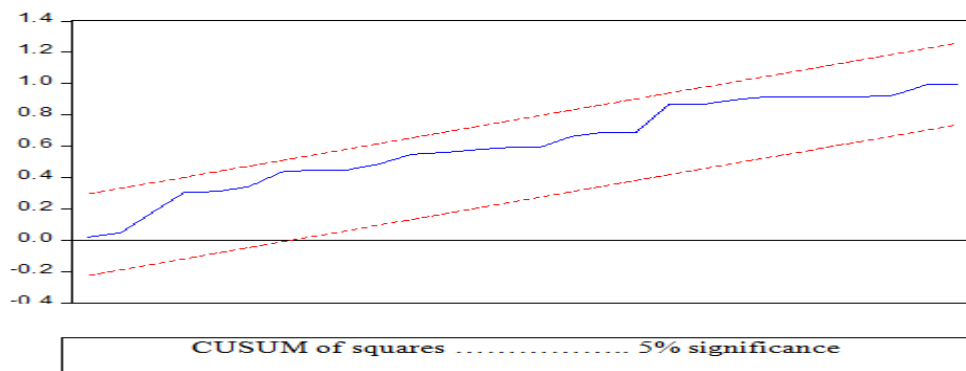
**Table 4.** Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	1.975968	Prob. F (8,28)	0.0874
Obs*R-squared	13.35121	Prob. Chi-Square (8)	0.1003
Scaled explained SS	6.530082	Prob. Chi-Square (8)	0.5881

From the result, we can deduce that the Pro. (F-statistics is 0.0874) and the Prob. (Chi-square is 0.1003) indicate that both are not equal to 0, therefore, the null hypothesis should, therefore, be accepted (=no heteroskedasticity exists).



### Stability test



**Figure 1.** Stability test for the study model

From the above graph, we deduce that the graph that moves in a random shape which falls between the dotted straight lines graph. Having noted that, we, therefore, concluded that stability had been established among the variables' proxies for financial technologies.

### Hypotheses test

In line with the research questions, the t-statistic value from the ARDL cointegration technique result was used to answer the research questions.

### The ARDL result

$$\text{LOGTB} = \beta_0 + \beta_1 \text{LOGPoS} + \beta_2 \text{LOGACH} + \beta_3 \text{LOGNIP} + \beta_4 \text{LOGERBP} + \epsilon \quad \text{Eq3}$$

**Table 5.** ARDL result

Dependent Variable: LTB				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LTB(-1)	1.164796	0.127684	9.122488	0
LPOS	0.031894	0.020674	1.542685	0.1341
EBS	-2.19776	0.942009	-2.33305	0.0271
EBS(-1)	2.953956	1.044644	2.827716	0.0086
LNIP	0.077759	0.109217	0.711966	0.4824
LNIP(-1)	-0.22892	0.097125	-2.35693	0.0257
ACH	0.323546	0.085079	3.802899	0.0007
C	-1.44499	0.641825	-2.25137	0.0324
R-squared	0.999474	Mean dependent var	29.35385	
Adjusted R-squared	0.999324	S.D. dependent var	2.291061	

S.E. of regression	0.059567	Akaike info criterion	-2.59566
Sum squared resid.	0.09935	Schwarz criterion	-2.20382
Log likelihood	57.0197	Hannan-Quinn criter.	-2.45752
F-statistic	6653.456	Durbin-Watson stat	1.992091
Prob. (F-statistic)	0		

**Source: EViews, output 2020.**

### Hypothesis 1

**H<sub>0</sub>:** PoS has no impact on traditional banking payments.

Variable	t-Statistic
POS	1.542685

**Source: Extracted from ARDL result.**

1.542685 > 0.05, we accept the alternative hypothesis (H<sub>1</sub>) and conclude that POS a proxy for financial technologies affects traditional banking in Nigeria.

### Hypothesis 2

**H<sub>0</sub>:** ACH has no impact on traditional banking payments.

Variable	t-Statistic
ACH	3.802899

**Source: Extracted from ARDL.**

3.802899 > 0.05, we accept the alternative hypothesis (H<sub>1</sub>) and conclude that ACH affects traditional banking (TB).

### Hypothesis 3

**H<sub>0</sub>:** NIP has no impact on traditional banking payments.

Variable	t-Statistic
NIP	0.711966

**Source: Extracted from ARDL result.**

$0.711966 > 0.05$ , we accept the alternative hypothesis ( $H_1$ ) and conclude that NIP affects traditional banking.

#### Hypothesis 4

$H_0$ : EBP has no impact on traditional banking payments.

Variable	t-Statistic
LOGEBP	2.827716

Source: Extracted from ARDL.

$2.827716 > 0.05$ , we accept the alternative hypothesis ( $H_1$ ) and conclude that e-bills payment (EBP) affects traditional banking payments.

#### Discussion of result

Existing literatures (Adeyoju, 2020; Anichebe, 2019; Effiom and Edet, 2020; Wayne et al., 2020; Ozili, 2020; Ojo and Nwaokike, 2018; Suprun et al., 2020; Chun et al., 2017) have confirmed that in spite of financial technologies been emerging innovation in the financial system in Nigeria and the world in general, 80% of the Nigeria financial institutions are drifting from traditional banking to FINTECH. However, the most financial institutions in Nigeria still rely on traditional banking as alternative pending the climax of human capital development in Nigeria. Furthermore, the work of Dorfleitner et al. (2017), Pierrakis and Collins (2013), Uche (1999), Thakor (2020), Hornuf et al. (2020), Cumming and Schwiendbacher (2018) and the work of Ahmed and Monir (2018) concluded that financial technologies are a fast innovation to substitute the traditional banking. In view of this fact supported by the empirical literatures that financial technologies would wipe out traditional banking in the long run, this study has shown that a 100% application of FINTECH in the Nigeria financial system would re-energise the Nigeria banking system to equate international banking system. Based on the foregoing discussion, the researchers infer those modern financial technologies are already kept in place by financial institutions and the regulators of the financial system in Nigeria.

#### 5. Conclusion and Policy Recommendation

It is pertinent to state that financial technologies increase efficiency and reduce cost and time of business transactions in the Nigerian business environment going by the findings in this study. On the whole, our findings indicate a clarion call to all financial institutions in Nigeria that there is a need to restructure the traditional method of banking and overhaul all existing pattern of payment in the traditional way so that the financial system would be transparent in financial transactions.

From the ARDL result of this study, it can be concluded that financial technologies affect traditional banking services in Nigeria. Hence, to promote strong financial technologies in the Nigeria deposit

money banks, some variables such as cost advantage, financial inclusions and regulation technologies are to be put in place so that the positive impact of financial technologies in the Nigeria financial system could be felt. When financial technologies innovation activities increase, traditional banking declines and the financial system become stable and competitive. A significant proportion of financial innovation into the financial system boost major banking activities. Empirical studies have shown that financial technologies have positive impact on economic growth and development as its aid efficiency and increase growth. Hence, this study concludes that financial technologies are significant variables that propel and checkmates the financial system to work optimally and thus remove any form of inefficiency in the financial system. We, therefore, recommend that the regulators of the Nigeria financial system should incorporate policies into the retail payment system that would ensure full application, compliance and cooperation of FINTECH and traditional banking system for the restructuring of the Nigerian financial industry to become digital at the core.

## References

- Accenture. (2014). *The Everyday Bank: A New Vision for the Digital Age*. Report.
- Adeyoju, A. (2020). *Financial Technology and Privacy: Evaluating the Approach to Consumer Data*. Saskatoon, Canada: University of Saskatchewan.
- Ahmed, T., & Monir, A. (2018). *Financial Technology in Banking Industry: Challenges and Opportunities*. Paper Presented at the International Conference on Economics and Administrative Sciences ICEAS.
- Anichebe, U. (2019). *How Regulations can Define the Future of Fintech in Nigeria*.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99–120.
- BCBS. (2017). *Sound Practices: Implications of Fintech Developments for Banks and Bank Supervisors, Basel-Switzerland*. Retrieved from <https://www.bis.org/bcbs/publ/d415.htm>
- Bryman, A., & Bell, E. (2003). *Business Research Methods*. Oxford: Oxford University Press.
- Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2017). Fintech, regulatory arbitrage, and the rise of shadow banks. *Journal of Financial Economics*, 130(3), 453–483.
- Central Bank of Nigeria. (2019). *Financial Regulations and Monetary Policy Brief*. Abuja, FCT, Nigeria: Central Bank of Nigeria.
- Chen, Z., Li, Y., Wu, Y., & Luo, J. (2017). The transition from traditional banking to mobile internet finance: An organizational innovation perspective-a comparative study of Citibank and ICBC. *Financial Innovation*, 3(1), 1–16.
- Chen, Z., Zhu, H., & Guo, Q. (2016) *Research on Mobile Internet Banking Organizational Innovation (Chinese)*. Outstanding Paper of the 14<sup>th</sup> International Academic Conference on Financial Systems Engineering and Risk Management (FSERM'2016) 8, Harbin.
- Cumming, D. J., & Schwienbacher, A. (2018). Fintech venture capital. *Corporate Governance: An International*

Iriobe, G., Tega, W.H., Ayodele, T. & Taofeek, A. (2021). Financial technologies' evolution and traditional banking: A study of retail payments in Nigeria. *Global Journal of Business, Economics and Management: Current Issues*, 11(2), 163-177.

<https://doi.org/10.18844/gjbem.v11i3.5369>

*Review*, 26(5), 374–389.

Dorfleitner, G., Hornuf, L., Schmitt, M., & Weber, M. (2017). *Definition of FinTech and Description of the FinTech Industry FinTech in Germany* (pp. 5-10). Berlin: Springer.

Effiom, L., & Edet, S. E. (2020). Financial innovation and the performance of small and medium scale enterprises in Nigeria. *Journal of Small Business and Entrepreneurship*, ???, 1–34.

Estrin, S., & Khavul, S. (2016). *Equity Crowdfunding and the Socialization of Entrepreneurial Finance*. Paper Presented at the Academy of Management Proceedings.

Financial Stability Board, F. (2017). *Financial Stability Implications from FinTech: Supervisory and Regulatory Issues that Merit Authorities' Attention*. Retrieved from <http://www.fsb.org/wpcontent/uploads/R270617.pdf>

Hannan, T. H., & McDowell, J. M. (1984). The determinants of technology adoption: The case of the banking firm. *The RAND Journal of Economics*, 15(3), 328–335.

Hornuf, L., & Schwienbacher, A. (2017). Should securities regulation promote equity crowdfunding? *Small Business Economics*, 49(3), 579–593.

Hornuf, L., Klus, M. F., Lohwasser, T. S., & Schwienbacher, A. (2020). How do banks interact with fintech start-ups? *Small Business Economics*, ???, 1-22.

Hu, T., & Yang, J. (2014). Cross border Mergers and Acquisitions and Transformation of Commercial Banks. *Wuhan Finance (Chinese)*, ???(5), 57–59.

IOSCO. (2017). *Research Report on Financial Technologies (Fintech)*. Retrieved from <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf>

Juengerkes, B. E. (2016). *FinTechs and Banks-Collaboration is Key. The FinTech Book: The Financial Technology Handbook for Investors, Entrepreneurs and Visionaries*, (pp. 179–182). Hoboken, New Jersey: Wiley.

Lagarde, C. (2018). *Addressing the Dark Side of the Crypto World*. Retrieved from <https://blogs>

Lee, L. (2014) Herding behaviour in online P2P lending: An empirical investigation. *Electronic Commerce Research and Applications*, 11(5), 495–503.

Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of FinTech start-ups on incumbent retail banks' share prices. *Financial Innovation*, 3(1), 26.

Lines, B. (2016). *How FinTech is Shaping Financial Services: PwC Global Fin-Tech Report*.

Moeninghoff, S. C., & Wieandt, A. (2013). The future of peer-to-peer finance. *Schmalenbachs Journal*, 65(5), 466–487.

Momparler, A., Lassala, C., & Ribeiro, D. (2013). Efficiency in banking services: A comparative analysis of Internet-primary and branching in the US. *Service Business*, 7, 641–663.

Iriobe, G., Tega, W.H., Ayodele, T. & Taofeek, A. (2021). Financial technologies' evolution and traditional banking: A study of retail payments in Nigeria. *Global Journal of Business, Economics and Management: Current Issues*, 11(2), 163-177.

<https://doi.org/10.18844/gjbem.v11i3.5369>

Mourdoukoutas, P. (2017). *Why Big Banks Attacked Bitcoin*.

Ojo, O., & Nwaokike, U. (2018). Disruptive technology and the fintech industry in Nigeria: Imperatives for legal and policy responses. *Gravitas Review of Business and Property Law*, 9(3), ???.

Owojori, A. A., & Asaolu, T. O. (2010). Critical evaluation of personnel management problems in the Nigerian school system. *International Journal of Education Science*, 2(1), 1–11.

Ozili, P. K. (2020). Financial inclusion in Nigeria: Determinants, challenges and achievements. In *New Challenges for Future Sustainability and Wellbeing (Emerald Studies in Finance, Insurance, and Risk Management)*. Bingley: Emerald Publishing Limited,

Peters, G. W., & Panayi, E. (2016). *Understanding Modern Banking Ledgers through Blockchain Technologies: Future of Transaction Processing and Smart Contracts on the Internet of Money Banking beyond Banks and Money* (pp. 239-278). Berlin: Springer.

Philippon, T. (2015). Has the US finance industry become less efficient? On the theory and measurement of financial intermediation. *The American Economic Review*, 105(4), 1408–1438.

Pierrakis, Y., & Collins, L. (2013). Banking on each other: Peer-to-peer lending to business: Evidence from funding circle.

Sanjiv, R. D. (2019). The future of fintech. *Journal of Financial Management, Financial Management*, 48, 981–1007.

Schweizer, K., Lam, E., & Zuki, T. (2017). *What the World's Central Banks are saying about Bitcoin*. Retrieved from <https://www.bloomberg.com/news/articles/2017-12-15/what-the-world-s-central-banks-are-saying-about-cryptocurrencies>

Skar, J., Dickerson, J., & Masood, S. (2015). *The Future of Fintech and Banking: Digitally Disrupted or Reimagined*. London: Accenture.

Suprun, A., Petrishina, T., & Vasylichuk, I. (2020). Competition and cooperation between fintech companies and traditional financial institutions. In *E3S Web of Conferences* (Vol. 166, p. 13028). EDP Sciences.

Tang, H. (2019). Peer-to-peer lenders versus banks: Substitutes or complements? *The Review of Financial Studies*, 32(5), 1900–1938.

Thakor, A. V. (2020). Fintech and banking: What do we know? *Journal of Financial Intermediation*, 41, 100833.

Uche, J (1999). Explaining interfirm cooperation and performance: Toward a reconciliation of predictions from the resource-based view and organizational economics. *Strategic Management Journal*, 20, 9, 867–888.

Walonic, G.B. (2009). Advancing egalitarianism. In L. K. D. Chuen (Ed.), *Handbook of Digital Currency: Bitcoin, Innovation, Financial Instruments, and Big Data* (pp. 385–401). London: Elsevier.

Wayne, T., Soetan, T., Bajepade, G., & Mogaji, E., (Eds.), (2020). *Technologies for financial inclusion in Nigeria* (pp. 40–56). Technologies for Financial Inclusion in Nigeria Research Agenda Working Papers.

Iriobe, G., Tega, W.H., Ayodele, T. & Taofeek, A. (2021). Financial technologies' evolution and traditional banking: A study of retail payments in Nigeria. *Global Journal of Business, Economics and Management: Current Issues*. 11(2), 163-177.

<https://doi.org/10.18844/gjbem.v11i3.5369>

Wei, Y., Huang, X., & Zhang, W. (2017) Digital transformation of commercial banks in big data era. *The Chinese Banker (Chinese)*, 2, 128–131.

Williams, H. T., Adetoso, J. A., & Adegbola, D. (2017). Role of financial inclusion in economic growth and poverty reduction in a developing economic. *Internal Journal of Research in Economics and Social Sciences*, 7(5), 265–271.

Yamane, T. (1967). *Statistics, an Introductory Analysis*, (2<sup>nd</sup> ed.). New York: Harper and Row.