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FINTECH EVOLUTION AND DEVELOPMENT IN NIGERIA: LESSONS FROM OTHER JURISDICTIONS



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EXECUTIVE SUMMARY

The aftermath of the 2007/2008 global financial crisis brought about the need to revamp and restore the already eroding confidence in financial institutions. Financial technology (Fintech) leveraged the crisis and the massive advancement in technology at that time, to emerge in all corners of the globe. Fintech in Nigeria has grown remarkably over the years, with investments in the Fintech industry recording more than US\$200.00 million between 2011 and 2018.

Despite the positive developments, sentiments concerning Fintech in Nigeria remain mixed, as adoption still remains low. Furthermore, their disruptive business models and operations are still novel and thus, make them seem to be a threat, replacement or in competition with the dominant traditional players in the financial services sector.

This paper is relevant, given the increasing interest of policy makers in Fintech and Fintech companies, as reflected in several policies such as the BVN and the Payments System Vision (PSV) 2020, among others, aiming to drive financial inclusion in the country.

This study relied on descriptive analysis of secondary data obtained from the CBN database to examine the evolution of Nigeria's Fintech ecosystem and identify its gains and challenges. Furthermore, the experiences of selected countries were studied to draw lessons and pinpoint policy responses designed to widen the Fintech space in those regions.

The assessment showed that the Payments System Vision (PSV) 2020 launched by the CBN in 2007 laid the foundation for the growth of the Fintech ecosystem in Nigeria. This growth was witnessed in the continuous positive trend in the value and volume of transactions through e-payment channels, including Automated Teller Machine (ATM), Point of Sale (PoS) Machine, Mobile Money Operators (MMOs), Web transactions and NIBSS Instant Payments (NIP) from 2012 to 2018.

Other policies such as the cash-less Policy in 2011, guidelines on operations of electronic payment channels, transactions switching, the regulatory framework for mobile money services and the National Financial Inclusion Strategy (NFIS) in 2012, helped to reshape the operations of financial institutions

and the Fintech industry. Nigerian tech start-ups attracted venture capital investments with a record high of US\$747.00 million in 2019, which accounted for 37.0 per cent of funding in Africa, representing a significant 585.3 per cent increase, when compared with US\$109.00 million (16.9 per cent of Africa's total) in 2016. These findings highlight the success story and extent to which Fintech has grown in Nigeria.

However, the study noted that the growth of Fintech is still hampered by some headwinds, such as limited data access, inadequate cyber security, low market confidence, access to funding and institutional knowledge gap. From the Jurisdictional experiences studied, some vital lessons, which could be beneficial to tackling the challenges encountered by Fintech start-ups in Nigeria were drawn. These include developing capacity to counter cybersecurity risks, improving digital infrastructure, increasing funding, lowering transaction fees, building partnerships and improving skilled manpower.

In conclusion, Fintech start-ups are indeed reshaping the financial services industry Nigeria. One of its major benefits is that it opens up opportunities for financial inclusion as it makes financial services more accessible to Nigerians. It also

provides a wide range of financial solutions for organisations. This study recommends that to solve the challenges faced in the Fintech ecosystem: internal governance frameworks and strategies on cybercrime mitigation need to be tightened; Fintech start-ups and banks should collaborate more and focus on strengthening their digital infrastructure platforms; the Securities and Exchange Commission should simplify the process of listings on the capital market; and there should be collaborations between the CBN and other regulators like the SEC and NCC to provide a unified regulatory system for coordinating the activities of Fintech start-ups.

1.0 INTRODUCTION

The aftermath of the 2007/2008 global financial crisis brought about the need to revamp and restore the already eroding confidence in financial institutions. Prior to the development, these institutions had traditionally been the bedrock of payments, settlements and other financial services. However, at the post-crisis period, there was widespread lack of trust in banks, as personal loans were turned down and businesses had to deal with refusals on lines of credits and mortgages (Gelis & Woods, 2014). Financial technology (Fintech)¹ leveraged on this crisis and the massive advancement in technology at that time, to emerge in all corners of the globe. This paradigm can be seen in the astronomical global investment growth in the Fintech sector from US\$0.93 billion in 2008, to over US\$135.70 billion in 2019 (Pollari & Ruddenklau 2019). In response, other financial institutions began to embrace technology and encouraged a prolific fragmentation of technology services and innovations in a

¹ According to Lagarde (2017), "Fintech are collection of new technologies and innovations whose applications may affect financial services, including artificial intelligence, big data, biometrics, and distributed ledger technologies such as block chains.

bid to improve their services and stay in business (Parameshwar et al., 2019). Koffi (2016) noted that about 60.0 per cent of all global retail banking transactions are now consummated online, making the financial industry one of the worlds most digitised.

Fintech in Nigeria has grown remarkably over the years, particularly after the Payments System was strengthened by the CBN in 2007 through the implementation of the Payments System Vision 2020. The invigorated payments system brought about notable enhancements in the use of Cards, ATM, Point-of-Sales (PoS) Terminals, Electronic Funds Transfers, and Mobile payments. These reforms, coupled with the young and tech savvy population, high mobile phone usage, increasing broadband penetration and a large unbanked population, among others, led to the emergence of several financial technology firms, whose modus operandi centered on these technologies. From 2011 to 2018, investments in the Fintech industry recorded more than US\$200.00 million², showing that Fintech is becoming a major player in Nigeria's financial sector, despite the challenging operating environment of the

² <https://www.pwc.com/ng/en/assets/pdf/fintech-banking-sector-nigeria.pdf>

country. There is no doubt that the Covid-19 pandemic has intensified reliance on digital technology, as Fintech solutions offered accessible, affordable and speedy solutions especially during the imposed lockdown.

Despite these developments, sentiments concerning Fintech in Nigeria remain mixed, as adoption still remains low in a country where the informal sector is still burgeoning and more than half of the population are still unbanked or without financial services. The industry is relatively new when compared to its counterparts globally and the older populace are not as tech savvy as the younger ones and still prefer the brick-and-mortar banking. Furthermore, their disruptive business models and operations are still novel and thus, make them seem to be a threat, replacement or in competition with the dominant traditional players in the financial services sector. This paper is important, given the interest of policy makers in Fintech and Fintech companies, as reflected in several policies such as the BVN and the Payments System Vision (PSV) 2020, among others, aiming to drive financial inclusion in the country.

This study tends to identify the gains and challenges faced by

Fintech companies in Nigeria. The experiences of selected countries were studied to draw lessons and pinpoint policy responses designed to widen the Fintech space in those regions. This would help to provide insights that are useful for decision making and suggest practical recommendations for the development of these frameworks.

The paper is split into six sections. Following the introduction, Section 2 reviews concepts and relevant literature relating to Fintech, while Section 3 discusses the evolution and the developments in Fintech in Nigeria. Section 4 presents experiences of other jurisdictions. Section 5 discusses the challenges of Fintech in Nigeria, while Section 6 concludes the paper and provides recommendations.

2.0 LITERATURE REVIEW

2.1 Fintech: Conceptual Issues

The term "Fintech" refers to financial technology, which is an industry that includes all forms of technology used to deliver financial services to businesses and households.

Some scholars define Fintech as the union of technology and finance (Zavolokina et al., 2016) and a financial technology contraction (Puschmann, 2017). Frame and White (2014) suggested that financial innovation and Fintech are intertwined because, Fintech creates new processes, companies, products, and services. In other terms, it develops and promotes new financial instruments, institutions, markets, and technologies (Lerner & Tufano, 2011). Therefore, Fintech encourages people with chances to reduce intermediaries, minimise costs and increase transparency to access financial services (Zavolokina et al., 2016).

Schindler (2017) and Pullaro (2017) acknowledges as generally, acceptable the definition of the Financial Stability Board (FSB, 2019) which defines Fintech as "technologically enabled innovation in financial services that could result in new business models, applications, processes or products

with an associated material effect on financial markets and institutions and the provision of financial services". According to Schindler, (2017) this is because it believes that the technology that makes possible financial innovation will have an impact on financial institutions and their services. Besides, it is split into two sections, the first is unambiguous (technology innovation in financial services), and the second of which is more theoretical (Schindler, 2017). In that regard, Fintech firms go beyond simply automating the processes and transactions associated with traditional financial services; rather, they represent innovations that lessen the traditional and radical approaches to finance. Cortada (2004) and Pullaro (2017) noted that Fintech firms would change the rules in the market place and financial system due to the innovative nature of their operations and the fact that the market and public embrace their services with ease.

Finally, in line with the transformation of Fintech firms, Puschmann (2017) defines Fintech, as an innovative development in the financial services industry. Additionally, previous studies attempted to define Fintech firms, by providing a framework for the phenomenon, and defining its dimensions (Zavolokina et al., 2016; Frame & White, 2004;

Tufano, 2003), and other studies contributed to the list of factors driving partnerships between banks and Fintech firms (Holotiuk et al., 2018). The framework of the Fintech firms runs in a series of steps, beginning with input and ending with output-producing mechanisms. Firstly, the input stage is made up of technology (the underpinning technology as platforms and applications), organisations (startups and businesses whose operations focus on providing IT financial services), and money flow, or investment that helps to establish these organisations and to support their growth. The second dimension is mechanisms, which includes activities for creating, modifying, and improving the existing services, while utilising the underlying technologies. Lastly is the output dimension, which includes new services, products, and processes.

2.2 The Importance of Fintech

The past few decades have witnessed strong growth and development in technological innovation, especially in Fintech. Brandl and Hornuf, (2017), stated that currently, the traditional players in the financial sector, i.e. the financial institutions, have slowly begun to align with the new

technological innovations to improve financial activities. Although recently, Brandl and Hornuf have shown that most Fintech start-ups are independent and are open to investors, which has led to the acquisitions of Fintech companies by banks, to develop new or improved banking products using internet-based and mobile technology to revive and modernise the financial sector. In addition, Brandl and Hornuf further emphasised that almost all banks, excluding the established big banks, still offer expensive, outdated, and burdensome financial services. Li et al. (2017) suggest that Fintech firms have the chance to replace several important tasks performed by conventional banks, such as 24/7 access, remote account opening, quick consultations, and better communication with customers overall.

The consumer theory by Aaker and Keller (1990), explained how Fintech companies affect banks. According to the theory, new services provided by Fintech companies will replace the old services provided by the conventional banks by meeting the same consumer demand. The remit of this theory is important to the emergence of Fintech companies in the banking sector. With an emphasis on the effect of firm entry, Jun and Yeo (2016) backed this school of thought with

their model of a two-sided market with vertical limitations. The end-to-end and front-end service provider was the main focus of the model, and the supposition was that two-sided markets develop when there are externalities that the platform can help with using technology in order to reduce transaction costs.

One distinguishing feature of Fintech companies is that they are using cutting-edge technology to carry out operations that were formerly the domain of banks and other financial institutions, such as lending, payments, asset management, investments, financial advisory, and insurance, among others (Chishti & Barberis, 2016; Brandl & Hornuf, 2017; Puschmann, 2017). Additionally, Fintech companies have been creating workable solutions to boost efficiency in a variety of financial services, including but not limited to contactless and instant payments, asset management services, investment and financial service advice, and information and data management/storage (Villeroy de Galhau, 2016). Jagtiani and Lemieux (2018) assert that non-bank lenders can obtain soft information about a borrower's creditworthiness by leveraging big data analytics and interlinked data networks across platforms. Both consumers and small businesses,

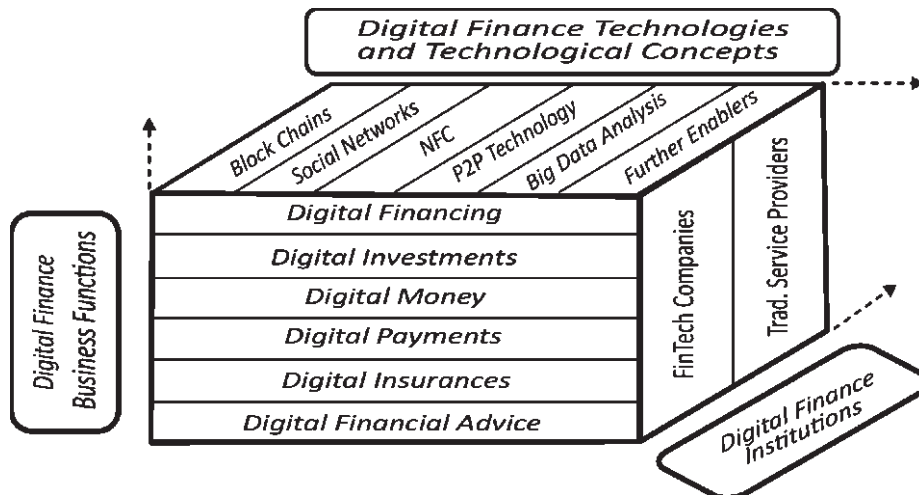
especially those with poor credit histories, are thought to benefit from this service. On the other hand, banks use outdated information technology and are perceived to be hesitant to adapt to new technologies (Hannan & McDowell, 1984; Laven & Bruggink, 2016; Brandl & Hornuf, 2017). The main conclusion is that Fintech can eventually complement traditional banking by encouraging more affordable and effective service delivery.

2.3 Fintech Conceptual Framework

The financial industry is undergoing significant change, which has an impact on traditional financial institutions. In Gomber et al. (2017) Fintech framework “Digital Finance Cube”, the authors identified three dimensions, namely, digital finance technologies and technological concepts; digital finance business functions; and institutions that offer digital finance solutions. Additionally, Gomber et al. (2017) noted that the Cube has two features, namely, an excessive degree of generalisation and flexibility. The authors show that not all the cube spaces are used and that while some institutions may have a specific area within them, some others are widely

dispersed within the cube. Figure 1 provides a sketch of the Fintech framework.

Figure 1: The Three Dimensions of the Digital Financial Cube



Source: Gomber et al. (2017).

The first dimension consists of the digital finance business functions, which include the main financial services, such as financing, investment, money, payment, insurance, and financial advice. Gomber et al. (2017) clearly show that the business functions of Fintech start-ups and financial institutions are the same. The second dimension is “Digital Finance Technology and Technological Concepts”, which is focused on technologies that help the submission of the previous business functions, e.g. social networks, blockchain, P2P

systems, and Big data analytics. The third dimension is “Digital Finance institutions”, which encompasses Fintech start-ups, conventional financial institutions, and the new institutions, which are the IT companies that are moving into the financial services industry. Furthermore, Gomber et al. (2017), stated that conventional institutions are in a better position to adopt the new technologies to be more innovative, while the Fintech start-ups encounter challenges to meet regulatory standards and criteria.

2.4 Disruptive Role of Financial Technology: A Brief Survey of Literature

Several studies have been conducted to show the disruptive effects of Fintech on the financial services industry (Pollari, 2016; Ozili 2018; Romanova & Kudinska, 2016; Li et al., 2017; Buchak et al., 2018; Wolfe & Yoo, 2018; Tang 2019).

In the first instance, Fintech could interrupt banks and trigger risk and vulnerabilities in the industry. Although, often exaggerated as Pollari (2016) shows, that Fintech start-ups seek to compete directly with powerful financial institutions, many Fintech companies are seeking the opportunity to build

partnerships with financial institutions. Mature Fintech companies on the other hand, are trying to disrupt incumbents in the financial markets. Ozili (2018) in examining the effects of digital finance on financial inclusion and the stability of the financial system, emphasise that the problem with the Fintech platform is that they frequently draw high-risk clients who are considered very risky by traditional banks. Fintech providers become an alternative lender that risky borrowers can utilise because these clients' credit ratings or the findings of their credit risk assessments prevent them from receiving loans from regulated traditional banks. Excessive protection of Fintech providers by a large number of risky customers over time can jeopardise the stability of the financial intermediation process in the event of a massive failure of the risky loans.

Second, Fintech companies create a competitive environment that upstages the delivery of financial services within conventional wisdom which poses threats to banking industry's profitability. Scott et al. (2017) examines the effects of digital network innovation adoption on bank performance. The study finds a greater profitability impact for small banks than for large banks. Romānova and Kudinska (2016) show

that Fintechs provide additional risk for the banking industry to lose a portion of market share due to new competitors, pressure on margin, low bank revenues, high operational and fraud risk, and high bank dependence on financial services technology solutions. Li et al. (2017) found that there is a positive relationship between funding growth and transactions at Fintech firms with stock returns of incumbent US retail banks. This result shows that Fintechs complements traditional banking rather than providing a substitution or a disruptive effect. However, Fintech's rapid start-up growth may still have too little impact on the incumbent US retail banks. Mittal et al. (2016) noted that retail banks that do not adopt the digital model will experience a return on equity (ROE) of around 18.0 per cent over a five-year time frame, due mainly to the progress of Fintech and competitor banks. Conversely, if banks were able to adapt, there will be an increase in ROE of cost efficiency in financial services.

Third, Fintech companies that provide financial services due to their technological innovation, narrows the credit market share of banks. Buchak et al. (2018) in their study found that compared to shadow banks, Fintech providers served more creditworthy borrowers and were more active in the

refinancing market. Fintech providers appear to provide convenience rather than cost savings to customers. Tang (2019) examined whether the relationship between peer-to-peer lending is a substitute to bank lending or is complementary in the US. The finding showed that peer-to-peer lending is a substitute for bank lending. In addition, it also revealed that peer-to-peer lending expansion tends to occur in cases where borrowers, especially low-quality bank borrowers, already have access to banks credit. As a result, the quality of the peer-to-peer loans deteriorates. Wolfe and Yoo (2018) found that the volume of loans of the smaller commercial banks in rural areas deteriorated, and as a result, were forced to accept risky borrowers in response to the encroachment of peer-to-peer lending. However, five (5) different things were found to happen in urban areas, where large bank loans in such areas did not seem to be affected by the increased competition with Fintechs. Mittal et al. (2016) observed that borrowers in the US paid higher interest rates on loans from traditional banks than from Fintechs (Lending

Club³). Bank retail customers want to borrow from new digital players due to lower borrowing costs. Jagtiani and Lemieux (2018) found lending activities carried out by Fintech – Lending Club - in areas that were not served by conventional banks, such as, in highly concentrated markets and areas with fewer bank branches per capita. In addition, a high portion of loans was found by Fintech in areas with poor economic performance.

Fourth, the divisions of Fintech firms, and the kind of services they offer make them readily acceptable. Kim et al. (2015) in their empirical study focusing on mobile payment services, the authors noted that convenience and usefulness were critical in invigorating payment-type Fintech services. Similarly, Gomber et al. (2017) shows that such services as the digital payment service, digital investment, and digital insurance provided by the Fintech companies were functional and of beneficial effect to the digital progress in the financial industry. In addition, according to Tidebrant (2013), the new payments evolution by way of Fintech

³ the largest peer-to-peer lending player in the US.

represents a disruptive innovation on the Swedish payment ecosystem.

The literature revealed the disruptive and innovative capabilities of Fintech and their impact on the financial services sector. Leveraging the strands of literature within this realm can provide a backstopping background for understanding the growth of Fintech and its impact in the context of Nigeria's growing financial industry. To further deepen the Fintech ecosystem in Nigeria, lessons from other climes on actions and practices taken that fueled the growth of Fintech becomes imperative.

3.0 EVOLUTION AND DEVELOPMENT OF FINANCIAL TECHNOLOGY IN NIGERIA

The evolution and development of Fintech in Nigeria can be traced to the mid-80s when banks began utilising technology at the back and front-ends of their operations. The use of obtainable technology like telephone and computer in the advent of the Structural Adjustment Programme (SAP) in 1986, prompted enhanced competition in the banking sector⁴. Traditional banks have grown considerably and are still the main mode through which payments and remittances are facilitated. However, high transaction fees, occasionally slow and cumbersome procedures, and less availability in remote and economically unviable areas have caused slow penetration of financial services by these traditional financial institutions. The development fueled the emergence of Fintech start-ups in the area of payment and remittance services. Against this backdrop, banks were prompted to embrace technology and lessons learnt from the pioneer Fintech firms to leverage the Unstructured Supplementary

⁴ <https://www.owogram.com/top-fintech-companies-nigeria/>

Service Data (USSD), internet banking and mobile applications to improve their efficiency and service delivery.

The Payments System Vision (PSV) 2020 launched by the CBN in 2007 laid the foundation for the growth of the Fintech ecosystem in Nigeria. Prior to this period, only a few Fintech firms like Interswitch, Etranzact and Systemspecs were available, albeit a vague modus operandi. Furthermore, most financial transactions were primarily done with physical cash. The disadvantage of over reliance on cash was its high handling cost, risk of theft/loss and laborious transactions, as the CBN consistently used scarce resources to maintain and print banknotes, coupled with other challenges like vulnerability to fraud, terrorism and crime. Following the launch of the PSV2020, the CBN introduced the cash-less Policy in 2011, which along with several other policies and regulations such as- guidelines on operations of electronic payment channels in Nigeria, transactions switching and the regulatory framework for mobile money services in Nigeria, among others, helped reshape the operations of financial institutions and the Fintech industry, giving rise to the introduction of a more innovative payments system.

The CBN launched the National Financial Inclusion Strategy (NFIS) in 2012, with the target of lowering the adult financial exclusion rate from 46.0 per cent to 20.0 per cent by the year 2020 and guaranteeing that the formal sector covers 70.0 per cent of individuals to be included in the financial system by 2020. Subsequently, the PSV2020 Release 2, was launched in 2013, with the goal of enhancing risk management in the payments system. Furthermore, the CBN introduced the Bank Verification Number (BVN) in 2014, designed to improve banking security and reduce illicit banking transactions in the country. The BVN remains a huge success, particularly in the Fintech space as most Fintech companies relied on BVNs for proper identification with other relevant information needed.

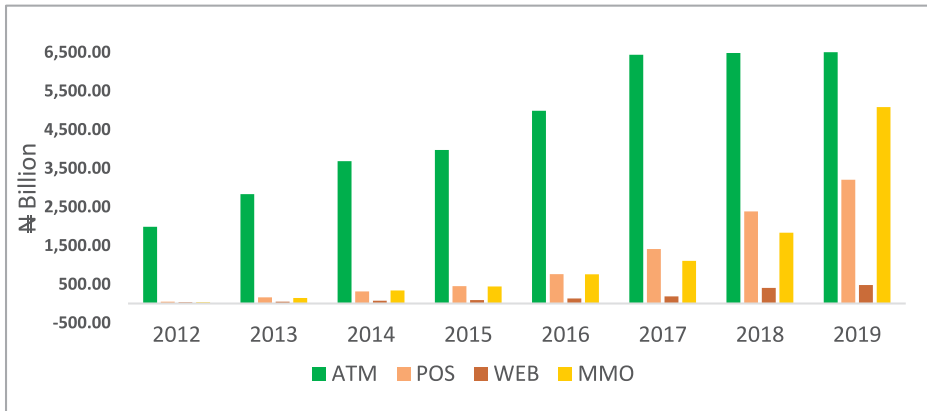
A major milestone in the Nigerian banking and Fintech landscape occurred in 2016, when SunTrust Bank Limited commenced operations and adopted a branchless strategy. Subsequently, Kuda, Sparkle, and other digital banks have begun to flourish. It was a remarkable innovation in the Fintech industry and encouraged several Fintech start-ups and emergence of other Fintech platforms, such as Flutterwave, Nairabox, Paystack, Paga, Piggybank, and

Remita, among others⁵. The increased growth of the Fintech industry prompted the CBN to issue several guidelines and codes to regulate Fintech processes. Currently, mobile payments and lending, payment processing, and personal finance are the predominant Fintech businesses in Nigeria.

Data shows the vast improvement and success of e-payment- Automated Teller Machine (ATM), Point of Sale Machine (POS), Mobile Money Operators (MMOs), Web transactions (WEB) and NIBSS Instant Payments (NIP) in Nigeria from 2012 to 2019, which highlight a continuous positive trend in the value and volume of transactions. These channels are the bedrock of the operations of Fintechs and their performance is very critical in paving the way and determining the progress of Fintechs companies. Mobile money is starting to play a vital role in increasing access and value of transactions through the channel experienced an exponential growth to ₦5.10 trillion in 2019, when compared with a meagre ₦31.50 billion in 2012.

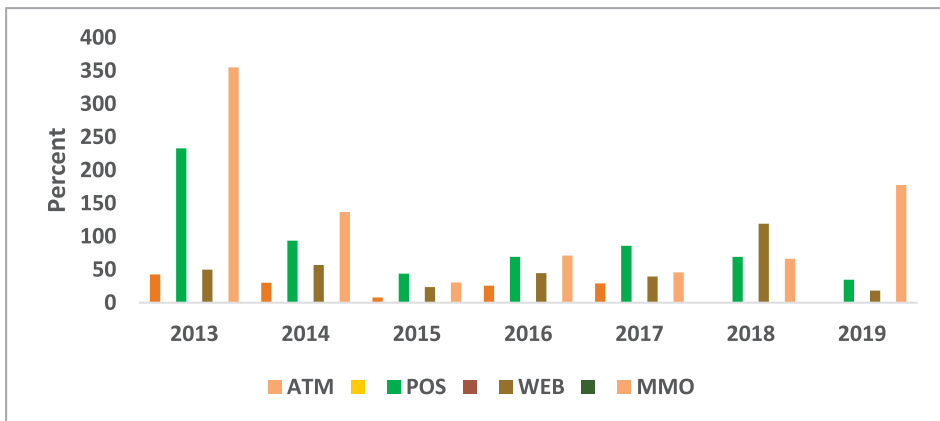
⁵ Anichebe, U. (2019). How Regulations Can Define the Future of Fintech in Nigeria. Available at SSRN 3354278.

Figure 2: Value of E-Payment Channels from 2012 to 2019 ('N' Billion)



Source: CBN Statistical Database.

Figure 3: Growth of E-Payment Channels from 2012 to 2019



Source: CBN Statistical Database.

Fintech companies like PiggyVest, Kuda, Paga, Interswitch, among others, have generally benefitted from this growth.

ATM transactions, hugely popular among Nigerians have been on a steady rise since 2012, with transactions growing by 228.1 per cent to ₦6.50 trillion in 2019. Point of sale Terminal (PoS) transactions, which is also gaining traction, grew rapidly to ₦3.20 trillion in 2019, compared with ₦48.50 billion recorded in 2012. The capability of the Nigeria Inter-Bank Settlement System (NIBSS) Instant Payment (NIP) to instantly send and receive money from any bank account at any time have greatly improved e-payment transactions. Consequently, transactions through NIP grew to ₦105.20 trillion in 2019, compared with ₦3.80 billion in 2012. Likewise, transactions on the web experienced a growth of 1,414.2 per cent to ₦478.10 billion in 2019, from its level in 2012, showing the high level of improvement within the period.

These developments have fueled the growth of various Fintech start-ups, with funding and capital importation from various private and public investments. From 2009 to 2019, Fintech companies in Africa grew by 24.0 per cent, fueled mostly by Nigeria, Kenya and South Africa⁶. A 2019 Report by

⁶ "Africa's fintech landscape has grown at an annual rate of approximately 24% over the last 10 years", EY, January 17th 2019. https://www.ey.com/en_za/news/2019/01/africa-fintech-landscape-has-grown-at-an-annual-rate-of-approximately-24-over-the-last-10-years

Partech Partners Africa stated that Nigerian tech start-ups attracted venture capital investments with a record high of US\$747.00 million in 2019, which accounted for 37.0 per cent of funding in Africa, representing a significant 585.3 per cent increase, compared with US\$109.00 million (16.9 per cent of Africa's total) in 2016. These developments highlight the success story and extent to which Fintechs have grown in Nigeria.

3.1 Gains of Fintech in Nigeria

The Nigerian financial sector has been open to new changes in the global financial system, particularly in the use of technology. The nation's digital payments industry remains under-tapped, which more Fintech companies can explore for opportunities and close the huge financial gap in the country. According to Frost and Sullivan (2018), Nigeria's Fintech industry has 210 and 250 firms and its revenue is anticipated to reach US\$543.30 million in 2022 from US\$153.10 million in 2017⁷. As the country's mobile and internet

⁷

https://www3.frost.com/files/9215/2871/4691/Digital_Market_Overview_FCO_Nigeria_25May18.pdf

penetration continues to climb, it has created an opportunity to support the banks' online payments, improve access to financial services to the unbanked and underbanked population and enhance financial literacy.

The financial services sector is receiving key support from the fast expanding Fintech industry as well, given that Nigeria presents a sizable market for digitalised unsecured loans and that Nigeria's low credit penetration offers significant opportunities. According to data from World Bank, Nigeria's domestic credit to the private sector (as a percentage of GDP) was 10.9 per cent as at 2018, compared with its Sub-Saharan Africa (SSA) counterparts like South Africa at 138.8 per cent, while the global average was 129.7 per cent. It is, however, imperative to note that, Nigeria's Fintech sector can leverage the population not yet been included financially. The NFIS of 2012 set targets of 80.0 per cent (formal and informal) financial inclusion and 70.0 per cent formal financial inclusion to be achieved by 2020. According to the NFIS strategy document for 2018, 63.2 per cent of Nigeria's 99.6 million adult population had access to financial services.

4.0 CHALLENGES OF FINTECH IN NIGERIA

4.1 Challenges

Despite the potential benefits of Fintech in Nigeria, there is still much to be done, due to the many challenges that stakeholders and industry professionals must overcome. These challenges have restricted the full operations of Fintechs in the country from maximising its full potential in the financial service sector. Therefore, the following are the challenges affecting the Fintech firms in Nigeria.

4.1.1 Limited Data Access

In Nigeria, accessing data is difficult, as the National Information Technology Development Agency issued a Data Protection Regulation in 2019, with the aim of regulating the mode and procedures for the collection, accumulation and processing of data. This policy has impacted Fintech firms in Nigeria since it always restricts the quantity of data that can be collected by them because it necessitates getting legal processing, which is time-consuming and susceptible to administrative limitations. Obtaining consent from data subjects, carrying out a contract to which the data subject

is a party, protecting the data subject's vital interests, adhering to a legal requirement, and serving the public interest are all examples of lawful processing for Fintechs. Given the volume of data that Fintechs will process, getting consent from data subjects may be quite challenging. Additionally, Fintechs are also required to make sure that third parties do not compromise the personal data obtained.

4.1.2 Inadequate Cyber Security

In a bid to provide personalised, consumer-friendly and convenient financial services by Fintech companies, new cybersecurity risks emerge. Most Fintech product/services run on mobile applications which often require access to personal and corporate information. With the increasing sophistication in cybercrimes, regulators and Fintech companies have an uphill task in ensuring the security of information on financial technology platforms. The perceived or proven inability of Fintech companies to guarantee the safety of subscribers' information, discourages the usage and regulation approval of certain Fintech products.

Most Fintech companies in Nigeria require a huge amount of money for cybersecurity to protect their operations, which is a setback for them. As a result, if the threat posed by poor cybersecurity is not addressed, information technology risks could eventually result in financial instability because as more start-ups attempt to exploit data, it will inevitably lead to possible customer data vulnerability.

4.1.3 Lack of Market Confidence

Customers prefer to transact with banks when it comes to financial matters, despite the innovative solutions offered by Fintech businesses. Despite being slower, "Brick and Mortar" banks are seen as being more secure than Fintech platforms. This is a result of users, especially those in older suburban demographics, lacking a clear understanding of the value proposition that the Fintech industry or firms deliver to them. The solutions that Fintechs are presenting to customers are unclear. Since the information made public cannot be used to make investment decisions, customers find it harder to trust businesses with limited resources. This has resulted in lack of customer's confidence in dealing with the Fintech firms and

requires Fintech companies to improve publicity and sensitisation around their products.

4.1.4 Access to Funding

A major hinderance to the development of start-up Fintech companies is access to affordable credit. Most Fintech companies are either start-ups or private limited companies with limited access to capital. The banks, as the last port of call, are often more disposed to partnering with Fintech companies or acquiring their Intellectual Property, particularly where the innovation is promising. Also, banks and investors are less willing to fund Fintech start-ups owing to the latter's characteristic deficit in quality collateral, informational opacity, uncertain income flow and return on investment, among other considerations. The inability of these businesses to secure funding constrains expansion.

Another challenge posed to Fintech companies is the capital requirements or shareholders' funds stated in the regulation. For instance, the CBN Licensing Regime stipulates that the highest licence must have shareholder capital of ₦5.00billion. This regulation defeats the objective of encouraging more

participation in the Fintech space, as most Fintech companies are start-ups and hardly meet the requirements stipulated for shareholder funds. The mainstream Fintech companies, which have foreign investors are not able to meet this amount. For instance, Paystack raised US\$10.00 million in 2019, amounting to about ₦3.60 billion which fails to meet the ₦5.00 billion threshold. Only few companies have been able to reach this threshold, with Flutterwave raising US\$20.10 million since its founding in 2016, amounting to approximately ₦7.26 billion. Thus, it is appropriate that future regulations accommodate the limited financial capacities of Fintech companies.

4.1.5 Institutional Knowledge Gap

Law enforcement agencies rarely understand the operations and processes of Fintech platforms. This tends to limit their capacity to investigate cyber frauds perpetrated on any payment platform. As can be observed from the Fine Pay scenario, their first step is to direct the merchant and/or Fintech company's bankers to place a lien on the account of the company, irrespective of the amount involved in the

alleged crime or in the respective merchant/Fintech company's account with the bank. Furthermore, regulators lack the innovative and disruptive skills and tools to adequately measure and regulate Fintech start-ups that are constantly innovating.

5.0 EXPERIENCES OF OTHER JURISDICTION

5.1 Fintech in South Africa

In recent years, South Africa's financial industry sector has been experiencing a dynamic change backed by the fast-growing Fintech landscape. The country's Fintech sector made up of half of the start-up companies and has the highest penetration, with 94.0 per cent of individuals having regular access to the internet and 67.0 per cent with a bank account. Mobile phone penetration is over 100 for every 100 people, this is due, mainly, to the rapid rise of the internet and e-commerce. Fintech creates the possibilities for using digital payments and processing them appropriately. As a result, the vast majority of payments in Fintech is third-party payment providers or payment services providers (PSPs). These Fintech enable retailers to accept electronic payments with a variety of payment methods (e.g. credit card, direct debit, bank transfer, and real-time bank transfer). The third-party segment is relatively developed. There have been comparatively few new entrants to this industry throughout 2017–2018.

With regards to Fintech lending in South Africa, there is a balance between lending to small and medium-sized enterprises (SMEs) and private persons. One of the biggest

online lending platforms is Pollen Finance, an online lender. The venture capital (VC) firms serve as the primary source of funding for new businesses in South Africa's Fintech industry. Crowdfunding and angel investors are significant sources of start-up finance in addition to conventional banks. The Fintech sector offers all of these financing options at various levels of development.

In terms of regulation and technology, the regulatory institutions and financial sector are in partnership with South Africa's IT services to use cloud computing and big data for information sharing. It is imperative to note that the South African Reserve Bank (SARB), does play a critical role in regulating the Fintech sector, through policies and initiatives like the SARB Fintech programme and a coordinated intergovernmental Fintech working group.

5.2 Fintech in Kenya

The Fintech revolution in Kenya has leapfrogged the country to achieve near-total financial inclusion with important advancements in payment services, insurtech, digital banking, and lending. A report from the 2019 FinAccess

Household Survey, in collaboration with the Central Bank of Kenya (CBK) and Kenyan National Bureau of Statistics (KNBS), reveals that 82.9 per cent of adults have access to at least one financial product.

Kenya's Fintech space is vibrant with products and services that are currently regulated under its existing financial services regulatory framework, which was created for more conventional products and services. Due to the positive achievements in Fintech, the country has been able to attract more investors as the telecommunications firm Safaricom has contributed around 5.0 per cent to its GDP. Further analysis of the CBK data showed that 46.1 per cent of the projected size of Kenya's GDP was made up of mobile money transactions. Kenya had year-over-year growth in mobile money transactions from 2015 to 2019. This is spearheaded by Safaricom's M-Pesa. Other Fintech companies in Kenya include payments platform such as, Cellulant, Insurtech grassroot- Bima and microcredit startup-Tala.

The CBK introduced Amendment Act 2021, which aims to address issues with consumer protection and public interest,

while preserving a supportive environment for innovation. In conclusion, Fintech in Kenya is considered to be well placed, considering its achievements in ensuring industry growth, innovation, and consumer protection.

5.3 Fintech in India

India, which has traditionally been cash-driven, has embraced Fintech with positive outcomes. This was due to an increase in e-commerce, smartphone penetration, and a young tech-savvy population. Since 2015, Fintech has grown significantly, with the development of several Fintech firms, incubators, and investments from private and public investors. This can be seen in the growth of India's Fintech adoption rate of 87.0 per cent in 2019 from 52.0 per cent in 2016, higher than global averages (EY Fintech Adoption Index 2019).

The government has been very instrumental in the rise of Fintech firms in India. For instance, the Government of India launched the Start-Up India initiative in January 2016 with a US\$1.50 billion fund for start-ups. The Ministry of Finance proposed to eliminate the surcharge on online and card

payments for using government services, as well as tax rebates for businesses accepting more than 50.0 per cent of their transactions digitally, tax rebates of 80. 0 per cent on start-ups' patent costs, and income tax exemptions for new businesses for the first three years (Vijai, 2019).

The elevated awareness was largely credited to the government's publicised plan in 2017, to decrease the amount of paper currency in circulation. The reserve bank of India (RBI) also used a light-touch approach to Fintech regulation as development was still emerging, but with good progress made, the regulator is now moving towards a full regulation model. The RBI amended the KYC Master Directions in 2016 to maintain identity verification by all entities under its regulation. The Ombudsman Scheme for Digital Transactions was released by the RBI in 2019 to allow users to raise concerns about a variety of issues, including refund difficulties, poor service, and unauthorised money transfers.

All these improvements have aided the growth and transformation of Fintech in India. In a 2016 analysis, KPMG forecasted that the Indian Fintech software market will

expand from US\$1.20 billion in 2016 to US\$2.40 billion by 2020 and that the transaction value for the Fintech industry would increase by 22.0 per cent over five years, from US\$33.00 billion in 2016 to US\$73.00 billion in 2020. In India, Money transfer, remittances, and payments are the main services offered by Fintech companies, while payments and remittances as well as, market place lending are the sectors with the highest Fintech investments (EY Fintech Adoption Index, 2019). With more improvement in technology and innovation, Investments are shifting to other sub-segments including investing, lending, wealth management, credit reporting, among others, as Fintech is evolving from more than just payments technology.

The conventional financial institutions are also seeing a vital shift in their way and manner of doing business, with the advent of the Fintech sector. Before, they had competing Fintech products, and for some time, the landscape was divided into banks competing with the non-bank players. They are now leveraging their strengths, with banks viewing Fintech as an enabler and a strategic close partner, rather than a disrupter. To expand their presence in the Fintech sector, banks are investing in a number of Fintech companies.

They are also partnering with these companies and developing partnerships on a range of platforms, including wallets, investment intermediation, and online customer acquisition, among others. They are starting to invest in such platforms and creating platforms for such start-ups to succeed.

5.4 Fintech in Egypt

Egypt has one of the leading and most promising Fintech markets in the Middle East and North Africa (MENA) zone and by 2018 had almost 20.0 per cent of Fintech companies in that region. The drivers of its growth are numerous and helped by the country's large economy, young population, developed banking infrastructure, favourable labour costs, the wealth of skilled human capital and its strategic position centered around five time zones covering Europe and the Middle East. The country is also among Africa's top 5 internet markets and the largest mobile phone users among MENA countries with a 95.0 per cent mobile penetration rate. Currently, more than 45 Fintech players operate in fields such as consumer finance, savings, payment solutions, mobile

cash, mobile wallets, crowdfunding, capital raising, e-commerce, telecom and cryptocurrency.

Despite the progress Fintech has made in Egypt, it is yet to reach its potential and optimal standing due to some challenges. Transaction fees on digital transactions are higher than the cost of cash transactions increasing merchants and customer's appetite for the traditional financial institutions. Egypt also has a very slow internet speed when compared to the MENA region and other countries globally. According to the October 2019 Speedtest Global Index, Egypt ranked 131 out of 176 countries in broadband speed and 107 out of 141 countries in mobile internet speed. Lack of funding is another problem, despite the country being the second most active Fintech startup hub in the MENA region.

According to the MENA Fintech Venture Report 2019, Fintech start-ups accounted for 7.0 per cent of total funding (in value terms) allocated to MENA Fintech ventures, trailing behind Bahrain and Lebanon with 9.0 per cent each. There have also been limits on digital and mobile transactions and a developing regulatory environment. However, there have been collaborative efforts of the Egyptian government and

the Central Bank of Egypt (CBE) to kick start the industry's growth, upgrade payment systems, drive the economy to mostly cashless transactions and make Egypt a regional Fintech hub.⁸

In February 2017, the National Council for Payments was established to support fewer cash transactions. Furthermore, in response to the development in digital credit lending and crowdfunding, the e-commerce law was established, along with several economic and regulatory reforms. The CBE also licensed 7 banks to provide QR code acceptance and issued the Contactless Payment Regulation, permitting the use of NFC payments & Wearables for the first time in the Egyptian Market. In addition, customers were registered on mobile money, to be able to consummate digital merchant payments. In 2016, the CBE issued new regulations for cashless payments with the use of smartphones through mobile wallets.

⁸ 41 Lendlit FinTech, 2018, Opcit, p.7

42 Clifford Chance, FinTech in the Middle East: An overview, October 2017, P:11

In March 2019, the CBE set up a US\$60.00 million fund to back fintech start-ups in a three-year, multilayered strategy, which also includes setting up Fintech Egypt, an in-house Fintech platform and digital research lab with the aim of connecting all ecosystem players including financial institutions, start-ups, investors, policymakers and service providers. The Ministry of Finance augmented the process by mandating that payments be made electronically for government fees above EGP 500 from May 1, 2019. In response, 16,000 PoSs were installed by banks at governmental entities providing public services.

5.5 Fintech in Mexico

Mexico has a growing Fintech ecosystem that is one of the most developed in Latin America and thus one of the leading drivers of financial innovation in the region. The country has the biggest Fintech hub in its region, with more than 441 start-ups. By end-2020, Fintech start-ups increased by more than 14.0 per cent, with Insurtech and the digital banking segments recording significant growth. According to data by Finnovista and the Inter-American Development Bank in 2020, payments and remittances was the most developed

segment with 90 start-ups, followed by consumer lending and enterprise financial management having 52 start-ups each, and enterprise technologies with 51 start-ups.

This surge in Fintech is aided by its readily available youthful and tech-savvy consumers, further boosted by high internet access and the low penetration of financial services. According to data from the National Institute of Statistics and Geography (INEGI), 30 million Mexicans are between 15 and 29 years of age, at least 80 million Mexicans enjoy internet connectivity and more than 75.0 per cent of residents possess a mobile phone. Similarly, 9 out of 10 users of cellphones have a smartphone with an internet connection, while 6.0 per cent of people from 18 to 70 years old have access to financial products (INEGI, 2018). Conversely, there are 13.7 bank branches for every 100,000 people (World Bank, 2019), leaving a gap for the Fintech companies to explore.

The government took major steps to drive the Fintech innovation ecosystem by delivering stable and sustainable monetary and fiscal policies, as well as providing a welcoming business environment for investors. This has garnered high credibility in international markets. The

enactment of the Fintech Law in 2018 made Mexico the first jurisdiction in Latin America to insert an explicit Fintech legal framework. The Fintech Law regulates crowdfunding institutions and electronic money and payments institutions. It also covers other areas like open banking standards, cryptocurrency guidelines and the procedure for the Regulatory Sandbox operations.

5.6 Lessons for Nigeria

The diverse experiences of the different countries reviewed were illuminating in several ways. The following are lessons for Nigeria:

- i. Improve digital infrastructure: Although there have been great strides in technology and innovation, broadband and mobile internet speed are necessary for any country to achieve improved growth. Nigeria has a youthful population with over 50.0 per cent of its populace below the age of 35. This represents a huge opportunity for Fintechs to expand. This is against the backdrop that youths are generally more receptive to technological

innovation and development⁹. Consequently, more Nigerians are likely to embrace digital financial services and products.

The National Broadband Plan targets a broadband penetration of 70.0 per cent in 2025, from 37.8 per cent in 2019. The increasing availability of affordable internet, growing number of mobile phone subscribers, and increasing sophistication of payments system infrastructure based on the poise of the Payments System Vision 2030 are likely to open new markets for Fintech companies in Nigeria.

Fintech products developed in Nigeria would be able to interact with corresponding financial service providers of Nigerians in Diaspora, such that beneficiaries in the most remote villages in Nigeria, could be credited directly on their mobile devices. This potential for Fintech development also applies to the urban-rural dichotomy, by facilitating money

⁹ According to Center Forward (2017), age bracket 24-34 is most likely to adopt Fintech.

transfers across towns and cities without necessarily resorting to a bank. The potential would be increasingly realised as broadband and mobile telephone subscription increase.

Nigeria ranked 99 for mobile speed and 146 for broadband speed in June 2021. For Fintech to thrive and advance, Nigeria needs to further up-scale broadband and mobile speed infrastructure as an enabler for fast and well-developed network connectivity.

- ii. Develop capacity to counter cybersecurity risks: According to the internet crime report developed by the Federal Bureau of Investigation (FBI) in 2020, Nigeria ranked 16th among countries in the world that were grossly affected by internet crime. Consequently, the government should strengthen its capacity to deal with the increasingly complex cybersecurity scenario. This entails making sure capacity- and skill-building programmes are put into action, which will call for sector knowledge, regulatory frameworks, and supervisory procedures that protect the stability of the financial system.

- iii. Lack of funding is another problem affecting the growth of Fintech in Nigeria, especially when compared to other countries. Apart from some intervention funds or tax rebates that several SMEs and some start-up companies can apply for, there is no special fund focused on increasing the Fintech space in the country. Looking at India, the Government used aggressive policies to make great strides in Fintech growth, moving the Fintech adoption rate from 52.0 per cent in 2016 to 87.0 per cent in 2019. For instance, the Start-Up India program was introduced by the Indian Government in January 2016 and included US\$1.50 billion in funds for start-ups. There were also tax rebates for merchants and several Fintech start-ups. In March 2019, the CBE set up a US\$60.00 million fund to back Fintech start-ups. The Ministry of Finance mandated electronic payments for government fees above EGP 500.
- iv. High transaction fees are another headwind affecting Fintech in Nigeria. As in the case of Egypt, when transaction fees on digital transactions are higher than the cost of cash transactions, merchants and customer's appetite for the traditional financial institutions would

continue to rise. In Nigeria, merchants and customers have always complained of high transaction costs and these leads to a lot of businesses still consummated with cash. This has not aided in the growth of Fintech and continues to be a headache for the Government, the CBN and other relevant stakeholders.

- v. Building Partnerships (Telecoms and financial Service providers): The traditional financial institutions should see Fintech as enablers, partners and positive disruptors, rather than competitors or displacers. In India, Fintech growth is largely attributed to the synergy between the banks and Fintech as they are now leveraging on their strengths. In Nigeria, partnerships are beginning to emerge and banks have started investing but not enough for the required transformation.
- vi. Skilled manpower is required to drive the advancement of Fintech. India and Egypt have a thriving Fintech sector due to an abundance of skilled manpower, with technical knowhow. Creating incubation and acceleration hubs in Nigeria's tertiary institutions will spur

manpower development and equip young Nigerians with digital skills.

- vii. Capitalise on COVID-19 digital transformation: The COVID-19 epidemic has increased connectivity and reliance on digital technologies worldwide. In order to meet demand during the lockdowns, e-commerce platforms, Fintech solutions, and online payment systems were used in Nigeria. These solutions were easily accessible, reasonably priced, safe, and quick. The government should collaborate with Fintech firms to develop digital solutions and enhance its procedures, particularly in transfers and remittances, now that these advantages have been made clear. The government, regulators and other key players should also aim policies at developing digital financial solutions and supporting the required infrastructure. Furthermore, they should fast-track reforms in pertinent areas like the use of mobile money, interoperability, and digital ID.

6.0 CONCLUSION AND POLICY RECOMMENDATIONS

In Nigeria, Fintechs are indeed reshaping the financial services industry. One of its major effects is that it opens up opportunities for financial inclusion, bringing financial services to the doorsteps of every Nigerian and providing a wide range of personal finance solutions for individuals and organisations to choose from. Nigeria's large youthful population and its successful Fintech start-ups shows the immense potential of the country to have the most important Fintech ecosystem within the African continent. Despite the role that Fintech plays in the economic transformation of Nigeria, it is imperative for the government and other key stakeholders to support initiatives that stimulate their growth. Against this background, this study recommends the following to support the growth of Fintech in Nigeria.

- I. Internal governance frameworks and strategies on cybercrime mitigation need to be tightened to bridge the trust gap and encourage more participants;
- II. Fintechs and banks should now, more than ever, collaborate more and focus on strengthening their

digital infrastructure platforms and systems;

III. The Securities and Exchange Commission should encourage investment in local Fintech start-ups by simplifying the process of listings on the capital market;

IV. There should be collaborations between the CBN and other regulatory agencies, such as, the SEC and NCC to provide a unified regulatory system for coordinating the activities of Fintechs.

REFERENCES

- Aaker, D. A., & Keller, K. L. (1990). Consumer evaluations of brand extensions. *Journal of marketing*, 54(1), 27-41.
- Brandl, B., & Hornuf, L. (2017). Where did fintechs come from, and where do they go? The transformation of the financial industry in Germany after digitalisation. Working paper. University of Jena and University of Bremen.
- Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2018). Fintech, regulatory arbitrage, and the rise of shadow banks. *Journal of Financial Economics*, 130 (3), 53-483.
- Chishti, S., & Barberis, J. (2016). *The Fintech book*. Wiley.
- Cortada, J. (2004). *The digital hand, how computers changed the work of American manufacturing, transportation, and retail industries*. Oxford University Press.
- Financial Stability Board. (2019). Fintech and market structure in financial services: Market developments and potential financial stability implications - Financial Stability Board.
- Finnovista and Inter-American Development Bank. (2021). Fintech Radar. <https://www.finnovista.com/en/radar/the-number-of-Fintech-start-ups-in-mexico-grows-14-in-one-year-to-441/>.
- Frame, W., & White, L. (2014). Technological change, financial innovation, and diffusion in banking. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2380060.
- Frost, S. (2018). *Sustainable and innovative personal transport solutions—Strategic analysis of carsharing market in Europe*. Frost & Sullivan.

- Gelis, P., & Woods, T. (2014). The rise of Fintech in finance: How Fintech is reshaping the finance sector and how you handle your money. *Research Paper, Kantox*.
- Gomber, P., Koch, J. A., & Siering, M. (2017). Digital finance and fintech: Current research and future research directions. *Journal of Business Economics*, 87(5), 537-580.
- Hannan, T. H., & McDowell, J. M. (1984). The determinants of technology adoption: The case of the banking firm. *The RAND Journal of Economics*, 328-335.
- Holotiuik, F., Klus, M. F., Lohwasser, T. S., & Moormann, J. (2018). Motives to form alliances for digital innovation: The case of banks and Fintechs. In *Bled eConference 22*.
- National institute of statistics and geography. (2018). Encuesta nacional de inclusión financiera. <https://www.inegi.org.mx/programas/enif/2018>.
- Jagtiani, J., & Lemieux, C. (2018). Do Fintech lenders penetrate areas that are underserved by traditional banks? *J. Journal of Economics and Business*, 100, 43-54
- Jun, J., & Yeo, E. (2016). Entry of Fintech firms and competition in the retail payments market. *Asia Pacific Journal of Financial Studies*, 45(2), 159-184.
- Kim, Y., Park, Y. J., Choi, J., & Yeon, J. (2015). An empirical study on the adoption of "Fintech" service: Focused on mobile payment services. *Advanced Science and Technology Letters*, 114(26), 136-140.
- Koffi, H. W. S. (2016). The fintech revolution: An opportunity for the west african financial sector. *Open Journal of Applied Sciences*, 6(11), 771-782.
- Laven, M., & Bruggink, D. (2016). How Fintech is transforming the way money moves around the world: An interview with Mike Laven. *Journal of Payments Strategy & System*, 10 (1), 6-12.

- Lendlt Fintech (2018). A roadmap for Fintech firms entering fast-growing emerging markets. Dubai International Financial Center
- Lerner, J., & Tufano, P. (2011). The consequences of financial innovation: A counterfactual research agenda. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1759852
- Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of FinTech start-ups on incumbent retail bank's share price. *Financial Innovation*, 3(1), 1-16. <https://doi.org/10.1186/s40854-017-0076-7>.
- Mittal, S., Joshi, D., & Lin, L. S. (2016). Digital banking: New avatar – banks watch out for banks. DBS Asian Insights, September 2016.
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340.
- Parameshwar, H., Sruthie, A., Cisse, M., Kumar, M. A., & Misra, S. (2019). Fintech and disruptions: An impact assessment. *Journal of Critical Reviews*, 6(6), 89-97.
- Pollari, I., & Ruddenklau, A. (2019). Pulse of Fintech H2 2019.
- Pollari, I. (2016). The rise of Fintech opportunities and challenges. *JASSA*, 3, 15-21
- Pullaro, R. (2017). Fintech, Content Analysis of Fintech in Higher Education. Long Island University.
- Puschmann, T. (2017). Fintech. *Spring Journals*, 59 (1), 69-76.
- Romānova, I., & Kudinska, M. (2016), Banking and Fintech: A Challenge or Opportunity? *Contemporary Studies in Economic and Financial Analysis*, 98, 21-35.
- Schindler, J. (2017). Fintech and financial innovation: Drivers and depth. FEDS Working Paper No. 2017-081. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3029731

- Scott, S. V., Van Reenen, J., & Zachariadis, M. (2017). The long-term effect of digital innovation on bank performance: An empirical study of SWIFT adoption in financial services. *Research Policy*, 46(5), 984–1004.
- Tang, H. (2019). Peer-to-peer lenders versus banks: Substitutes or complements? *The Review of Financial Studies*, 32(5), 1900–1938.
- Tidebrant, P. (2013). Disruptive innovation in the Swedish payment market: A supply-side perspective. Master of Science Thesis. Stockholm: KTH Industrial, Engineering and Management.
- Tufano, P. (2003). Financial innovation. *Handbook of the Economics of Finance*, 1, 307-335.
- Vijai, C. (2019). Fintech in India—opportunities and challenges. *SAARJ Journal on Banking & Insurance Research (SJBIR)*, 8.
- Villeroy de Galhau, F. (2016). Constructing the possible trinity of innovation, stability and regulation for digital finance. *Fin. Stab. Rev*, 20, 7-16.
- Wolfe, B., & Yoo, W. (2018). Crowding out banks: Credit substitution by peer-to-peer lending. Available at SSRN:
- World Bank. (2019). Bank branches for every 100,000 adults. [www.fsb.org/emailalert%0Ahttp://www.fsb.org/2019/02/Fintech-and-market-structurein-financial-services-market-developments-and-potential-financial-stabilityimplications/](http://www.fsb.org/2019/02/Fintech-and-market-structurein-financial-services-market-developments-and-potential-financial-stabilityimplications/).
- Zavolokina, L., Dolata, M., & Schwabe, G. (2016). Fintech-What's in a Name? At the Thirty Seventh International Conference on Information Systems, Dublin, 1-20.

Appendix

	ATM	PoS	WEB	MMO	NIP
2012	1,984.99	48.46	31.57	31.51	3,890.26
2013	2,830.53	161.21	47.32	143.37	10,848.73
2014	3,681.98	312.07	74.21	339.24	19,921.50
2015	3,971.65	448.51	91.58	442.35	25,540.84
2016	4,988.13	759.00	132.36	756.90	38,109.06
2017	6,437.59	1,409.81	184.60	1,102.00	56,165.67
2018	6,480.09	2,383.11	404.60	1,830.70	80,423.03
2019	6,512.61	3,204.75	478.14	5,080.96	105,222.56

LIST OF OCCASIONAL PAPERS

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33	The Remittance Environment in Nigeria	November 2008	A Englama; N. C. Oputa; H. T. Sanni; O. O. Duke; G. K. Sanni; M. U. Yakub; T. S. Ogunleye; F. U. Ismail; O. Adesanya ; Z. Sani and D. I. Osori.
34	Nigerian Strategic Grains Reserves and Stabilisation of Agricultural Market Prices Purpose, Effects	November 2008	Emmanuel Ukeje; Bandele A. G. Amoo; Emeka Eluemunor and Nkenchor Igue
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			Odey, Mbutor O. Mbutor, Olugbenga M. Adebayo, Nkereuwem I. Akpan, Nkenchor N. Igue, Derek Ibeagha, Maximillian Belonwu and Shettima T. Zimboh
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