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An Assessment of the Level of Adoption of Financial Technology (Fintech) by Nigerian Banks

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Abstract

The emergence of Financial Technology (Fintech) has brought to the forefront the importance of technology in the delivery of banking services. Banking services are now being driven by innovative business models and technology causing creative destruction in the financial system. This study assessed the level of adoption of Fintech by Nigerian commercial banks. Using qualitative analysis, the results revealed that the extent of adoption of Fintech by majority of the banks sampled is at a medium level, and the common Fintech innovation adopted among the banks are money transfer and payment. In addition to this, spearman correlation analysis showed that Fintech innovation has a positive relationship with in-house R&D activities (IRD), collaboration with external companies (CEC), hardware technology acquisition (HTA) and software technology acquisition (STA). Multiple regression analysis showed that Fintech innovation adoption and software technology acquisition have a positive and significant impact on the banks' financial performance. Few of the challenges of Fintech adoption by the banks are poor understanding/acceptance and distrust of Fintech innovation by customers, difficulty in finding reliable cooperation partners for Fintech innovation, lack of adequate information on Fintech and regulatory challenges. This study suggests that appropriate investment in R&D and software technologies, finding collaborative Fintech partners by the banks, providing a better regulatory environment by government regulators and creating awareness about Fintech to sensitize customers should be given utmost attention in order to achieve a robust service delivery banking system which could foster wealth creation and overall sustainable economic growth.

Keywords: Financial Technology, Innovation, Nigerian banks, Sustainable Economic Growth

INTRODUCTION

Development in information technology over the past few decades has transformed the way banking services are provided. Specifically, the emergence of Financial Technology (Fintech) has brought to the forefront the importance of technology in the delivery of banking services. Fintech are the technologies that are being used to provide financial services of all kinds. In the banking sector, few companies termed *Fintech companies* now provide all the retail banking services which were previously the exclusive right of the incumbent bank (Chishti and Barberis, 2016). The participation of *Fintech companies* in the delivery of banking services is seen as both a threat and an opportunity for the incumbent banks.

As a threat, Fintech has required technology to meet the expectations of customers for speed and convenience of service which are changing fast. Customers, as Accenture (2017) noted, now demand technology based banking support. This has put the incumbent banks in a very difficult position as they do not have the technologies that match that of the *Fintech companies* (Navaretti *et al*., 2017). The use of technology in providing faster and user friendly services has made Fintech more popular and acceptable (Dorfleitner *et al*., 2017). Similarly, the ability of Fintech to break the relationship between the banks and their customers and win the confidence of the customer is a matter of great concern to banks (Xavier, 2017).

On the other hand, banks also see Fintech as an opportunity. First and foremost, banks desire to incorporate Fintech into all facets of their businesses by setting up their own Fintech. For example, banks across the globe now use mobile phones to provide banking services for those who do not have a bank account, and launch digital banking platforms among others. Similarly, the rapid growth of the Fintech industry has provided the banking sector with an opportunity to collaborate with *Fintech companies* and gain from their innovative abilities. Banks have goodwill and the trust of the customers but lack innovative capacity to solve multifaceted problems. Fintech companies, on the other hand, gain from using the legacy systems of banks instead of building one for themselves. This sort of collaboration, Manthorpe (2017) noted, is what led to the emergence of "Open Banking." Furthermore, the development of Fintech is seen by banks as an easy option to adopt *Fintech companies*. Instead of developing their Fintech internally, banks now avoid internal development costs by acquiring Fintech companies (Kerenyi *et al*., 2018).

On the basis of the above, banks across the world have been adopting Fintech in order to improve their services and gain a competitive edge by either partnering or acquiring existing or establishing their own Fintech companies (Webster and Pizzala, 2015). Despite the fact that this practice is becoming very rampant in developed economies, little is known about this in the developing economies, especially in Sub-Saharan Africa. This led to a dearth of scientific research on Fintech in Nigeria. It is against this background that this study is undertaken to investigate the level of the adoption of Fintech by Nigerian banks and also to assess the likely constraints or challenges they face in their efforts toward institutionalizing Fintech in their banks.

LITERATURE REVIEW

Meaning and Operation of Fintech

Fintech stands for financial technology and is referred to computer software and other technologies employed to support banking and financial service delivery (Schuffel, 2016). It is a technology based invention that led to the emergence of new business models, processes, application and products that have significant influence on the financial markets and services (Derfleitner *et al*., 2017). It is simply the application of financial technologies in the financial industry to improve financial activities (Schuffel, 2016). Fintech companies comprise both startups and established companies that are aiming to replace or at least improve the use of financial services provided by incumbent financial companies and operates in three main three segments of financial market namely; finance, asset management, and payment.

In the finance segment, Fintech companies provide financing services to individuals and corporations in a number of ways including crowd funding and crowd lending. In crowd funding, Fintech facilities consist of face-to-face lending between individuals or companies. In the case of crowd lending, Fintech platforms connect companies that are seeking for capital with investors who are willing to lend directly to businesses. One of the benefits of using this platform is that fundraising can be easily set up online to quickly market products and at the same time provide feedback relating to the product (Augustine,

2015). Similarly, the use of crowd funding to raise funds, Conrad (2012) noted, could help to remove all marketing costs that users incur in hiring consultants and other support organisations.

In the asset management segment, Fintech provides three main services, namely; social trading, robo-advice and personal financial management. Social trading involves a social network in which an investor can see, deliberate and copy investment collections of other participants in a social network (Liu *et al*., 2014). The benefit here is that each member of a social network can gain useful investment information from group members. Robo-advice, according to Accenture (2015), is the application of digital systems to create and manage pools of traded funds and other instruments for investors. It is algorithm based and sometimes takes decisions. The main objective of robo-advice is to reduce to the barest minimum the involvement of people in the management of investment (ESA, 2015). Investors are charged fees relative to their investment by the providers of robo-advice services.

The payment segment is the main area where the Fintech functions. Here Fintech offers digital payment options that operate both within and outside conventional banking payments systems. For example, there is the e-wallet which stores payment card data securely that be used to make real-time transactions (Roubini and Mihm, 2017). Similarly, there is the mobile payment system which enables mobile phone users to effect payment by the use of their mobile phone (Merritt, 2010). There are other similar payment systems that allow people to transact without stepping into the banking hall.

Banks' Adoption of Fintech Solutions

Literature on Fintech has suggested a number of strategies banks employ in implementing Fintech solutions (Webster and Pizzala, 2015; Kerenyi *et al*., 2018). Broadly, these strategies can be grouped into three, namely; internal development, acquisition and collaboration.

Banks are setting up innovation laboratories (labs) and research and development units (R&D) to develop and institutionalise Fintech (Webster and Pizzala, 2015). The laboratories, according to Oshodin *et al*. (2017), are used to develop and test technology like blockchain. In the same vein, labs could foster innovation via investment with other participants in the financial ecosystem (Akinwale, 2018a). A number of banks have established laboratories. DB Global Technology, for example, has established a lab in Silicon Valley in partnership with the North Carolina University (Sposito, 2013). CapitalOne of the United States has established three labs in three states in the United States, namely; New York, San Francisco and Washington DC. In Nigeria, a number of banks have developed their Fintech. For example, Guaranty Trust Bank (GTB) has developed GTPay, First Bank introduced FirstPayLink while the United Bank for Africa (UBA) has launched U-Collect. These are mobile payment systems that provide mobile banking to many Nigerians that do not have access to the internet. In addition to setting up labs, banks also develop their Fintech by setting up venture capital funds. A good example is the Japanese Sumitomo Mitsui Asset Management that set up the Global AI Fund with over JPY 70 billion to develop artificial intelligence technology for financial applications worldwide (Kodama, 2016). Equally, the Mizuho Securities of Japan has proposed to raise over JPY 2 billion to invest in Singaporean Fund to finance promising Fintech in Asia.

Acquisition is another strategy used to adopt Fintech solutions. Many acquisitions have taken place especially in the United States and recently a total of six acquisitions were made involving JPMorgan, Credit Suisse, BNP Paribas, and TD Bank with each of them making for the period between 2013 to 2018 (Fintech Futures, 2018). Although it is the least option for the banks (Ernst and Young, 2017), acquisition can increase a bank's digital footprint and also fast track the development of new technology. Investment in Fintech in 2018 has reached a global total of $111.8 billion from just $50.8 billion in 2017 (KPMG, 2019) involving mammoth acquisition deals such as Vantiv's acquisition of Worldplay for $12.86 billion and Blackstone's investment of $14 billion in Refinitiv (KPMG, 2019). While investment in Fintech is on the raise globally, it is more pronounced in the Americas, Europe and Asia than other parts of the World. KPMG (2019) noted that the increase was driven mainly from the United States and the Americas where annual volume of transactions is increasing yearly. In Nigeria, recently OneFi, a Lagos based startup company, took over Amplify (Bright, 2019). Bright (2019) also noted that OneFi is looking to expand its reach to other African countries including Senegal, Ghana, and Cote d'Ivoire, among others.

While acquisition is a good strategy, many banks choose to collaborate and cooperate with Fintech companies instead. One of the reasons suggested is the complementary strength banks have with Fintech

companies. Fintech companies have the upper hand in innovation and technology while banks have customer base and infrastructure to build technology on. For example, banks provide Application Programme Interface (API) which is a platform that allows third parties to access information relating to banks customers and create applications and services around the bank. This collaborative effort has led to what is now called "Open Banking" (Manthorpe, 2017). In Nigeria, the United Bank for Africa (UBA) provide a savings platform called "PiggyBank.ng" which is a Fintech platform that enables individuals to save money. This Fintech platform enables a person to save by automating the savings procedures such that a certain amount is deducted in the person's account directly. In the same vein, Sterling bank also introduced what is called "Social Lender" which is a lending platform based on the social status of an individual on a social media platform. This Fintech provides opportunity to people who have restricted access to formal loans to borrow from the bank in accordance to their social reputations. Banks no longer see Fintechs as disrupters but rather complementary. In this regard, Deloitte (2018) suggests that Fintechs are here to power than to disrupt banks.

Banks' Challenges and Difficulties in Adopting Fintech
The adoption of Fintech is an easy ride for the banks. No matter how good the strategies are, as explained above, there are certainly a lot of hurdles along the way. First and foremost, there is the issue of regulation. Banks face a wide range of uncertainty regarding the way in which regulation and supervision will affect their businesses from the adoption and use of Fintech. This is a fundamental problem for banks because banks are wary of the regulatory and supervisory related risks that they may be exposed to on the adoption of Fintech. Regulators and supervisors have been identifying risks related to Fintech and are appropriately responding. According to KPMG (2019b), regulatory response to Fintech is moving on from high level principles. Regulators, KPMG (2019b) noted, are relying on current regulations and rules to come up with more detailed application of new rules and guidance to specific aspects of Fintech.

Another challenge banks face in adopting Fintech is how to move away from old legacy that the banks have relied on for decades to new technology. These legacy systems were built over decades ago and it will be a complex issue to scale them down or dismantle them without disturbing the structure upon which the banks rest. Linked to this difficulty is the decision to implement the change. One approach is to consider launching front-end applications that will provide easy and user-friendly interface to the customer just to allow the banks to stay relevant in the financial market. Another approach is for banks to dedicate one team for the maintenance of its legacy system and another team for the development of whole new system. Similarly, there is the related issue of how the banks manage change related problems such as trust (Busco *et al*., 2006), inertia (Miller and Friesen, 1980), lack of knowledge (Scott, 2001), and decoupling (Dambrin *et al*., 2007), among others.

Another challenge facing banks regarding Fintech adoption is the misunderstanding of the technical abilities of the various Fintech services. Many banks still do not understand what some of the Fintech products and services are. For example, according to Team (2017), many companies (including banks) have heard or are even using bitcoin as a form of payment but might not understand how it works efficiently or what other things the technology can do.

Furthermore, lack of awareness or distrust of bank customers of the Fintech phenomenon is also an issue that influences the level of Fintech adoption by banks. For example, in an investigation carried out by Grazel (2017), it was discovered that customers trusted banks more than Fintech. Specifically, banks were rated higher than Fintech in terms of fraud protection, quality of services and transparency. Thus, despite the arguments in favour of Fintech in terms of service delivery in the literature (e.g. Dorfleitner *et al*., 2017), customers are more glued to conventional banking services than Fintech services. This is arguably one of the main difficulties banks faces in their decision to implement Fintech.

Finance is also another challenge for banks. Technological adoption is often very costly for a number of reasons. First, banks have less expertise on Fintech innovation. This suggests that employees need to be trained. If operations are required to be shut down to integrate the Fintech solution there will be output lost cost. Where the bank is uncertain of the demand for the Fintech solution it is adopting, it will be difficult for it to determine whether or not they can recoup the cost of adopting the Fintech solution. This will put the bank in a very difficult position to decide whether to adopt or not to adopt the technology.

For example, Helper (1995) found that customers' commitment is fundamental both directly and indirectly in technology adoption. Similarly, banks' structural characteristics also pose challenges to their efforts toward implementing Fintech. For example, Gallego *et al*. (2011) and BenYoussef *et al*. (2010) found that large firms are more likely to adopt technology than small banks. On the other hand, Bocquet *et al*. (2007) and Hollenstein (2008) found an insignificant relationship between firm size and technological adoption. Similarly, asserted is that the adoption and use of technologies depend on a firm's absorptive capacity which is the ability of the firm to value, integrate, and apply new knowledge to improve their innovative performance (Cohen and Levinthal, 1999).

Environmental factors also influence the adoption of Fintech by banks. Competitive pressure is one of the environmental factors that pose challenges to the adoption of Fintech by banks. The relationship between competition and technology adoption is researched. For example, Porter (2001) and Kowtha and Choon (2001) confirmed that the adoption of technology allows a firm to enjoy competitive advantage by reducing costs and improving their reaction to market changes.

RESEARCH METHODOLOGY

This study adopts a qualitative approach to assess the level of adoption of financial technologies (Fintech) by Nigerian commercial banks in order to understand the status of Fintech adoption by the banks. There is a dearth of information in the literature regarding the extent to which bank utilize Fintech to drive the delivery of banking services. A set of questionnaire was administered on the entire 20 commercial banks in Nigeria with the exclusion of Jaiz Bank Plc which is a non interest bearing bank. There are eight commercial banks with international authorization in Nigeria, ten with national authorization and two with regional authorization. The questionnaire elicited information on the extent of introducing Fintech products or services by the banks, sources of Fintech innovations and various Fintech innovation activities that the banks engage in. The constructs of Fintech innovation, Fintech innovation activities and financial performance are measured and proxied by various variables. For instance, Fintech innovation was measured by asking the respondents the extent to which their banks introduced/used Fintech innovation in the last three years, and the response was ranked on a 5-item Likert scale from 1 (very low extent) to 5 (very high extent). The same 5-item Likert scale was also applied to Fintech innovation activities which comprise the following: In-house R&D activities (IRD); Collaboration with external companies (CEC); Training of employees (TRA); Hardware technology acquisition (HTA) and Software technology acquisition (STA).

Furthermore, banks' financial performance was measured by the last financial year reported profit after tax of commercial banks as obtained in their income statement. A qualitative approach was adjudged suitable when the aim of a research is to attain a subterranean understanding of a topical issue when the nature of the issue is exploratory, evolving and there are few empirical articles on the topic (Akinwale, 2018b; Myers, 2009). The study also used correlation analysis to determine the relationship between Fintech innovation adoption and Fintech innovation activities. Furthermore regression analysis was utilised to establish the impact of Fintech innovation adoption on banks' financial performance. Primary and secondary data were used in this study for proper analysis. The primary data was collected between April and May, 2019. The response rate as at the period of this report was 70%.

RESULTS AND DISCUSSION

Analysis of Results

The survey conducted showed that 57% of the respondents from the commercial banks have international authorization, 43% of them have national authorization while none of the respondents has regional authorization as shown in Table 1. This showed that the respondents represent the commercial banks with both international and national authorization which is a good feedback upon which the analysis will be done. Enquiry about the sources of Fintech innovation was also made from the respondents, and majority (64%) of them claimed that they collaborate with other companies to develop their Fintech products/services; 21% opined that their banks wholly develop their Fintech products/services and 15% of them stated that FinTech was developed mainly by other companies.

Table 1: Nature of Commercial Bank with Authorization and Sources of Fintech Innovation

Banks' characteristics	% of firms
Nature of commercial bank with authorization	
Bank with international authorization	57
National authorization	43
Regional authorization	0
Total	100
Sources of Fintech innovation	
Mainly by the bank	21
The bank together with other companies	64
Mainly by other companies	15
Total	100

Table 2 highlighted the levels of Fintech adoption among the sampled banks in the last three years. Majority (43%) of the respondents claimed that their level of adoption of Fintech is at the "medium level", 29% of the respondents opined it to be at "high level", and 7% stated their level of adoption to be at a "very high level". More so, 21% believed their level of adoption to be "low" while none of them claimed that their level of adoption is at a "very low level". This clearly showed that the extent of adoption of Fintech by Nigerian commercial banks is still at the medium level. This is similar to the results obtained in the study conducted by Ernst and Young (2017).

Table 2: Levels of Fintech Adoption and Nature of Fintech in the Last Three Years

Description	Percentage
Levels of Fintech adoption in the last three years	
Very high	7
High	29
Medium	43
Low	21
Very low	0
Total	100
Nature of Fintech innovation in the last three years[*]	
Money transfer and payment (This includes mobile phone payment, payment via crypto currency, overseas remittances, Online digital-only banks without branches)	79
Insurance (This includes car insurance using telematics, Activity-based health insurance)	36
Savings and Investment (This includes Peer-to-peer platforms for high-interest investments, Online investment advice and investment management)	57
Borrowings (This includes Borrowing using peer-to-peer platforms, borrowing using online short-term loan providers)	22
Financial planning (online budgeting and financial planning tools)	29

[*] *denotes Multiple Response*

Table 2 further reveals the nature of Fintech introduced in the past three years. Seventy-nine percent of the respondents stated that their banks introduced "money transfer and payment" which includes mobile phone payment, payment via crypto currency, overseas remittances and online digital-only banks without branches. While 57% of them indicated that their banks introduced "savings and investment" which includes peer-to-peer platforms for high-interest investments, online investment advice and investment management, 36% of the respondents opined that their banks have introduced Fintech for "insurance services", 29% asserted that their banks used Fintech for "financial planning" in the last three years, and the smallest proportion (22%) of the respondents stated that their banks have introduced Fintech for "borrowing services" which include peer-to-peer platforms, and online short-term loan provision. It could be deduced from these results that the commercial banks sampled have engaged in some form of financial technology but the concentration has been on money transfer payments. Other forms of financial technologies that are now rampant in other emerging and developed economies such as peer to peer borrowing and investment platforms are still very limited among the Nigerian banks.

The relationship between the introduction of financial technology innovation (FTI) and Fintech innovation activities was examined using spearman correlation in Table 3. These Fintech innovation activities include in-house R&D activities (IRD), collaboration with external companies (CEC), training of employees (TRA), hardware technology acquisition (HTA) and software technology acquisition (STA). This was carried out to assess the linkages between these variables and financial technology innovation. The result revealed that all the variables representing FinTech innovation activities are positively related to Fintech innovation except training. This indicates that IRD, CEC, HTA and STA move in the same direction with financial technology innovation. That is, they all increase together and vice versa. Meanwhile, out of all these variables only software technology innovation and collaboration with external companies are both statistically significant at 5% level of significance in their relationship with financial technology innovation.

Table 3: Correlation Matrix between the Fintech Innovation Activities

No.	Variables	1	2	3	4	5	6
1	Fintech Innovation (FTI)	1	-	-	-	-	-
2	Inhouse R&D activities (IRD)	0.31	1	-	-	-	-
3	Training (TRA)	-0.21	0.11	1	-	-	-
4	Hardware Technology Acquisition (HTA)	0.37	0.25*	0.19	1	-	-
5	Software Technology Acquisition (STA)	0.51*	0.42*	0.24	0.37	1	-
6	Collaboration with External Companies (CEC)	0.46*	-0.13	0.31	0.23	0.38	1

* denotes significant at 5% level of significance

Furthermore, the impact of the adoption of Fintech innovation (FTI) on banks' financial performance was evaluated using multiple regressions. The financial performance is proxied by profit after tax (PAT) and this represents the dependent variable. The independent variables are FTI, STA and CEC. Table 4 showed that all the independent variables are positive with coefficients 0.05, 0.21 and 0.01 and their respective standard errors in the bracket for FTI, STA and CEC respectively. This signified that the three variables have positive impact on the banks' financial performance. However, FTI and STA are statistically significant at 5% level of significance, whereas CEC is not statistically significant.

Table 4: Multiple Linear Regression for the Impact of Fintech Innovation
Activities on Banks' Financial Performance

Dependent Variable: Financial performance (PAT)	
Explanatory Variables	**Coefficient (B)**
Fintech innovation (FTI)	0.05*(0.012)
Software Technology Acquisition (STA)	0.21* (0.04)
Collaboration with External Companies (CEC)	0.01 (0.13)
C	14.13
R^2	0.21

* denotes 5% level of Significance

The coefficient of determination R^2 is 0.21 which signified that the proportion of variation in the banks' financial performance that could be explained by these three variables is 21%. The value of R^2 is although relatively low but this is understandable as there are several other factors that explain the variation in the banks' financial performance that are not captured in this study.

The results of the spearman correlation in Table 4 indicate that it is important for the banks to continuously conduct in-house R&D, increase their spending in the acquisition of both hardware and software technologies and deepen their collaboration with external companies (mainly Fintech companies). All these are expected to improve their level of adoption, penetration and use of Fintech innovation towards the satisfaction of their clients. The negative relationship of training with Fintech innovation could be as a result of the present poor training level of the banks' employees on FinTech innovation. The banks should try as much as possible to also train their employees on the cutting-edge technologies required for the easier application of FinTech innovation. The result of Table 5 further buttressed the importance of the adoption of Fintech innovation as well as the application of software technology and external collaboration for the growth of the banks' profit.

The challenges and constraints facing banks in the introduction and use of Fintech innovation was also observed through multiple responses. Table 5 revealed that poor understanding/acceptance and distrust of Fintech innovation by the customers was perceived to be the topmost constraint by 93% of the respondents. This is followed by difficulty in finding reliable cooperation partners for Fintech innovation (79%), lack of adequate information on Fintech (71%), regulatory challenges (71%) and consumers' unwillingness to pay higher prices for better Fintech services (57%). Other constraints such as lack of qualified personnel (43%), lack of adequate finance for Fintech innovation in the bank (43%), and market being dominated by the big banks (36%) are perceived as less impacting constraints by the respondents. The results are similar to that of Grazel (2017), Busco *et al*. (2006) and Scott (2001). This clearly showed that sensitization will be required to expose the costumers to the benefits of Fintech, improve the banks' regulations on the part of the government to create a good system for the banks to adopt Fintech innovation, as well as training the banks' personnel to develop capabilities to be able to facilitate the efficient use of Fintech innovation.

Table 5: Challenges/constraints of Adoption of Fintech Innovation by Commercial Banks

Challenges*	Percentage
Poor understanding/ acceptance and distrust of Fintech innovation by customers	93
Difficulty in finding reliable cooperation partners for Fintech innovation	79
Lack of adequate information on Fintech	71
Regulatory challenges	71
Consumers unwillingness to pay higher prices for better Fintech	57
Lack of qualified personnel	43
Lack of adequate finance for Fintech innovation in the bank	43
Market is being dominated by the big banks	36

Multiple Responses

CONCLUSION

The participation of *Fintech companies* in the provision of banking services has been seen by banks as both a threat and opportunity. This makes banks across the world to integrate Fintech innovations into their businesses by acquiring, partnering or developing their own Fintech to improve their services and gain a competitive edge. Despite the fact that this practice is becoming very rampant in developed economies, little or none is known about this in the developing economies, especially in Sub-Saharan Africa. This study examines the level of the adoption of Fintech innovations by Nigerian banks. Data were collected using a structured questionnaire based on the literature reviewed and the findings of the study concludes that commercial banks in Nigeria have adopted some form of financial technology with particular concentration on money transfer payments. Other forms of technologies such as peer-to-peer borrowing and investment platforms are still very low among the banks. It is also the conclusion of this study that in-house R&D, increased expenditure on the acquisition of both software and hardware, and external collaboration are fundamental in improving the level of Fintech adoption of Nigerian banks. The study also concludes that the adoption of Fintech has a positive relationship with the financial performance of Nigerian banks. Further research is recommended to examine the extent of awareness of Fintech innovations by Nigerian banks' customers.

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