Financial Technologies and Financial Inclusion in Emerging Economies: Perspectives from Nigeria

ABSTRACT: *This paper examined the interplay between financial technologies and financial inclusion in emerging economies especially from the Nigerian perspective. The study adopted the exploratory research design involving extensive review of related published materials including statistics obtained from reputable sources such as the World Bank, the Enhancing Financial Inclusion Surveys and the Global Findex reports. The study found that while the deployment of financial technologies has aided the financial inclusion drive in Nigeria, progress is still being hampered by challenges relating to poor system interoperability, socio-cultural induced gender sensitivities, concerns of data privacy breaches and over serving of cities by Fintechs to the detriment of priority rural areas. The study therefore recommended that regulatory authorities should provide clear policy frameworks that address issues of gender sensitivities, breach of data privacy and encourage a redirection of fintech activities to priority rural areas for greater impact on the financial inclusion drive. Also, efforts should be made to improve system interoperability and linkages between the conventional banks and fintech players to mitigate the challenges of frequent downtimes and service glitches which heightens trust deficiency.*

Keywords: *Financial Technologies, Financial Inclusion, Fintech Investments, Financial Innovation, Emerging Economies, Nigeria*

JEL Classification*: C33, C8, D14, G20, G21, O40*

1. INTRODUCTION

Globally, financial exclusion has been a major challenge confronting nation states, especially those that are underdeveloped or developing. Financial exclusion in this case refers to the degree or extent at which eligible persons are financially disadvantaged or unable to access finance and financial services in a fair, cost effective and equitable manner (Hannig and Jansen 2010; Mohan, 2018; Usman, 2020; Ozili, 2021). According to the World Bank Global Findex Database 2021 report, about 24% of the world's population remains financially excluded while the position of developing countries within the same period is slightly worse as it stood at 29%. Similarly, the Enhancing Financial Innovation and Access (EFInA) 2020 report indicated that specifically for Nigeria, about 38 million adults or 36% of the population remained financially excluded with attendant consequences for poverty reduction and even economic development. This has been exacerbated by the issues of cultural inhibitions, market imperfections, logistics challenges and cumbersome account on-boarding process in traditional institutions (Sarpong and Nketiah-Amponsah, 2022).

This worrisome scenario further underscores why efforts must be renewed to improve the scale of financial inclusion and hence reduction of the levels of financial exclusion. Financial inclusion is the sum of measures taken by governments and/or its agencies to facilitate opportunities to access financial

services and products including but not limited to insurance products, remittance schemes, bank accounts, transfers, credit facilities (Mago and Chitokwindo, 2014; Ene, Abba and Fatokun, 2019; Popescu, 2019; Isukul and Tantua, 2021). This theme of financial inclusion features prominently in at least ten (10) of the seventeen (17) universally accepted Sustainable Development Goals (SDGs) enunciated by the United Nations (Ajekwe, 2020). Miao and Juanjuan (2018) contend that apart from aligning with sustainable development, all financial inclusion initiatives must also exhibit the features of diversity in service offerings, cost effectiveness and been amenable to disruptive financial innovation. For financial inclusion objectives to be attained at the desired levels and speed, a great deal of disruptive financial innovations is therefore required. This is because disruptive innovation challenges entrenched traditional banking patterns fraught with entry and service barriers and replaces same with the benefits of ease of accessibility, simplicity and affordability thus giving rise to the deployment of financial technologies (Kjellman, Björkroth, Kangas, Tainio, and Westerholm, 2019).

Financial technologies (commonly abbreviated as Fintechs) are a combination of new disruptive technology applications that facilitate the rendition and supply of typical financial services using online medium (Kagan, 2019; Li and Xu, 2021). The entrance of this innovative disruptive technology into the traditional financial services space has given it a face lift while also attracting a mix of threats and opportunities for the traditional financial services operators (Ogunode, Akintoye, Ajayi and Joshua 2022; Kyari and Adewale, 2020). It has essentially made possible the consummation of banking transactions outside the brick-and-mortar premises of a conventional financial services institution using various electronic media (Usman, 2020). Li and Xu (2021) affirm that the key electronic media involved include biometric technology, blockchain and cloud computing, artificial intelligence, and exchange of APIs (Application Programming Interfaces), smart phones, automated teller machines, big data, point-of-sales systems and the internet. Notwithstanding the benefits associated with the efforts of Fintechs, extending their footprint and securing significant mileage is not possible without having in place some form of collaborative arrangement with the conventional financial services players (Manthorpe, 2017; Haddad and Hornuf, 2019).

On a worldwide scale, the use and deployment of Fintechs have been recognized as one of the most veritable tools to address the challenge of financial inclusion (Grazel, 2016; Loubere, 2017; Miau and Yang, 2018; Kanga, Oughton, Harris and Murinde, 2021; Tian and Kling, 2022). Nevertheless, progress in terms of adoption has been slow relative to the upsurge in population and economic growth, especially for developing economies. For example, due to the difficulties associated with defective planning and poor infrastructural development, rural urban migration of individuals in developing economies have not been able to stem the tide of growth in rural population where the need for financial inclusion is greatest. This position is reinforced by the studies of Cicchiello, Kuzemikhasragh, Monferra and Giron (2021) which documented that growth in rural population of forty-two (42) sampled Asian and African countries within a study period of nineteen (19) years – 2000 to 2019 far outstrips the rate of impact of financial technology usage and consequently financial inclusion. Furthermore, according to Sarpong and Nketiah-Amponsah (2022), as at December 2018, developing economies in the African continent still lagged behind their peers in other geographical territories in experiencing commensurate economic growth due to poverty, income inequalities and uneven economic participation.

Consequently, in this context, this study is carried out to extend the frontiers of knowledge by contributing to available extant literature on the part that financial technologies play in driving financial inclusion especially from the perspectives of Nigeria as an emerging economy. The rest of the study was put together in this manner: In section 2, a review of extant literature was presented, methodology in

section 3, while in sections 4 and 5, the study considered the discussion of findings, conclusion, and recommendation of the work.

2. LITERATURE REVIEW

2.1 The Concept of Financial Inclusion

Financial inclusion has been deemed an elixir for even economic growth and development, reduction in income inequalities and the boosting of shared economic prosperity (Chibba, 2009; Cull, Erhbeck and Holle, 2014; Ouma, Odongo and Were, 2017; Popescu,2019). Chakraborty and Mukherjee (2012) posit that it is a process that involves making banking and its associated products available to the have-nots. To achieve this, efforts must be made to ensure supporting technology and regulatory policies are in place (Mogaji, 2020). Alternatively referred to as inclusive finance, its focus is the extension of formal financial services and products to individuals and businesses that are largely in the informal sector or outside the net of conventional banking. These include the rural poor, low-income earners, small scale businesses and other allied economic agents. Affordability and accessibility are at the core of financial inclusion (Usman, 2020; Nguyen, 2021). Simply put therefore, financial inclusion is making financial services and products available on an affordable and accessible basis to all and sundry irrespective of social class, income levels or any other extenuating factor.

Through financial inclusion, the financially disadvantaged can secure buffers against socio-economic vagaries and shocks while also insulating their consumption (Wahiba and Weriemmi, 2014; Isukul, Agbugba and Chizea, 2019). Furthermore, through properly administered financial inclusion measures, benefits of improvements in quality of life and economic prosperity have been documented in a number of developing countries (Adeola and Evans, 2017; Dubus and Hove, 2017; Bayar and Gavriletea, 2018; Uronu and Ndiege, 2018; Eton, Uwonda, Mwosi, Barigye, and Ogwel, 2019). It also provides a benchmark for facilitating financial stability and scaling up of loanable funds needed for economic empowerment of women, youths, small and medium scale enterprises (Demirguc-Kunt and Klapper, 2012; Hendriks 2019). When properly done, it can improve financial planning culture for individuals, households, and businesses especially at the micro-levels (Babajide, Okunlola, Lawal, Akinjare and Adedoyin, 2021).

Onaolapo (2015) assert that accomplishing the objective of financial inclusion begins first with proper identification of the primary needs of the financially disadvantaged following which a hierarchy is designed with tailor made solutions for each category of need. This hierarchy of financial inclusion needs commences with the opening of bank accounts using non-conventional means such as e-wallets, smart phones etc. and thereafter progress into vistas of opportunities for other allied services such as remittances, savings, loans and insurance products depending on the appetite and extent of financial literacy of the individuals. Apart from the pace of account opening, various scholars and development agencies have documented other indices to measure financial inclusion particularly for the less developed economies. The Alliance for Financial Inclusion (AFI) and the G-20 Global Partnership for Financial Inclusion (GPFI) offers two dimensions as criteria for measurement: Access indexed as the number of access points or branches per 10,000 adult and Usage reflected in the ratio of adults owning at least one type of deposit account/Number of depositors per 1,000 adults (AFI, 2011; IFC,2011). The IMF and the World Bank via its Global Findex report of 2017 identifies mobile subscriptions per 100 adults, proportion of adults utilizing the internet/mobile phones for payment and remittance services as financial inclusion indicators for developing economies (Khera, Ng, Ogawa and Sahay, 2021).

Ajike (2017) carried out its studies using the number of Automated Teller Machines (ATMs) per 100,000 adults, ATMs per 1,000km and Bank branches per 100,000 adults as pivots for financial inclusion. This

view is corroborated by the positions of Ahamed and Mallick (2019); Desire, Chrysost and Ndoya (2020) which dimensioned financial inclusion from the angles of access (possession of bank card), penetration (ATMs and bank branch locations) and usage (savings, loans, and insurance products). Similarly, Girón, Kazemikhasragh, Cicchiello, Panetti (2021) pinpointed ownership of official bank accounts, access to regular credit and the degree of informal savings prevalent as measures of financial inclusion. However, they posited that growth in these channels is hindered by trust and poor documentation issues as well as distance to the nearest financial institution. Irrespective of the measuring yardsticks selected, for Africa and most developing economies, it has been found that the choice of indices to use is heavily influenced by factors such as age, gender, household size, socio-cultural characteristics, education level and internet access (Hannig and Jansen, 2010; Mzobe, 2015; Olaniyi and Adeoye, 2016; Zhang and Posso, 2019; Atakli and Agbenyo, 2020). The researchers found that despite increases in levels and depth of financial literacy, these factors often significantly influence the decision-making efforts of the vulnerable and financially disadvantaged. Thus, conscious efforts must continue to be made to address these moderating variables to sustain the incremental gains achieved with renewed financial inclusion initiatives.

From Figure 1 below, using the most common measuring yardstick of financial inclusion (account ownership), the latest World Bank Findex Report (2021) indicated that within the last ten (10) years culminating in 2021, account ownership significantly grew from 51% to 76% of global adult population. However, when compared with the performance of nation states in Sub Saharan Africa (SSA), the position is significantly lower at 51% of its eligible adult population. This suggests that while some measures of progress have been achieved using alternative channels such as mobile devices, the growth is still hampered by issues around internet connectivity and access, poor broad band penetration and cultural inhibitions.

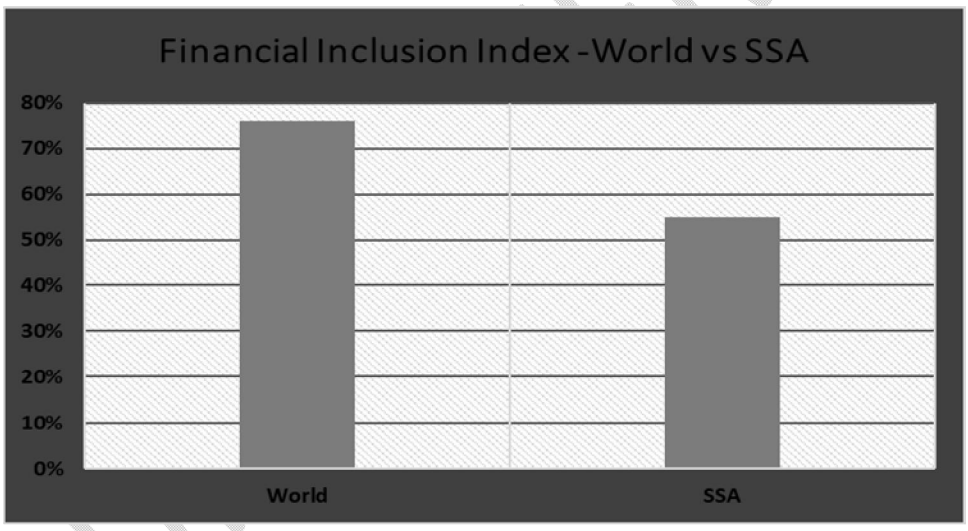


Figure 1: Financial Inclusion Status (World Vs SSA)

Source: *Adapted from World Bank Group Findex Report (2021)*

Figure 2 shows a comparative analysis of the financial inclusion status of three (3) key African countries – Kenya, South Africa and Ghana compared with Nigeria within the same time horizon of 10 years terminating in 2021. The results show that while these countries witnessed significant upside in their growth trajectory: Kenya -87%; South Africa – 59%; Ghana – 132%, Nigeria experienced what is at best a muted progress which stood at 53%. This suggests that while financial inclusion initiatives such as the M-Pesa in Kenya, Mbansi scheme in South Africa, Cash-Lite initiative in Ghana has witnessed

noteworthy impact, that of the Nigerian authorities championed by its National Financial Inclusion Strategy has been less than successful for various factors. It is the intention of this paper therefore to interrogate these factors and proffer mitigants for addressing them accordingly.

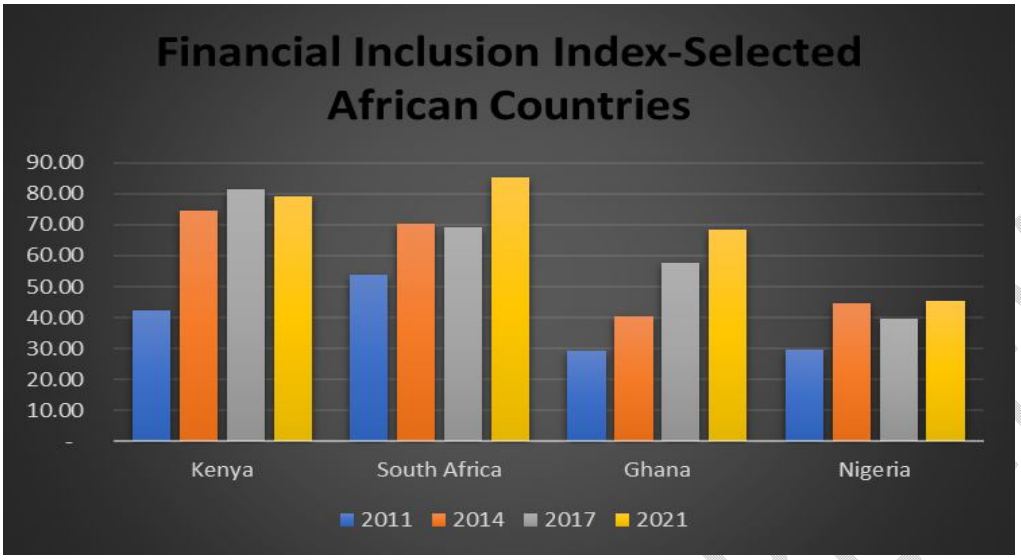


Figure 2: Financial Inclusion Status (Selected African Countries Vs Nigeria)

Source: *Adapted from World Bank Group Findex Report (2021)*

2.2 The Concept of Financial Technologies

Financial technologies as a concept and practice began to gain serious worldwide traction following the outbreak of the global financial crisis in 2008 (Anyfantaki, 2016; Azarenkova, Shkodina, Samorodov, Babenko and Onishchenko, 2018; Frost, 2020). Financial technologies (Fintechs) are the modern tools for facilitating financial inclusion and it has been defined by various scholars from different dimensions. Schueffel (2016) considers it as a stand-alone industry on its own which applies technology to the enhancement of financial services. Ogbuji, Ologundudu and Oluyomi (2020) defined it as a set of new technologies designed and deployed to disrupt traditional ways in which financial services are rendered. This disruption occurs because Fintechs thrive on innovation. Innovation in this sense helps to optimize customer experience and consequently promote organizational efficiency (Miao and Juanjuan, 2018). Beck (2020) argues that for innovative practices and processes to qualify as having been carried out by Fintechs they must be recent and of a financial nature. This is because when technology is old, it loses its ability to challenge traditional banking norms and practices.

According to Khera et al, (2021), Fintechs are technology driven innovations that birth new business processes, products and models which have material impact on the way and manner financial services are rendered to individuals, households, and businesses. Karsh and Abufara (2020) also view it as a financial solution that is digitalized and offered to vulnerable groups and businesses to meet their financial needs. *For the purpose of this study therefore, it is thus essentially the rendition of financial products and services using various alternative electronic channels in an affordable, efficient, and accessible way*. Examples of financial technologies commonly deployed in the financial services sector in Africa include mobile apps, Unstructured Supplementary Services Data (USSD), ATMs, POS (Mogaji et al, 2020). Fintechs are precursors of the banking of the future and have arisen to challenge conventional banks and their natural financial intermediation process (Broby, 2021). As more Fintech players enter the fray, the

market has witnessed innovations in product design, pricing, and marketing techniques to improve their depth and reach (Popescu, 2019). One factor that has made this possible is the fact that they are able to reduce their operational costs by latching on to the existing financial infrastructure of collaborating conventional banks (Kyari and Akinwale, 2020).

As they evolve, the Fintech landscape is currently made up of start-ups, established players, technology designers and developers/enablers, collaborating conventional banks and the supervisory regulatory agencies (Lee and Shin, 2018; Ogbuji et al 2020). The rapid growth of Fintechs have been fueled in part by the regulatory burdens placed on traditional banks, frequent injection of investible funds by venture capitalists, increase in technologically inclined talents and emerging collaborative opportunities with the conventional finance institutions (Kavuri, Milne, 2019). This influence is mainly felt via the application of big data, the internet, artificial intelligence, blockchain cloud computing and machine learning which has been responsible for driving peer-to-peer lending, peer-to-peer payment facilities and crowdfunding activities that has transformed the lot of several vulnerable groups and financially disadvantaged individuals (Wayne, Soetan, Bajepade and Mogaji, 2020; Kurmanova, Kurmanova, Nurdavliatova, 2020; Chang, Liang and Wang, 2021).

In terms of increasing importance, Fintechs have continued to attract significant investments particularly into markets with enormous potential, especially in emerging economies. For example, between 2017 and 2020, the African continent which harbors at least 33 out of the 47 weakest economies have attracted over $2.8bn in seed investments (Kasera, 2021). Furthermore, the continent's rapidly growing population has helped to make it a choice investment decision. According to African Investment Report put together by Briter Bridges (2021), in 2021 alone, at least a minimum sum of $3bn capital injection into African-based Fintechs took place which accounted for over 62% of total foreign direct investment received into the continent. As shown in Figure 3, this amounts to a 125% rise over the preceding year suggesting increasing appetite of venture capitalists as it relates to the African market. Within this market context, about 54% of all scaled Fintech entities are found in South Africa, Nigeria and Kenya alone.

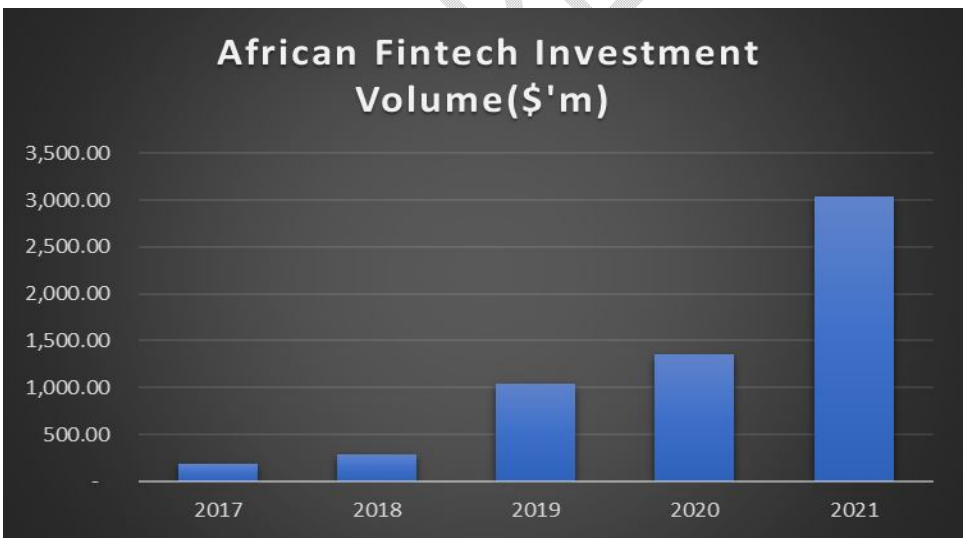


Figure 3: Fintech Investment Growth Trajectory in Africa

Source: *Adapted from Catalyst Funds and Bridges Report (2021)*

Additionally, given that the African continent is currently the largest user of mobile money transfer functionalities accounting for nearly 50% of global uptake, the window of opportunity to further extend

the depth and reach of financial technologies in Africa is huge (Holtz, 2021). As of December 2020, the associated transaction value for this volume has already topped $490bn (GSMA, 2021).

2.3 Theoretical Framework

This study is grounded on two theories of financial inclusion namely: the theory of access opportunity frontier and the theory of innovation. The theory of access opportunity frontier was propounded by Beck and De La Torre (2006) as an extension of the economic theory of demand and supply. The theorists postulated that access to financial products and services is a function of the associated costs, extent of product differentiation and diversification and the extent to which the infrastructure of banks are concentrated around a particular geographical location. It thus emphasizes the centrality of costs as a determinant for product offerings (Ekong and Ekong 2022; Batila Ngouala Kombo, 2021). Supporters of the theory have argued that unless entry barriers such as high costs of account maintenance, geographically dispersed location of bank branches are effectively addressed, the goal of bringing on-board the financially excluded will not be accomplished (Claessens, 2006; Beck and Deirguc-Kunt, 2008; Guerineau and Jacolin, 2014). The theory has been criticized by Gamji (2009) who argued that the vulnerable and financially disadvantaged may still suffer problems of sustained access where they manifest financial indiscipline with credit advanced to them. Nevertheless, this theory is considered germane for this study because accessibility to financial services is fundamental to achieving the goal of financial inclusion.

The theory of innovation as it relates to financial inclusion on the other hand was championed by Schumpter (1983). The focal point of the theory is that innovation is very key for the sustenance of any business venture and that economic change is a direct offshoot of innovation. It further asserts that there is a direct correlation between innovation and profits made by entrepreneurs such as Fintech operators. Thus, the greater the innovation, the higher the profit taking and vice versa. Miller (1991) affirms that the need for financial innovation is accentuated by the observed increasing volatility of the financial markets. Tufano (2003) added that the opportunity to lower set up costs and associated costs of borrowing has also aided the need for financial innovation. Furthermore, Hagedoorn (1996) opined that entrepreneurship cannot be divorced from financial innovation. This implies that for a Fintech operator to positively influence financial inclusion through innovation, it must be willing to demonstrate its entrepreneurial capabilities. Moldaschi (2010) has criticized the very notion of innovation theory on the grounds that it cannot stand on its own without the support of a supplementary theory. Additionally, it has been criticized for ignoring other elements such as management skills which influence the decision-making abilities and successes of the entrepreneur.

The theory is however considered crucial to this study because it recognizes that economic change revolves mainly around innovation. This suggests therefore that as governments and the general society desire a change in the economic status of the vulnerable and financially disadvantaged, efforts must therefore be made to encourage change agents such as Fintech players to continually innovate to address the challenge of financial exclusion in a more wholistic manner.

3. METHODOLOGY

The methodology adopted for this review was the exploratory research approach involving extensive review of recent periodicals, empirical and analytical studies, policy discussion and working papers as well as other documented materials found to be pertinent to the study. This review approach involved four distinct phases namely: identification, screening, eligibility, and inclusion phases. In the identification phase, a careful review of major academic databases housing deposits of international peer reviewed literature was conducted with searchlight beamed on the study's identified keywords (financial

technology, financial inclusion, emerging economies). In this instance, the primary academic database consulted were the Web of Science, Scopus, Emerald, Google Scholar, Directory of Access Journal (DOAJ) and Index Copernicus respectively. In view of the focus to stick only to relevant and recent literature, the time horizon selected was twelve years between 2010 and 2022 respectively. This produced 1,728 records. In the screening phase, the identified 1,728 academic records were further pruned down to 422 records using scope of study, title of paper, abstract and keyword as inclusion criteria to enable better focus and relatability. In the eligibility phase, full-text scanning, and deep dive of the 422 academic records was carried out with particular reference to the degree of peer review conducted and this resulted in the exclusion of 324 academic papers while 98 documents remained. The last phase subsequently produced a final selection of 26 papers which fully aligned with the research objective and therefore formed the fulcrum of the study.

3.1 Financial Technologies and Financial Inclusion – Perspectives from Other Emerging Economies

This section reviews perspectives from similar emerging economies on the state of play with respect to the nexus between financial technologies and financial inclusion with a view to eliciting useful lessons.

Using data obtained from 62 emerging economies drawn largely from Europe, Central Asia, Sub-Saharan Africa and the Caribbeans, the studies of Rizman and Bruneau (2019) demonstrated that microfinance institutions operating as FinTech players in the sampled countries positively impacted their financial inclusion drive which culminated in accelerating economic growth while also decreasing income inequalities. However, they noted that this performance can only be sustained via the deployment of more recent information and communication technologies (ICT) tools. This position is reinforced by the works of Sarpong and Nketiah-Amponsah (2022) who posit that proper use of innovative ICT tools will produce discernible effect on inclusive economic growth. However, they recommended a moderation of applicable transaction related fees and charges as a medium to speed up levels of financial inclusion.

In Zimbabwe, Abel, Mutandwa and Le Roux (2018) found that poor internet connectivity remained a major challenge preventing the use of Fintechs and other governmental strategies such as financial literacy campaigns from significantly improving their financial inclusion numbers. These views are reechoed in the studies focused on Iraq (Khalaf and Ali, 2017) and Egypt (Hussein, 2020) respectively. Similarly, for India, according to Ghosh and Ghosh (2014), leveraging of technology to facilitate financial inclusion is being hampered by the level of education and awareness of the financially disadvantaged. Thus, they opined that there is the need for concerted efforts at improving financial literacy levels. The studies of Ghosh and Bhattacharya (2019) which focused on Bangladesh demonstrated that gender disparities in financial inclusion can be overcome through the use of tailor-made financial technology solutions. This implies that the more innovative and attractive Fintech products are, the higher the likelihood of being subscribed to by the financially excluded. In the Middle East and North Africa (MENA) region, Pearce (2011) found that relative to other countries in the Sub-Saharan region, countries within the MENA geographical axis lagged significantly in financial inclusion with less than 25% of adults owning either a loan or deposit account. To redress the deficiency, a host of remedial policy actions were taken, the best of which was the release of government social security benefits to the vulnerable using the e-wallets system. This practice has since gained traction in other regions.

In Southeast Asia, Al-Mudimigh and Anshari (2020) noted that the preponderance of internet users allied with Fintech players significantly aided improvements in the rate at which the financially excluded were brought into the formal financial setting. The study also found that this was achieved largely due to the use of e-wallets and smartphones that bypassed existing structural and infrastructural barriers to reach the poor and vulnerable groups such as rural women. In the same vein, the widespread usage and availability

of mobile phones also bypassed typical infrastructural barriers to facilitate financial inclusion in some selected East and Southern African countries (Ouma et al, 2017; Chinoda and Akande, 2019). For Georgia, the studies of Silagadze (2021) showed that the use of practical interfaces and innovative Fintech products particularly encouraged more women to be financially included and independent. Relative to their male counterparts, as at 2017, the study found that more women (64%) embraced fintech products. The study also showed that similar patterns were observed in Armenia and Azerbaijan respectively. In Palestine, Wang and Shihadeh (2015) observed that the level of financial inclusion improved after the country joined the Alliance for Financial Inclusion (AFI) in addition to improvements in national financial infrastructure while in India, the enactment of regulations which encouraged the incubation and growth of Fintechs significantly impacted on their financial inclusion numbers (Dua, Sahay and Deol, 2019; Goswami, Sharma and Chouhan, 2022).

Overall, from the reviewed literature it would seem that while different approaches have been adopted by the different emerging economies, there is some commonality around the place and importance of financial literacy, innovativeness in Fintech product offerings, ease of access options, central government's use of e-wallets system to deliver stimulus packages and gender sensitivities. Furthermore, in terms of transaction profile to accomplish the objective of financial inclusion, most of these revolve around personal/petty loans, payments, transfers/remittances, savings, and insurance. This is as depicted in the following figure.

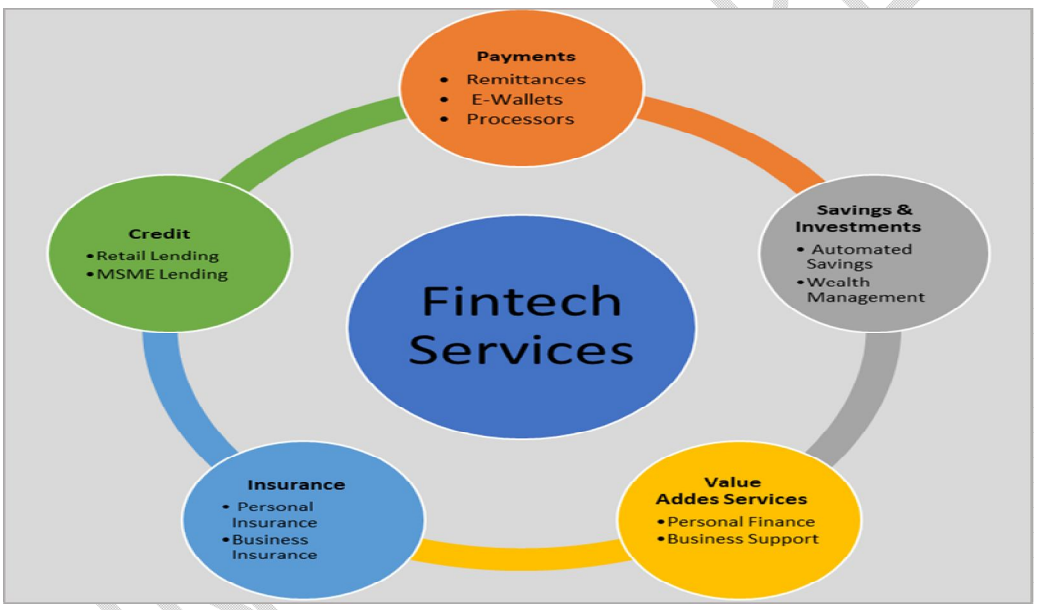


Figure 4: Broad Categories of Fintech Products and Services in Emerging Economies

Source: *Adapted from McKinsey & Company (2020)*

The majority of the Fintech products and services have, however, been focused on payments and lending. According to Murthy (2019), collectively they account for at least 57% of all Fintech service offerings in emerging economies. This is because these two segments remain the major pain points for individuals and SMEs in accessing traditional banking services.

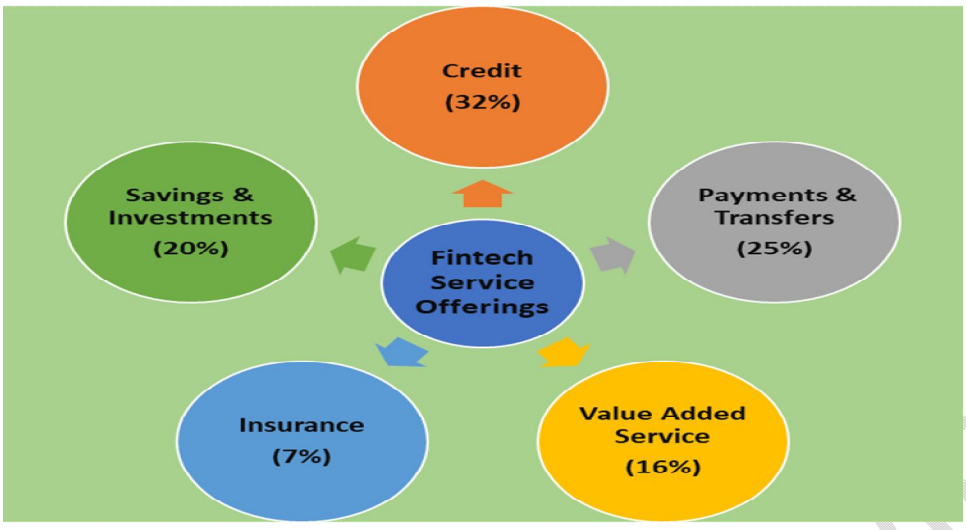


Figure 5: Fintech Service Offerings Split

Source: *Adapted from Murthy (2019)*

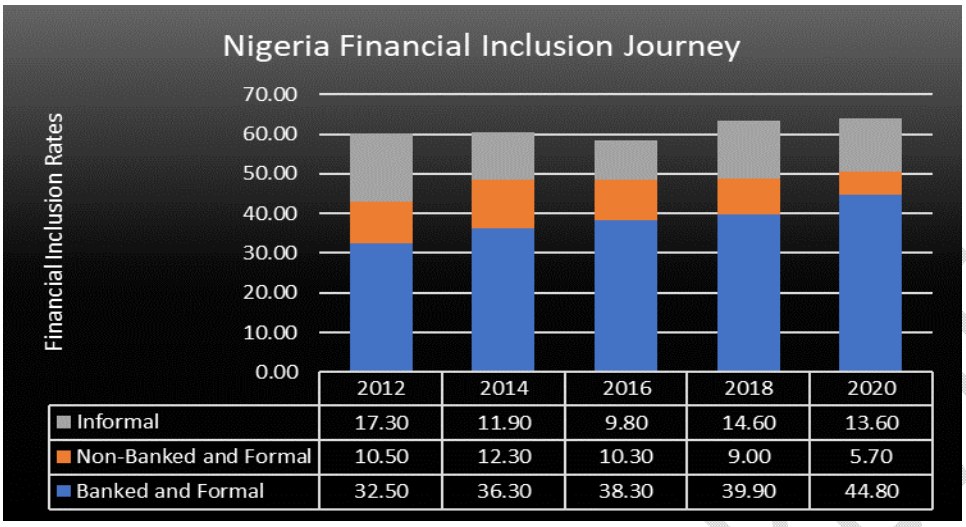
Furthermore, according to the International Monetary Fund (IMF), emerging economies account for 85% of the world's population with nearly 90% of these individuals aged under 30. These economies also account for about 60% of global GDP thus remaining a fertile ground for increased Fintech future investment and economic growth.

3.2 Financial Technologies and Financial Inclusion – The Nigerian Experience

The financial inclusion journey in Nigeria has been largely regulatory induced. Between 1977 and 2012, a myriad of policy initiatives aimed at fostering financial inclusion have been formulated. These include the rural banking policy enunciated by the monetary authorities in 1977 aimed at compelling banks to open and operate outlets in rural areas and the establishment of the Peoples Bank and community Banks respectively targeted at the poor and downtrodden in the Nigerian society. However, the measures did not achieve much success due to haphazard implementation, bureaucratic bottlenecks, poor inter agency collaborations and defective regulatory oversight (CBN, 2018). This therefore provided fulcrum for the advent of National Financial Inclusion Strategy (NFIS) of 2012 and its subsequent revisions of 2018 of which fintech is a cornerstone. Key fintech related measures taken since implementation of the Inclusion Strategy commenced included the introduction of a national electronic payment switch to facilitate intrabank non-cash transactions, introduction of cashless payment channels and regulatory sandbox to facilitate launch of new products as well as expansion of the agency banking network via the licensing of several mobile money agents (MMOs).

Even though the stated principal objective of the NFIS, 2012 as amended in 2018 was the attainment of 80% financial inclusion rate by 2020 (70% and 10% in formal and informal settings respectively), available statistics as demonstrated in Figure 6 below show that this was not achieved. While some progress has been made in the rate of growth in terms of formal financial inclusion (43% in 2012 to 50.5% in 2020), the proportion that can be directly attributable to the Fintech providers outside the conventional banks has witnessed a reverse movement (10.5% in 2012 to 5.7% in 2020). This suggests that more still needs to be done in terms of funding, regulatory support and creating the right enabling environment to ensure better participation of fintech players in supporting the financial inclusion objective. On the positive front however, the goal of 10% or less as contribution of the informal sector to

financial inclusion has almost been accomplished implying that more eligible adults are subscribing to the use of formal financial services today than ever before (decline from 17.3% in 2012 to 13.6% in 2020). Total level of financial inclusion therefore stands at 64.1% implying that at least 1 out of every eligible adult remains financially excluded as of 2020.



	2012	2014	2016	2018	2020
Informal	17.30	11.90	9.80	14.60	13.60
Non-Banked and Formal	10.50	12.30	10.30	9.00	5.70
Banked and Formal	32.50	36.30	38.30	39.90	44.80

Figure 6: Nigeria Financial Inclusion Growth Trajectory

Source: *EFInA Access to Financial Services in Nigeria Surveys (2012,2014,2016,2018, 2020)*

In terms of geographical distribution, available statistics indicate that the Southwest with better levels of financial literacy and cosmopolitan approach reported the least rate of financial exclusion (17%) when compared to the Northeast and Northwest regions whose exclusion rates stood at 50% and 68% respectively thus underscoring the need why efforts must be redoubled in these territories notwithstanding the religious constraints and gender sensitivities prevalent therein.

The high level of overall financial exclusion (36% of eligible adults) has motivated a steady rise in the number of and activities of fintechs with Nigeria topping the African charts and having at least five out of the seven unicorns on the continent -Flutterwave, Interswitch, Andela, Opay and Jumia (Lewis, 2021; Adepetun, 2022). These unicorns alongside their downlines have taken advantage of the country's increasing mobile penetration to significantly drive mobile money transfers/payments business. Figure 7 below demonstrates the growth pattern of mobile money relative to other Fintech channels such as Internet (Web), ATMs and POS. However, in terms of depth and reach, we note that many of the activities of the Fintechs have tended to concentrate mainly in the cities and urban areas at the expense of the rural areas. This therefore implies that more need to be done both from the regulatory and implementation standpoint to address this challenge of lopsidedness.

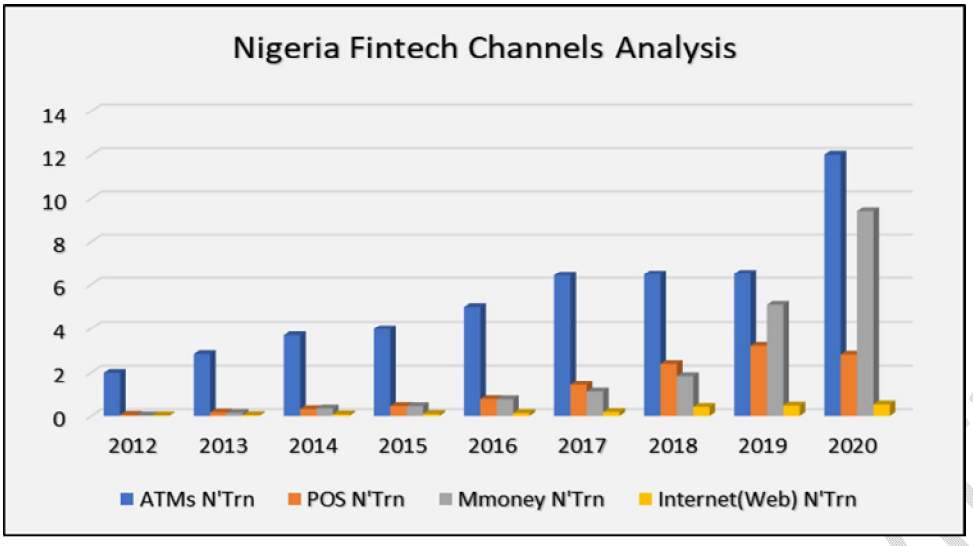


Figure 7: Nigeria Fintech Channels Performance Chart

Source: *Central Bank of Nigeria E-Payment Industry Statistics (2021)*

The above chart shows that at the outset of the release of the first Financial Inclusion Strategy in 2012, total contribution of Fintech(E-Channels) stood at N2.09 trillion out of which mobile money accounted for a paltry 1.43%. However, following the revision of the Strategy in 2018 and licensing of new mobile money players, the value of mobile money transactions grew significantly to N5.09 trillion and N9.43 trillion in 2019 (33%) and 2020 (35%) respectively. It is important to note that the 2020 data from the monetary authorities was as of August 2020 implying that the wallet share is likely to further increase when the full year position is subsequently made available. This therefore underscores the need to continue to develop this subsector as a veritable avenue in pushing the financial inclusion drive. Other Fintech channels such as ATMs and POS continue to demonstrate significant growth on a year-on-year basis with the exception being the web (internet) channel whose poor showing maybe attributable to concerns around data safety and poor internet connectivity.

Despite the aforementioned modest progress, the Nigerian financial inclusion journey is bedeviled by a number of challenges which has tended to blight the sustained use of financial technologies. One such challenge is the inability to grow savings and term deposits due to negative real interest rate orchestrated by double digit inflation prevalent in the economy (Mikhalov, 2020; Fries, 2021). Another observed challenge is the multiplicity of identity management systems which are not linked thus creating bureaucratic bottlenecks. This is particularly concerning because the existence of a generally accepted unique identifier platform is a sine qua non requirement for facilitating fintech induced growth in financial inclusion, hence the recent introduction of the Bank Verification Number (BVN) scheme (Esoimeme, 2015; Omisakin, 2021). Furthermore, socio-cultural inhibitions having roots in religious fundamentalism in northern Nigeria has contributed to the slow progress in the use of financial technologies (EFInA, 2021).

4. RESULTS AND DISCUSSION

It can be observed from the review of extant literature that the adoption and deployment of financial technologies contributes to the drive for financial inclusion in emerging economies albeit in varying degrees. The study has shown that for the impact of financial technologies on financial inclusion to be better felt, there is the need to recognize gender sensitivities and norms in culture sensitive areas such as

the Northwestern part of Nigeria where financial exclusion rate is as high as 68% (EFinA, 2021). For example, in such areas rural women have been found to be more likely to subscribe to Fintech services such as mobile money and point-of-sales manned by fellow women than their male counterparts. The study also indicated that mobile money deployment and usage has aided progress of financial inclusion efforts in Nigeria by over 313% as evidenced in increased traffic of mobile money transfers from N0.03Trillion to N9.43 trillion between 2012 and 2020 (CBN, 2021). This is in alignment with similar findings from other West African countries (Ahmad, Green and Jiang, 2020; Oumarou and Celestin 2021).

The study also pinpointed the modest efforts that the use of Internet (Web), ATMs and POS has made in pushing the frontiers of financial inclusion in Nigeria. However, there is the need to strengthen financial literacy and consumer protection activities to address the trust deficiency that is preventing optimum results from being realized from these channels (Wayne et al, 2020). System interoperability and linkages between the conventional banks and fintech players must also be improved upon to address the common challenges of frequent downtimes and service glitches. Similarly, concerns around consumer protection, data harvesting, security and breach of data privacy need to be frontally addressed as part of efforts to reduce trust deficiencies. This is particularly prevalent in the activities of Fintech online lending platforms who in the pursuit of purported recoveries of loans resort to less than savory methods involving breach of data privacy.

The study also observed a preponderance of new Fintech startups in Nigeria within the last ten (10) years in response to the vista of opportunity that the country's poor rate of financial inclusion presented. However, it was noted that activities of these Fintechs still tended to be concentrated in the cities and urban areas rather than the rural areas where the need is greatest. We note that the situation is not helped by the absence of a clear regulatory framework to guide operational activities and/or to stimulate a redirection of efforts to these priority areas in the quest to answer the financial exclusion question.

5. CONCLUSION AND STUDY IMPLICATIONS

There is a global consensus that financial inclusion is an elixir for even economic growth, reduction in income inequalities and the boosting of shared economic prosperity. Having considered various experiences from the emerging economies, it is very pertinent to note that there is no one size fits all financial technologies recipe for growing financial inclusion in the affected nation states. Rather, each nation state must develop uniquely amenable financial technologies that are best suited to them which takes into consideration their peculiar socio-cultural and economic situations. With Nigeria's ever-growing population estimated to be 216m out of which the rural segment account for 48% as at July 2022 (United Nations, 2022) and widespread adoption of mobile phones, the need to optimize usage of Fintech products and services to bridge the financial inclusion gap has indeed become very apparent. This study has therefore sought to highlight the key fintech products and services and what needs to be done to optimize their usage with a view to aiding the financial inclusion journey in Nigeria. The study found that found that while the deployment of financial technologies has aided the financial inclusion drive in Nigeria, progress is still being hampered by challenges relating to poor system interoperability, socio-cultural induced gender sensitivities, concerns of data privacy breaches and over serving of cities by FinTech's to the detriment of priority rural areas.

Based on the findings of this study, it is therefore recommended that regulatory authorities should provide clear policy frameworks that address issues of gender sensitivities, breach of data privacy and encourage a redirection of fintech activities to priority rural areas for greater impact on the financial inclusion drive. Secondly, efforts should be made to improve system interoperability and linkages between the

conventional banks and fintech players to mitigate the challenges of frequent downtimes and service glitches which heightens trust deficiency.

This study has presented both theoretical and practical implications for policy makers, regulators, practitioners, technology enthusiasts and academic researchers especially from the emerging economy perspective. Policy makers and regulators will find the outcome of this study important in that it highlighted areas of deficiencies in policy frameworks that need to be addressed to improve on the financial inclusion quest. The study is however limited to the extent that it focuses principally on financial technologies largely prevalent in emerging economies settings. Other forms of technology such as blockchain have not been actively considered due to dearth of knowledge in this area as well as the less than cooperative attitude of regulatory authorities in the affected regions to their use. This therefore represents a window of opportunity for future research in this area.

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