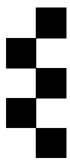

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The role of fintech in driving financial inclusion in developing and emerging markets: issues, challenges and prospects

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THE ROLE OF FINTECH IN DRIVING FINANCIAL INCLUSION IN DEVELOPING AND EMERGING MARKETS: ISSUES, CHALLENGES AND PROSPECTS

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THE ROLE OF FINTECH IN DRIVING FINANCIAL INCLUSION IN DEVELOPING AND EMERGING MARKETS: ISSUES, CHALLENGES AND PROSPECTS

Abstract:

Purpose - In recent times, various governments in the developing and emerging markets are increasingly embracing financial technology to help improve financial inclusion and integration within their countries. One of the primary goals of using such technology is to reduce poverty. This paper uses Nigeria as a case study to explore fintech innovations' effectiveness in developing and emerging markets in driving financial inclusion. It explores the challenges militating against financial inclusion and the role of government, financial institutions, and fintech companies in ensuring financial inclusion for the vast majority of the unbanked population in the developing and emerging markets.

Findings – The research showed that the financial inclusion gap has expanded despite the government, regulators, and financial institutions' various efforts to develop various digital platforms, including encouraging the use of smartphones for mobile payments and ATMs and mobile money. Several reasons are responsible for the gap in financial inclusion: illiteracy, poor infrastructural facilities, intermittent power supply, poor mobile receptions, especially in rural areas, constant bank network failures, unnecessary charges, information asymmetry, and data privacy breaches, amongst others.

Research methodology – This paper is based on doctrinal and comparative research methodologies. The researchers conducted a content analysis drawing on data from both primary and secondary sources, including existing legislation, journal articles, newspaper reports, and policy documents.

Practical implication – Financial inclusion through fintech is essential in eradicating poverty in developing and emerging markets if adequately implemented. Therefore, this paper will be useful to researchers exploring how technology influences financial inclusion. It will also aid policymakers and practitioners in financial technology regulation to improve their policies' effectiveness and financial inclusion implementation strategies in developing and emerging markets.

Originality/ Value - This research is significant, especially in developing and emerging markets, by exploring issues and challenges of fintech in promoting financial inclusion in challenging institutional contexts. This paper suggested potential areas for further research, particularly how gender affect access to financial services provided by fintech companies and other financial institutions.

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Keywords: Fintech, Financial Inclusion, Banking, Financial Exclusion, Unbanked, Institutional theory.

Article Types: Research Paper

1. INTRODUCTION

Over the past years, there has been an increase in the growth of financial technology, also known as fintech, which has changed the traditional approach to banking services and could have long-term positive effects driving financial inclusion in society. Financial technology or fintech is the term used to describe the process of financial innovation in carrying out financial services through technology. In other words, fintech connotes the use of technology to simplify and automate the delivery of financial services. The main elements that drive fintech are technological advancement, consumer behaviour and regulatory condition (Olowookere, 2019). One of the primary goals of using such technology is to promote the ease of doing business. The Central Bank of Nigeria (CBN) has previously issued directives on cashless banking, the first in 2007 and the second in 2013 (Olowookere, 2019). This led to an increase in fintech companies offering payment solutions; to remain relevant and competitive, various banks partnered with these fintech companies by integrating fintech services into their procedures for service delivery.

These are exciting times for the Nigerian financial sector as there has been an apparent reduction in the rigid systems of the traditional banking sector. Fintech is also considered the answer to the challenges in the financial sector that Nigeria has faced for several years. The utilisation of mobile technology such as Unstructured Supplementary Service Data (USSD), amongst others, is a step forward for the government to meet its social goal of providing financial services for citizens of the country (Harlem, 2021). This laudable effort means that financial technology has an important role to play in advancing financial sustainability in Nigeria. Demirguc-Kunt and Klapper (2012) argued that efficient and inclusive financial systems would benefit poor and underprivileged people. In a country with a high financial exclusion, most people live in poverty because they have to depend on their inadequate savings to acquire formal education or become entrepreneurs. In the same vein, micro, small and medium businesses also rely on their meagre earnings to achieve promising growth opportunities; such conditions advance income inequities and slower economic growth (Demirguc-Kunt and Klapper, 2012).

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Financial inclusion and financial technology or digital finance have generated several debates recently. These debates are not limited to their supposed importance as a driver of economic growth but also to the transformation of financial services in the post-COVID-19 era. In a World Bank report, there are about 1.7 billion unbanked adults globally. (Global Findex Database 2017). The majority of these unbanked adults can be found in seven developing and emerging economies: Bangladesh, China, India, Indonesia, Nigeria, Mexico, and Pakistan (Global Findex Database 2017). Unbanked refers to those adult populations currently excluded from financial services because they do not fully participate in formal financial systems. In other words, being underbanked means that a number of the adult population does not have bank accounts or use any services provided by banking institutions. A recent study by the British research platform Merchant Machine revealed that over 60 per cent of the Nigerian adult population are unbanked (Ventura, 2021).

Typically, most Nigerian unbanked population comprise low-income earners who control much of the economy's idle funds, although each holds such funds in small amounts. The use and accumulation of these resources constitute an enormous source of capital that can be invested in the long term at a low cost. One important thing that has been revealed over the past few years is that technology and digitisation are essential tools for stimulating financial inclusion, especially in Nigeria, where mobile phones are used in every part of the country, including rural areas. Different studies have shown that fintech in the provision of services in the financial system, such as payment systems, is a growing initiative that has come to stay. However, in light of the recent development in the world vis a viz the outbreak of COVID-19, there is the need for governments and financial institutions to synergise to bridge the gap in financial inclusion and ensure that more people have access to low-cost financial services. There have been several pieces of research on financial inclusion, particularly as it relates to traditional face-to-face banking; however, very few of those research have looked at digital financial inclusion, particularly in the developing and emerging markets. (Ozili, 2020)

Given the above gap in the literature and drawing on the institutional theory, this paper seeks to address the following question: To what extent are the Nigerian people financially excluded, and how can fintech help promote financial inclusion in Nigeria? The second section of this paper critically explores the meanings of, and linkages between, financial inclusion and financial technology. This theoretical and conceptual framework underpins the discussions in the remainder of this paper. The third section examines the factors that promote or impede the

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role of financial technology in financial inclusion. The fourth section analyses the levels of financial inclusion and fintech in Nigeria and impediments to the role of fintech in promoting financial inclusion. The fifth section offers recommendations to improve Nigeria's institutional environment to enable fintech to promote financial inclusion. The sixth section discusses the broader lessons from the Nigeria case study for the developing and emerging markets. The final section concludes this paper and suggests areas for further research.

2. THE MEANINGS OF AND LINKAGES BETWEEN FINANCIAL INCLUSION AND FINANCIAL TECHNOLOGY

Different countries across the world have created regulations to help alleviate poverty and increase the standard of living of their citizens. These countries have devised several ways to reduce poverty and improve their citizens' financial status. For example, Kenya developed a vision 2030 blueprint to direct the country to achieve middle-income status by decreasing the number of adults without access to finance from 85 per cent to less than 70 per cent (Mwega 2014). One of the significant ways of poverty reduction explored by different countries is financial inclusion, as it promotes inclusive growth (Sahoo et al., 2017). The ability of citizens to access formal financial services is an essential means to help change the lives of low-income households. Financial inclusion can aid poverty alleviation and inequality by assisting people in investing in the future, evening out their consumption, and managing financial risks. Before delving into the meaning of financial inclusion and fintech, as well as exploring the linkages between them, it is imperative to briefly examine the institutional theory which underpins the discussion in this paper, particularly as it relates to Nigeria's challenging institutional contexts.

2.1 Institutional Theory and Financial Inclusion

Applying the institutional theory to financial inclusion discourse helps provide a conceptual and analytical framework for understanding the importance of functional institutions in driving financial inclusion and will also help in recommending ways to solve the problem of financial exclusion in developing and emerging markets. Institutional theory is the processes and mechanisms by which structures, schemas, rules, and routines become established as authoritative guidelines for social behaviour (Scott 2004). Institutional theory is described as the policy-making that emphasises formal and legal aspects of government structures. Institutional theory is based on the notion of institutions; Ohnesorge argued that economic behaviour, whether by the individuals or by the firms, is affected by the institutional setting in which the actors find themselves (Ohnesorge, 2007). Therefore, the institutional theory

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explains how Nigeria's institutional environment impedes financial inclusion by limiting property rights, access to financial services, and other financial opportunities that should be available to the adult population. The institutional theory is based on the notion that institutions influence market participation; therefore, institutions supporting market development are crucial for economic growth and poverty reduction (Tebaldi and Mohan, 2010). Functional institutions are a significant catalyst for social progress and, more specifically, financial inclusion, reducing poverty in society (Park and Mercado, 2018). Evidence suggests that financial inclusion is linked to the presence of functional institutions; for example, in the United Kingdom, where there are functional institutions, the level of financial exclusion is relatively low. Kempson and Collard (2012) examined the United Kingdom's progress toward financial inclusion and established a ten-year plan based on evidence from available data. Kempson and Collard's framework aims for everyone to access, utilise, and keep a suitable account or similar product to which money could be sent and maintained safely and simply. It also meant that everyone had the confidence and expertise to use financial services appropriately for daily and periodic needs. More recently, in the bid to promote financial inclusion, the United Kingdom government introduced some policies such as the No-Interest Loan Scheme, the launch of the Breathing Space scheme, and the regulation of the Buy-Now-Pay-Later scheme, which aligns with Kempson and Collard's framework. However, it is difficult to replicate these schemes in Nigeria, given that institutional settings are heterogeneous, and these institutional differences increase the gaps in financial inclusion among different countries. The institutional frameworks in developing and emerging markets are challenging due to the institutional voids in those economies. Institutional voids or challenging institution contexts connotes weak and non-functioning institutions (Khanna and Palepu, 1997). Therefore, within the institutional theory framework, this paper argues that the Nigerian institutional environment is one factor associated with financial exclusion in the country. This emanates from the political and socio-economic system arrangement evidenced by the lack of functioning institutions which broadens the country's financial inclusion gap.

2.2 Meaning of Financial Inclusion

Over the years, different views and definitions of financial inclusion have evolved. This paper argues that defining financial inclusion is vital in developing a conceptual framework, identifying the underlying factors that reduce access to the financial system and proposing ways fintech will help drive financial inclusion in challenging institutional contexts. A thorough look at existing literature suggests no convergence of the definition of financial

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inclusion (Cihak et al., 2021). As gauging inclusivity is considered delicate, non-inclusivity in terms of finance is globally construed to mean the exclusion of individuals, particularly adults, from access to the financial system. Although, several works of literature on financial exclusion had focused on exploring the effect of social exclusion and thus mainly concentrated on the issue of geographical access to financial services (Leyshon and Thrift 1996). It is argued that financial exclusion is a high level of social exclusion. Financial exclusion refers to the inability of the citizens to access formal financial services easily, even made worse where there are institutional voids, as evident in developing and emerging markets. Financial exclusion also refers to a particular group of the society's inaccessibility to appropriate, low-cost, safe and equal financial services from major financial institutions. Therefore, it is necessary to consider some definitions of financial inclusion contrasting with the concept of financial exclusion to lay the necessary foundation for the discussion in this paper.

Globally, the financial inclusion average is defined as the wide variety of adults with access to financial services being less than 50.0 per cent. The issue is higher in countries in developing and emerging markets, such that reaching a higher financial inclusion degree has become a worldwide challenge (Ardic et al., 2011). The global target has been to eliminate all barriers, including education, gender, age, irregular income, regulation and geographical locations, which had collectively affected billions of adults worldwide by limiting their right to access and use financial services.

Financial inclusion refers to the access and provision of financial services to all citizens, especially the low-income earners, poverty-stricken and marginalised individuals in society (Ozili 2018). It can also be defined as a person's access to formal financial institutions and services, such as an account that provides the opportunity to save and borrow money formally (Zins and Weill, 2016). Another definition of financial inclusion sees it as a system or situation that advances the ease of access to formal financial systems by the citizens of a country. It describes a process where all citizens in an economy do not have issues with opening a bank account, credit is affordable, and they can quickly and consistently use financial system products and services without problems (Kama and Adigun, 2013). These financial services range from investments to loans, management of funds and assets, and other financial products offered by fintech companies (Kama and Adigun, 2013).

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The U.K. Treasury Committee considers financial inclusion as the capability of members of the society to get access to appropriate financial products and services (H.M., Treasury 2004). A careful look at the above definitions shows one common denominator that these definitions have in common. It accentuates that each citizen should have access to existing financial services. One would argue that although these definitions attempt to capture financial inclusivity in general terms, they are too broad because not all citizens need access to financial services. For example, children are citizens; however, they may not require access to financial services. Though some parents could open accounts for their children and deposit monies in those accounts, that in itself does not translate to financial inclusion; it takes more than the mere opening of an account for someone to be regarded as financially included.

The financial sector research has recorded the increasing importance of financial inclusion as a game-changer for economic growth (Thiel, 2001, Ratnawati, 2020). In contemporary times, financial inclusion is considered as a right of all citizens to social inclusion, a better quality of life and a means of firming up the economic capacity and capabilities of the adult population, particularly the low-income earners in a country. Therefore, social campaigners, human rights activists, and other relevant stakeholders have argued that financial inclusion is a fundamental right for all citizens because it emphasises fairness and equality (Sultanov and Shakhidi, 2021).

In contrast, financial exclusion refers to the incapability of the citizens to easily access formal financial products and services. According to Mohan (2006), financial exclusion refers to the lack of access to specific aspects of the society to appropriate low-cost, fair and safe financial services from major financial providers. Mohan (2006) argued that as soon as the access to financial inclusion improves, inclusion gives numerous advantages to the consumer, the regulator and the economic system. In addition, financial institution loans can be used for more than one purpose, such as making small price remittances at low value and purchases on credit. In summary, financial exclusion is a process whereby people encounter difficulties accessing and/or using financial services and products in the mainstream market that are appropriate to their needs and enable them to lead an everyday social life in the society in which they belong (European Commission, 2008).

The Centre for Financial Inclusion (CFI) provides a holistic definition of financial inclusion. It defines financial inclusion as a state where all adults who can use them have access to a whole collection of high-quality financial services, provided at affordable prices, convenience, and

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with dignity for the clients. (Gardeva, 2010). It is a state where various providers deliver economic offerings to ensure that everyone who can use them has access to them, including the poor, disabled, rural, and other excluded populations (Gardeva, 2010). The World Bank on financial inclusion posits that access to broad financial services depicts the absence of price and non-price barriers within the utilisation of the financial services (World Bank, 2008).

This paper has explained the idea of financial inclusion in various ways; however, these different explanations all seem to have analogous records and content materials on the subject. Most scholars have defined financial inclusion broadly as the accessibility to financial services. Amidžić *et al.* (2014) defined financial inclusion as an economic state whereby no person is denied access to major financial products; Sahay *et al. (2015)* stated that financial inclusion is the access, usage and dissemination of financial products at affordable prices to the society. Sarma and Pais (2011) provided an all-encompassing definition of financial inclusion. They defined financial inclusion as a process that ensures ease of access, availability and usage of the formal financial system for all individuals in an economy (Sarma and Pais, 2011). They further argued that financial inclusion that offers ease of access for all segments of a society enhances efficient allocation of resources and reduces informal sources of credit, which are often exploitative. (Sarma and Pais, 2011). It is worth considering the definition of financial inclusion offered by the United Nations as this will underpin the rest discussions in this paper. The U.N. defined financial inclusion as when financial services are granted to all bankable individuals in society (United Nations, 2005). Financial inclusion does not necessarily require eligibility to use the service, but it grants the right to choose to use it if desired (United Nations, 2005). The working or operational definitions of inclusive finance for this paper emphasise the role of financial institutions or service providers in the process, based on bankable adults' accessibility to financial goods and/or services.

2.3 Financial Technologies

Before exploring the definitions of fintech, examining the historical development of financial technologies will be helpful as this would lay the necessary foundation for understanding the nexus between fintech and financial inclusion, particularly as it relates to countries with challenging institutional contexts. Fintech has been very topical in recent times; however, the concept is not new. The historical concept dates back to July 1867, when the foremost communication through the Trans-Atlantic transmission cable occurred. The connection successfully reduced the communication time between North America and Europe from ten

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days to seventeen hours. It also improved services related to the financial sector, known as fintech (Leong and Sung, 2018). Therefore, the development of financial technology is connected to the development of enabling technologies. According to Leong and Sung (2018), there are three key stages of financial technology. The first stage is known as fintech 1.0. During fintech 1.0, the concept of financial globalisation came into use during this period. Through fintech 1.0, the important enabling technology included Trans-Atlantic transmission cable and mainframe computer systems, amongst others. Those technologies breed associated financial technology products, some of which include SWIFT and ATMs. In the 1950s, credit card systems were introduced to reduce the stress of carrying cash.

At some point, the second stage of fintech 2.0. started; this period led to the change from analogue to digital, which introduced the traditional financial institutions. It was the launch of the first handheld calculator. Several significant trends took shape in the early 1970s, such as the creation of NASDAQ, the world's first digital exchange, which marked the beginning of how financial markets work today. SWIFT (Association for Global Interbank Financial Telecommunications) was founded in 1973 and is the first and most commonly used communication protocol between financial institutions that facilitate numerous cross-border payments. (Mirjam, 2021).

The 1980s saw the rise of mainframe banking, and the world began to use online banking platforms, which flourished in the 1990s with the internet and other business models. Online banking has led to a drastic change in the way people view money and their relationships with financial institutions. At the beginning of the 21st century, banks' internal processes, relations with outsiders and retail customers became wholly digitalised, and in 2008, the era ended with the global financial crisis. In contrast, more digital technology evolved during the third stage, known as fintech 3.0. which gained some prominence as the global financial crisis quickly became a general economic situation, and the public had lost confidence in the traditional banking system.

Consequently, this and the loss of many finance professionals led to a change in mindset, paving the way for a new initiative in the financial industry, fintech 3.0. This era was marked by the emergence of new players alongside existing players, such as banks. The release of Bitcoin v 0.1 in 2009 was another event that significantly impacted the financial world and was immediately followed by the explosion of several cryptocurrencies. Another critical factor that

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has shaped the face of fintech is the mass market penetration of smartphones, enabling millions of people worldwide to access the internet. Smartphones have also become the primary means for people to access the internet and use various financial services. 2011 saw the introduction of Google Wallet, followed by Apple Pay in 2014. Currently, the world is experiencing a transition from Fintech 3.0 to Fintech 3.5 (Mirjam, 2021).

The advent of fintech has given rise to 'financial service disintermediation' and the need for a new form of protection for consumers and partners (Iman, 2020). Fintech start-ups can reduce the intermediation costs and minimum capital requirements usually related to conventional banking systems (Iman, 2020). The utilisation of big data analytics and data services has revolutionised how data are collated, processed, and analysed, notably reducing costs.

Gomber *et al*. (2017) define fintech as a coinage that comes from 'Financial' and 'Technology' and refers to the connection of modern Internet technologies with commercial activities established in the banking sector. They view fintech as initiatives in the financial sector that challenge established roles, business models, and service offerings by introducing technology-based innovations (Gomber *et al*., 2017). On the other hand, Hung and Luo (2016) identify five dimensions that can change the dynamics of the fintech market: actors, added value, rules, tactics, and scope. Generally, in most literature, fintech is used purely to denote functionality, providing variations in the subject (Hung and Luo, 2016). For example, Puschmann (2017) argues that fintech is incremental or disruptive innovations in or in the context of the financial services industry that are induced by information technology developments and lead to new intra- or inter-organisational models, products and services, organisations, processes and systems (Puschmann, 2017). In comparison, N.G. and Kwok (2017) classify fintech organisations into four innovations with different specifications: efficient payment process, robotic advisers, peer-to-peer load and deposit platforms and crowdfunding.

Therefore, at this point, it is necessary to explore the nexus between financial technology and financial inclusion. 'Fintech' is an abbreviation of' ‘financial' and 'technology,' used to describe any technological revolution in providing financial services. It covers various aspects, including financial literacy, wealth/asset management, lending and borrowing, retail banking, fundraising, money transfers, payments, investment management, digital insurance, and Cryptocurrency (Gomber *et al.,* 2017). Financial Technology also refers to the use of technology to simplify and automate the utilisation and the delivery of financial services. It

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aids businesses and their customers in carrying out, managing and advancing their financial relations through software-enabled devices (Leung and Sung 2018). According to Leung and Sung (2018), fintech refers to innovative ideas that advance financial service processes by recommending technology solutions according to various business circumstances, whilst the ideas could also create models or even new businesses. Simply put, it refers to the means through which opportunities are created by reducing the costs of providing financial services to advance financial inclusion.

3. FACTORS THAT PROMOTE OR IMPEDE THE ROLE OF FINANCIAL TECHNOLOGY IN FINANCIAL INCLUSION

Several factors must be taken into account when measuring financial inclusion, as evident from studies on the subject. The studies on financial inclusion could be divided into three major parts: constructing financial inclusion metrics, exploring financial inclusion drivers, and investigating the relationship between financial inclusion and several financial and economic growth characteristics. One common feature of these studies is the accessibility to financial services by adult members of society. Most studies had based financial inclusion on the number of adults within the society who possess bank accounts. However, the studies forget that merely having a bank account does not transpose as being financially included. This is because of the numerous impediments preventing these individuals with bank accounts from using those accounts. Some of these impediments are the remoteness of bank branches, the cost of transactions, illiteracy and customers' distrust. Therefore, the next sections of this paper will examine the factors that promote or impede the role of fintech in financial inclusion in some developing and emerging economies.

3.1 Financial Inclusion in Sub-Saharan Africa

Inclusive finance in Africa has gained much attention within the academic community and policy-making circle; thus, different studies have emerged in this area. For instance, Nanziri examined the state of financial inclusion concerning the gender gap in South Africa and discovered that women primarily use structured financial and informal financial mechanisms while the men utilise recognised credit facilities, and there are no differences or gaps in their access to financial services (Nanziri, 2016). Zins And Weill investigated factors for financial inclusion in 37 countries and found that being a man who is rich, properly educated and older is connected with greater financial inclusion in African countries (Zins and Weill 2016). A study conducted by Demirguc-Kunt and Klapper on African countries found that although there

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is a growth within the financial sector in African countries, they lag behind developed economies in the usage and access of financial products by adults and firms (Demirguc-Kunt and Klapper 2012). The research also found barriers to financial inclusion that both individuals and firms face; when a country has a more competitive, open, market-oriented and well-regulated financial system with more developed contractual and informational infrastructures, barriers tend to lessen. Financial inclusion is better in some developed economies; for example, in the United Kingdom, Germany and Luxemburg, fintech companies are able to drive financial inclusion more efficiently because of these countries' high-level potential for financial sector development, thereby bridging the gap in financial inclusion in those countries. In the UK, Germany and Luxembourg, financial institutions are urged to take a proactive approach, recognising persons without bank accounts or other financial services as a commercial potential rather than only a source of humanitarian donations (Marshall, 2004). However, research has shown that a significant number of people are still financially excluded in some European Union countries, such as Bulgaria, Cyprus, Greece and Romania because they have no access to formal credit (Grazioli et al., 2021). These are people who have experienced or are experiencing unexpected events, have no access to income, and cannot access financial services frequently due to illiteracy and geographical dislocation in areas with economic issues. In contrast, in most African countries, financial inclusion is impeded by physical, regulatory, and financial obstacles and removing these seems complicated since it also necessitates addressing the underlying structural reasons (Demirguc-Kunt and Klapper 2012).

Girón et al. researched financial inclusion measurement in some developing and emerging economies in Asia and Africa and found that inclusive finance is low in these countries. The results show that gender can affect the type of savings, formal or informal; consequently, they argued that women could better access financial services if the current financial approaches were restructured (Giron et al., 2021). They posit that lawmakers should focus more on the importance of inclusive finance for youths and women. Chikalipah examined the drivers of inclusive finance in Sub-Saharan Africa in 2014 and found that low educational attainment is the region's most significant barrier to financial inclusion (Chikalipah, 2017). According to Adalessossi and Kaya (2015), who investigated the degree of financial inclusion in 41 African nations, 27 of them had a poor level of financial inclusion. The majority of these countries are low-income. The variables included in the discriminant model analysis were the number of adults with outstanding mortgages, the use of a formal account, and the account from a formal financial institution (Adalessossi and Kaya, 2015).

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According to Ulwodi and Muriu, there are differences in financial inclusion across countries (Ulwodi and Muriu, 2017). One would argue that though these individual differences are key characteristics when measuring financial inclusion; however, the country's institutional arrangement plays a significant part in shaping these differences. They also investigated different barriers within African countries. The main ones were the lack of money resources, high cost of financial services, distance to the closest financial institution, low-income levels and illiteracy (Ulwodi and Muriu, 2017). Both access and utilisation of financial services, according to Aduda and Kalunda, are complementary to one another and must be analysed in order to quantify financial inclusion (Aduda and Kalunda, 2012). Apart from formal banking models, their research on financial inclusion in Kenya concluded that informal financial services should be incorporated into the overall financial framework since they promote financial inclusion in developing and emerging economies (Aduda and Kalunda, 2012).

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3.2 Financial Inclusion in Asia

In some Asian countries such as India, financial inclusion is a current policy priority as it is considered that when there are no financial services, it leads to many socio-economical problems (Mani, 2019). According to Mani, in India, over time, financial inclusion has been a primary concern of the government and the central bank of India; however, despite this level of focus and efforts, financial inclusion is still lacking in the country (Mani, 2019). This failure has been attributed to ineffective delivery models for financial inclusion as they are not entirely convinced that financial inclusion is a profitable business opportunity (Mani, 2019). This seems to contradict the research conducted by Huang et al., who found that financial inclusion plays a vital role in nations with opportunities to advance and grow their markets (Huang et al., 2021). However, recent research conducted by Tsai and Kuan-Jung found that China experienced massive growth in fintech products through higher demand for internet-based services (Tsai and Kuan-Jung, 2017). The Chinese government's 2016-2020 plan was developed to encourage digital technologies to increase financial inclusion and social development (Tsai and Kuan-Jung, 2017).

Fungacova and Weill investigated inclusive finance in China by comparing the extent of availability of finance in China with some other developing and emerging countries using the World Bank's Global Findex Data. While China's financial inclusion is comparatively better regarding formal account holding, it scores low on accessibility to traditional credit (Fungacova and Weill, 2015). The Chinese people prefer to borrow from family/friends than obtain credits

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from financial institutions. A well-educated male who is older and has a better income is most likely to use formal financial services (Fungacova and Weill, 2015). Regarding barriers to financial inclusion in China, the lack of money is more likely to be an issue than being poor/illiterate or because someone else in the family already has a financial account. Corrado and Corrado (2015) use demographic and socio-economic data from 25,000 European households from the second round of the Life in Transition Survey conducted during the global financial crisis 2007-2008 to examine the determinants of financial inclusion in eighteen Eastern European economies and five Western European countries. They discovered that households in Eastern Europe who were afflicted by unemployment or income shocks and did not have any assets to pledge were more likely to be financially excluded (Corrado and Corrado 2015).

In contrast, literate Chinese are more concerned with transaction costs and trust in the financial systems. Finally, Fungacova and Weill research found that income and education influenced the use of alternative sources of credit, which is choosing between formal and informal loans; therefore, one would argue that literacy does not necessarily result in better access to formal loans (Fungacova and Weill, 2015). People who are educated could still be financially excluded for several reasons, as evident in the next section of this paper.

According to Ayyagari and Beck, just around a quarter of persons in Asia have bank accounts with financial institutions, and about a third of businesses have some form of loans with financial institutions (Ayyagari and Beck, 2015). Their research also showed that the most prevalent hurdles to financial inclusion in Asia were high expenses, limited geographic access, and a lack of identity (Ayyagari and Beck, 2015). Zhang and Posso use new multidimensional indicators for financial inclusion, including the least-squares, quantile estimates, and propensity score–matching approaches to assess the influence of financial inclusion on family income (Zhang and Posso, 2017). They obtained household finance survey data covering more than 6200 Chinese households, and based on their findings, they argued that financial inclusion helps reduce income inequality (Zhang and Posso, 2017). Their research revealed that financial inclusion strongly affects household income with different income levels; however, households with low incomes were found to benefit more from financial inclusion than high and mid-level income ones (Zhang and Posso, 2017).

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Sharma examined the relationship between financial inclusion and economic development in India between 2004-2013 (Sharma, 2016). The study revealed that banking penetration, availability of banking services, and usage of banking services are the three key characteristics of financial inclusion that are being focused on (Sharma, 2016). She argued that there is a favourable relationship between economic development and many aspects of financial inclusion (Sharma, 2016). The above view is supported by Marshall (2004), who argued that the United Kingdom is trying to combine top-down strategies setting the context for community investment within bottom-up community-based ideas as a way of promoting inclusive finance. However, the British example shows that financial inclusion and community investment are challenging to accomplish in an open and integrated financial system controlled by substantial multinational institutions, where a history of self-regulation and independence from governmental involvement is greatly valued. The subprime mortgage crisis in the United States and the United Kingdom demonstrated how financial inclusion policies could fail if not accompanied by robust policy and regulatory measures. The sub-prime mortgage crisis highlighted the reality that inclusion at higher-than-normal rates and the debt that results from it could not be sustained (Chima 2011).

4. THE LEVEL OF FINANCIAL INCLUSION AND FINTECH IN NIGERIA AND IMPEDIMENTS TO THE ROLE OF FINTECH IN PROMOTING FINANCIAL INCLUSION.

4.1 Level of Financial Inclusion in Nigeria

As previously stated, Nigeria is one of the very few countries with the highest unbanked population in the world, given that more than 60 percent of its adult population does not have access to financial services. Sanusi (2011) attributed the increase in poverty rates in Nigeria to the challenges of financial exclusion. He argued that to attain a high level of financial inclusion in Nigeria, empowering 70.0 per cent of the poor population would increase the economic growth as such growth will reduce poverty (Sanusi, 2011). Poverty, financial literacy, absence of accessibility, affordability, lack of confidence by the user and Nigeria's challenging institutional context are among the reasons for financial exclusion in Nigeria. Therefore, consumers' better awareness of financial services and good financial infrastructure would positively affect financial inclusion (Bayero, 2015).

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Mbutor and Uba (2013) conducted research examining the impact of financial inclusion on financial policy in Nigeria between 1980 – 2012. The study revealed that despite the increase in the number of banks in Nigeria, many Nigerians are still unbanked. Most adult and small businesses in Nigeria are financially excluded because they do not participate in formal financial systems. Despite the claim by the CBN that the introduction of the cashless policy will be favourable to the Nigerian economy by promoting the financial inclusion of many adult Nigerians (Odior and Banuso 2012), many Nigerians are still transacting exclusively in cash and do not have access to credit beyond their personal networks and informal lenders. Adeola and Evans (2017) investigated the effect of financial inclusion and financial development on economic diversification in Nigeria during the periods 1981 to 2014. Their research revealed that financial inclusion positively and significantly impacted Nigerias'economic growth.

Across the world, governments and financial institutions have been promoting the principle of financial inclusion, intending to get financial services to the unbanked and underprivileged members of society. It is argued that financial inclusion is an essential tool for reducing poverty and increasing economic growth in any society, particularly in climes with challenging institutional contexts. There have been several initiatives aimed at promoting financial inclusion in Nigeria. For example, to pursue its financial inclusion goals, the CBN introduced the cashless policy in the 2012 fiscal year to reduce the use of physical cash for transactions. However, this has further broadened the financial exclusion gap for several reasons. For example, people are charged indiscriminately for making bank transfers, depositing money in their banks, and using their ATM cards to pay for goods and services. These arbitrary charges, mostly hidden from the customers as they are usually debited after the transactions, discourage many people with bank accounts from using them due to the cost associated with using such services.

The Central Bank of Nigeria, in furtherance of its financial inclusion objective, also had in 2018 issued a National Financial strategy to provide its execution plan for financial services distribution. In order to accomplish a completely banked Nigeria, there is the need to accelerate the merging of the industry's different players to encourage financial inclusion. This convergence requires regulators to assume a functioning part, and the CBN seems to comprehend this fact. At first, the guidelines in Nigeria did not permit non-financial institutions to offer any type of financial assistance; however, this has been explored and altered through the Guidelines on Mobile Money Services in Nigeria and the Guidelines for Licensing and

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Regulation of Payment Service Bank (PSB). The significant focal point for the regulation mentioned above is that it should leverage technology to promote financial inclusion and enhance access to financial services for the rural poor, low income earners and financially excluded individuals.

Thus, the above initiative through fintech has provided a platform enabling some Nigerians to engage in different transactions, such as buying and selling various goods online through their mobile phones from the comfort of their homes. It also enables some individuals to carry out other bank transactions by using mobile apps to manage their finances, thus leading to a high number of citizens, enabling the financial sector to optimise its benefits. Additionally, start-up businesses could develop new business models that allow business owners to work from home through fintech and save the cost of renting a physical office space (Wayne et al., 2020). Through payment-based fintech systems, the financial regulator can supervise all financial transactions for equality transparency and identify suspicious activities connected to fraud and other financial crimes. However, many Nigerians remain financially excluded despite the benefit derived from using financial technology to drive economic growth, such as reducing the level of poverty in the country. In light of the above, it will be helpful to explore further the issues and challenges of fintech and financial inclusion in Nigeria.

4.2. Challenges of Fintech and Financial Inclusion in Nigeria

The lack of access to financial services by adults worldwide is a significant problem for worldwide growth and advancement (Giwa-Osagie and Osiobe, 2021). Research has shown that just under 40 per cent of the Nigerian adult population has access to financial services (EFInA, 2021). It is argued that the number of the Nigerian adult population who have access to financial services is still less than that. This is because merely having a bank account does not translate to having access to financial services, particularly in a country like Nigeria with a challenging institutional context. For example, some people may have a bank account but are impeded by certain factors that make the accounts unusable or prevent them from realising the full benefit of owning an account compared to someone with a similar account in developed economies like the United Kingdom. Therefore, the extent of financial inclusions in countries with challenging institutional contexts has become a topical issue. Though fintech is relatively new and still emerging, some pertinent issues must be tackled to enable the seamless integration of fintech services into the financial sector, thereby improving its benefits for customers. This will only be achieved if the challenges militating against the use of fintech to

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promote financial inclusion in Nigeria based on the country's institutional context are identified, and solutions are proposed to address these problems. Therefore, the next section of this paper deals with the challenges of fintech in promoting financial inclusion in Nigeria.

4.2.1 Regulatory Issue

Financial services are one of the most regulated areas in the world, and regulatory concerns have increased as technological integration has increasingly become more complicated. As mentioned previously, there have been efforts to regulate this area through innovation and digitisation; however, regulators still have difficulties balancing the support for innovation and ensuring financial stability and consumer protection. The CBN recently issued a guideline forbidding financial institutions from transacting on Cryptocurrency (Bakare, 2021). Also, recently the Securities and Exchange Commission of Nigeria (SEC) issued a policy direction limiting unregistered organisations from allowing for the exchange of securities in Nigeria (SEC 2021). These arrangements by the regulators have raised some concerns amongst stakeholders; however, the regulators have argued that these guidelines/policies are essential to keep a fair and stable financial framework (Nwanisobi, 2021). Based on the above, one would argue that there seems to be a disconnect between regulators and relevant stakeholders. Therefore, to avoid challenges of this kind, CBN and SEC should provide a platform for discourse whereby innovators can discuss how existing regulations can advance the development of fintech and how their products can fit within these regulations. Regulators ought to likewise consider the fact that the battleground may be uneven and unbalanced. For instance, if fintech companies are to have similar limitations as traditional banks, this may be restrictive (Giwa-Osagie and Osiobe, 2021). Additionally, since it serves new markets and gives financial tools to new populations, fintech operates in an area where regulations are at the moment sparse.

4.2.2. The Predominance of Financial Illiteracy

Amidst the unbanked and unmerited, there is a viewpoint that they need not bother with the financial products offered by banks. Countless people in Nigeria resort to casual loaning from loved ones rather than approaching a bank for a loan. Similarly, for the most part, when it comes to savings amongst the unbanked Nigerians, they would prefer to engage in a highly conventional approach to savings by concealing their cash in protected spots at their home or resort to casual saving clubs fondly called Osusu (Osiki, 2020). Such practices have made it hard for financial companies to break into these areas. However, some fintech companies have

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tried to introduce computerised investment apps such as Piggyvest, Bamboo, Risevest, Chaka and Trove to encourage individuals to invest or save their money outside the traditional banking system. Using such computerised investment apps requires the individual to be literate to a certain extent to understand the nature of the investments or savings they are entering into. Consequently, there is still a need to expand the degree of financial aid education to get to a bigger pool of customers, as research shows that more than 60 per cent of Nigerian adults remain unbanked (EFInA, 2021).

4.2.3. Stakeholder's Distrust

Another challenge faced by fintech companies militating against possible financial inclusion in Nigeria is a lack of trust from stakeholders regarding financial technology companies and their products. This is significantly due to the fear of the unknown, sparse regulations, and reluctance to share personal information. Many consumers struggle to catch up with the speed of the quickly developing financial technology. Since some conventional banks have acquired some degree of trust through long-term positive performance, entering into partnerships with such banks can assist fintech companies with the trust level expected to scale through (Giwa-Osagie and Osiobe, 2021).

4.2.4. Use of Technology

The pith of fintech is the disbursement of wealth through digital methods to reach the unbanked and underprivileged populaces. It should be designed to help reduce poverty in any given country; therefore, fintech should provide formal financial products that are seamlessly delivered at a reasonably low cost to citizens. However, the embrace of fintech by Nigerian financial institutions has further widened the country's level of financial exclusion because individuals who previously used traditional banks can no longer do due to illiteracy. These affected customers are then added to the underbanked, increasing the number of people systematically pushed out of the banking corridors due to a lack of understanding of the use of advanced financial banking platforms, such as internet banking, mobile banking, and automated banking teller machines, amongst others. However, the commitment of the conventional cash loan specialists, Osusu/Esusu, towards financial inclusion is evident from how this casual area has served the requirements of uneducated individuals residing in rural communities, who do not have access and capability to participate in the digitised banking system because the current legal and regulatory framework has systematically ignored them due to Nigeria's institutional context. This class of individuals has effectively been excluded

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from the advanced financial framework that requires that one be taught and have innovative abilities before adjusting to the framework.

4.2.5 Lack of Infrastructure

The presence of functional infrastructure is key to how fintech can help promote financial inclusion. According to Manyika (2016), three building blocks are required to promote financial inclusion: widespread digital infrastructure, a dynamic financial services market, and products people prefer to existing alternatives, which must be provided at a minimal cost. However, due to the institutional voids in Nigeria, there are several challenges with physical infrastructure ranging from the epileptic power supply, unstable mobile network receptions and the outdated servers and other pieces of equipment used by the banks. This dearth of infrastructure results in a flawed payment system evidenced by duplicating transactions and applying several charges to customers' accounts. It is argued that with the proper infrastructure in place and an adequate legal and regulatory framework aimed at protecting customers, fintech can be a tool to drive financial inclusion. The unbanked population will be motivated to take full advantage of such services if they are seamless and cost-effective.

5. RECOMMENDATIONS ON IMPROVING NIGERIA'S INSTITUTIONAL ENVIRONMENT TO ENABLE FINTECH TO PLAY ITS FINANCIAL INCLUSION ROLE

Fintech is fast becoming a global phenomenon, led by innovators, studied by researchers, and is now getting regulators' attention. Expanding technological affordances have changed the game. Fintech is not without its challenges, as discussed above; however, changes need to be made to keep the momentum of the innovation going. Therefore this paper will make the following recommendations.

First, fintech companies must develop relational trust with consumers and other stakeholders and create innovative intervention methods to foster desired behaviours (Bofondi and Gobbi, 2017). Regulators and academics need to focus on responsible innovations that will take into account the elements of entrenched trust, demographic diversity and collaborative attitude.

Second, fintech start-ups need to test, configure, and build applications that include various and usually heterogeneous technologies in building their technological platforms. Testing through live simulations and realistic operating conditions is essential for the creation process.

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This will help fintech companies to understand the consumer market better and how they will include them in the provision of financial products (Lockton *et al*., 2010).

Third, this has to do with the development of the Regulatory sandboxes; the regulatory sandbox idea has started in different jurisdictions to give a safe environment for fintech start-ups to carry out real-world market research and market reaction testing without needing a license. The United Kingdom adopted this idea in 2016. This has helped fintech start-ups develop long-term experimentation abilities, which is vital for innovation and allows the start-ups to understand the needs of the consumers (Zetzsche *et al*., 2017). These initiatives can play a vital part in the growth of fintech and financial inclusion.

Fourth, the fintech industry is a fast-growing area; therefore, laws that advance its development and consider the industry's peculiarities as a whole must be enacted. The CBN and SEC, the primary regulators of Nigeria's financial sector, must ensure that they put adequate measures in place to encourage innovation and financial inclusion in Nigeria. Additionally, the CBN needs to review its policies to incorporate telecommunication companies such as mobile operators. It is evident that these telecommunication companies have better access to the unbanked in society as more than 90 percent of Nigeria's adult population have a mobile phone and incorporating these telecommunication companies will advance financial inclusion in Nigeria (Lockton *et al*., 2010). Furthermore, a better review of the business model on innovations is necessary to reduce the tension between regulatory requirements and consumer acceptance (Arner *et al*., 2017). Professionals and analysts working at the intersection of technology, politics, and financial services play a specifically important role. More efforts are required to develop compliance toolkits that enable fintech start-ups to meet complex cross-border regulatory requirements. Innovation managers have numerous opportunities to engage with regulators and raise awareness of rapidly emerging technologies and their implications for market integrity, stability, and poverty eradication. Similarly, when the regulators have dialogues with fintech companies, they can learn about the sector, which will enhance regulators' awareness of consumer habits, behaviours, and desires. This awareness can add to the development of regulatory systems that will help grow consumer trust in fintech companies and eventually allow more people access to use their services (Mention, 2019).

Fifth, there is a need for the financial services to be well-communicated to the consumers, especially in locations where the consumers may have difficulties accessing technology. In

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such instances, fintech companies and banks can use alternative means of communication by sending canvassers to pass the message to the people. In furtherance of the government's goals to increase financial inclusion and reduce poverty, there should also be an increase in financial education to raise further awareness about the financial services, the good, the bad and the ugly, including frauds and other related financial crimes. Consumers need to be educated about the benefits of technology for financial inclusion and how to stay safe when using those technologies due to fraudulent activities of cybercriminals. This measure will undoubtedly increase consumers' confidence in fintech companies and their services. Since fintech companies deal with collecting, processing and storing personal data, including consumers' biometric information, people are concerned about the safety of such data. Given Nigeria's challenging institutional context, there is a high tendency for personal data to be breached because of the lack of adequate regulations protecting these data, thus making individuals more vulnerable to the activities of cybercriminals. Therefore, the Nigerian government must enact a comprehensive law on data protection, which will, amongst other things, mandate fintech companies and other data handlers/controllers to safeguard the privacy/data of their clients.

6. BROADER LESSONS ARISING FROM THE NIGERIA CASE STUDY FOR THE DEVELOPING AND EMERGING MARKETS

The insights and lessons learned from using Nigeria as a case study in this research cast light on the valuable role of fintech in driving financial inclusion in countries in developing and emerging markets, particularly those with challenging institutional contexts. Financial inclusion is essential in addressing the current worldwide issues stated in the SDGs, particularly regarding poverty alleviation by 2030. Accessibility to financial services, primarily through fintech, is one way to reduce life challenges, including poverty, sickness, crime and illiteracy (U.N. SDGs, 2015).[1] People excluded from financial services lack the tools to prepare for and reduce such risks. For example, farmers with no access to digital payment services worry about theft and may spend all their money immediately instead of being robbed of their hard-earned money. Savings can fund children's education and set a person up for old age, and these are long-term goals that are favourable to everyone. The financially excluded are forced to act unsustainably, as they do not have access to financial systems that can help them think and plan for the long term.

[1] These are listed as key challenges in the United Nations Sustainable Development Goals, 2015 https://www.un.org/sustainabledevelopment.

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Furthermore, through the prioritisation and execution of approaches focusing on the advancement of the financial sector by emphasising factors like financial inclusion, the general volume of financial assets can be increased. New cash can be gotten and made accessible, especially in developing and emerging economies, by activating fast financial change and digitisation (Zhong and Yoong, 2021). Fintech is a key to a pervasive achievement of financial inclusion; however, as previously stated, around 1.7 billion people globally lack access to financial services and systems, most of whom are domiciled in developing and emerging markets. For fintech to have a meaningful impact through better reach, general accessibility is an obstruction that needs to be overcome. Having financial services at reasonable rates will be fundamental for realising the U.N. SDG 2030 by first considering the management of financial obligations, reducing poverty, and encouraging better economic development. Countries in developing and emerging markets are in better positions to achieve financial inclusion through fintech if they remove the barriers that limit access to financial services, as this will accelerate their chance of attaining the U.N. SDG 2030.

7. CONCLUSIONS

From the discussion in this paper, it is undoubtedly apparent that several Nigerian adult populations remain financially excluded; the majority do not have bank accounts and do not have access to financial services. Although banks have not been established in most rural areas, fintech can provide an opportunity to close the financial gap by reducing the cost of providing financial services. With a suitable environment and supporting regulations, fintech can become one of the most innovative tools to increase financial inclusion in Nigeria and other developing and emerging countries with challenging institutional contexts. There is worldwide agreement on the importance of financial inclusion due to its central role in bringing financial stability and economic development. Financial inclusion through fintech can improve financial stability and economic growth, which is what Nigeria, a developing and emerging market, requires to meet U.N. SDG 2030.

Though fintech seems like a viable means of financial inclusion in Nigeria, the use of mainstream financial institutions to achieve a Nigeria with a high level of banked adults remains low because of the lack of trust in those institutions and other challenges mentioned above. Therefore, future studies exploring specific variables of financial inclusion would explore the extent to which the issue of gender diversity, particularly how it relates to how

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women use fintech services provided by banking and other fintech companies. This is because there is a dearth of empirical research on gender financial inclusion in developing and emerging markets. Such studies would examine women's attitudes and expectations towards services provided by fintech companies and banks. Furthermore, future studies are also needed to explore ways governments and fintech companies can partner with microfinance institutions in driving financial inclusion in rural communities, as most unbanked people in developing and emerging markets are domiciled in rural areas.

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References

Adalessossi, K., Kaya, N. (2015). The measure of the financial inclusion in the African countries. Advances in Management and Applied Economics, 5(5), 23.

Adeola, O., Evans, O., (2017) "Financial inclusion, financial development, and economic diversification in Nigeria," Journal of Developing Areas, Tennessee State University, College of Business, vol. 51(3), pp1-15.

Aduda, J., Kalunda, E. (2012) 'Financial inclusion and financial sector stability with reference to Kenya: A review of literature.' Journal of Applied Finance and Banking, 2(6), 95.

Amidžić G, Massara A, Mialou A (2014) Assessing countries' Financial inclusion standing—a new composite index. IMF Working Paper 14/36. Washington, DC, available at: https://www.imf.org/external/pubs/ft/wp/2014/wp1436.pdf

Ardic, O., P., Heimann, M., Mylenko, N., (2011) Access to Financial Services and the Financial Inclusion Agenda around the World: A Cross-Country Analysis with a New Data Set. Policy Research working paper; no. WPS 5537. World Bank, available at: https://openknowledge.worldbank.org/bitstream/handle/10986/3310/WPS5537.pdf?sequence=1&isAllowed=y

Arner, D. W., Buckley, R. P., Dirk, A., Veidt, R., (2019) 'Sustainability, Fintech And Financial Inclusion,' European Banking Institute Working Paper Series Paper number 2019/41, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3387359

Arner, D. W., Barberis, J., and Buckley, R. P. (2017) Fintech and Regtech in a nutshell, and the future in a sandbox. *Research Foundation Briefs* Vol 3(4): pp.1–20.

Ayyagari, M., Beck, T. (2015) 'Financial inclusion in Asia: An overview.' Asian Development Bank Economics Working Paper Series, (449).

Bakare, A., (2021) 'Cryptocurrency Trading: CBN Orders Banks To Close Operating Accounts.' CBN UPDATES Vol. 3 No. 2 February 2021

Bayero, M., A., (2015) 'Effects of Cashless Economy Policy on financial inclusion in Nigeria: An exploratory study, Procedia-Social and Behavioral Sciences 172 pp.49-56.

Bofondi, M., Gobbi, G., (2017) The big Promise of Fintech, European Economy Banks, Regulation, and The Real Sector, Issue 2, available at: https://european-economy.eu/book/fintech-and-banks-friends-or-foes/

Brown, T. J., Dacin, P. A., (1997). The company and the product: Corporate associations and consumer product responses, Journal of Marketing, 61(1), pp.68–84

Nwanisobi, O., (2021)' Response to Regulatory Directive on Cryptocurrencies.' CBN Press Release, 7 February 2021, available, https://www.cbn.gov.ng/out/2021/ccd/cbn%20press%20release%20crypto%2007022021.pdf

Chikalipah, S. (2017) 'What determines financial inclusion in Sub-Saharan Africa?' African Journal of Economic and Management Studies.

Chima, O., R., (2011) 'The Democratisation Of Finance?: Financial Inclusion And Subprime in the U.K. And U.S.' (PhD thesis Northumbria University).

Čihák, M., Mare, D., S., Melecky, M., (2021) 'Financial Inclusion and Stability: Review of Theoretical and Empirical Links.' World Bank Research Observer, Volume 36, Issue 2, pp.197–233, https://doi.org/10.1093/wbro/lkaa006

Corrado, G., Corrado, L. (2015) The geography of financial inclusion across Europe during the global crisis. Journal of Economic Geography, 15(5), 1055-1083.

Demirguc-Kunt, A., Klapper, L., (2012), "Measuring Financial Inclusion, the Global Findex Database," The World Bank.

EFInA (2021) 'Access to Financial Services in Nigeria 2020 Survey, Enhancing Financial Innovation and access, available at: https://a2f.ng/wp-content/uploads/2021/06/A2F-2020-Final-Report.pdf

European Commission. (2008). Financial services provision and prevention of financial exclusion. Report by the Director-General for Employment, Social Affairs and Equal Opportunities, European Commission.

Fungáčová, Z., Weill, L. (2015) 'Understanding financial inclusion in China.' China Economic Review, 34, 196-206.

Gardeva, A., (2010) A Vision for Full Financial Inclusion, Centre for Financial Inclusion, available at: https://www.centerforfinancialinclusion.org/a-vision-for-full-financial-inclusion

Girón, A., Kazemikhasragh, A., Cicchiello, A. F., Panetti, E. (2021) 'Financial Inclusion Measurement in the Least Developed Countries in Asia and Africa.' Journal of the Knowledge Economy, 1-14.

Giwa-Osagie, O., Osiobe, I., (2021) 'How Fintech Can Stimulate Financial Inclusion: Challenges And Opportunities, available at: https://www.giwa-osagie.com/how-fintech-can-stimulate-financial-inclusion-challenges-and-opportunities/

Gomber, P., Koch, J. A., Siering, M., (2017) 'Digital Finance and Fintech: Current research and future research directions, Vol 87 (5) Journal of Business Economics pp.537-550.

Grazioli, R., Milioli, M. A., Notte, A., Poletti, L.(2021) Financial and social inclusion in Europe, EIF Working Paper, No. 2021/72 < https://www.econstor.eu/bitstream/10419/232575/1/1752696492.pdf>

Harlem, S., (2021) An Appraisal of The Regulatory Framework of Fintech in Nigeria' available at: https://www.harlemsolicitors.com/2021/03/19/an-appraisal-of-the-regulatory-framework-for-fintech-in-nigeria/

H.M. Treasury, (2004). Promoting Financial Inclusion. HMSO, St Clements House, 2-16 Colegate, Norwich, December 2004

Huang, R., Kale, S., Paramati, S. R., Taghizadeh-Hesary, F. (2021) 'The nexus between financial inclusion and economic development: Comparison of old and new E.U. member countries.' Economic Analysis and Policy, 69, 1-15.

Hung, J. L., Luo, B., (2016) Fintech in Taiwan: A case study of a Bank's strategic planning for

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

an investment in a Fintech company, Financial Innovation 2 (1) 15.

Iman, N., (2020) 'The rise and rise of financial technology: The good, the bad, and the verdict' 7 (1) Cogent Business & Management, 1,3,

Kama, U., Adigun, M., (2013) 'Financial Inclusion In Nigeria: Issues And Challenges,' CBN Occasional Paper No.45 available at:< https://www.cbn.gov.ng/Out/2014/RSD/Occasional%20Paper%20No.%2045%20Issues%20and%20Challenges.pdf>

Kempson, E., Collard, S. (2012) 'Developing a vision for financial inclusion.' Bristol, University of Bristol for Friends Provident Foundation.

Khanna, T., Palepu, K. (1997) 'Why focused strategies may be wrong for emerging Markets' *Harvard business review*, *75*(4), 41-51.

Leong, K., Sung, A., (2018) 2018) Fintech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way? International Journal of Innovation, Management and Technology, 9 (2). pp. 74-78.

Leyshon, A., Thrift, N., (1996) 'Financial Exclusion and the Shifting Boundaries of the Financial System', *Environment and Planning A: Economy and Space*, 28(7), pp. 1150–1156. doi: 10.1068/a281150.

Lockton, D., Harrison, D., Stanton, N. A., (2010) The design with intent method: A design tool for influencing user behaviour. *Applied Ergonomics* Vol 41(3): pp.382–392.

Mani, M. (2019) 'Financial Inclusion in North India: Status and Insights.' IUP Journal of Bank Management, 18(1), 27-48.

Marshall, J. N. (2004) 'Financial institutions in disadvantaged areas: a comparative analysis of policies encouraging financial inclusion in Britain and the United States.' Environment and Planning A, 36(2), 241-261.

Mbutor, M. O., Uba, I., A., (2013). 'The impact of financial inclusion on monetary policy in Nigeria,' Journal of Economics and International Finance, Vol 5(8) pp.318-326.

Mention, A.,, (2019) 'The Future of Fintech,' Research-Technology Management Vol 62(4) pp.59-63

Mirjam, J., (2021) 'Evolution of Fintech' ZIGURAT Innovation & Technology Business School, available at: https://www.e-zigurat.com/innovation-school/blog/evolution-of-fintech/

Mohan, R., (2006) 'Economic growth, Financial Deepening and Financial Inclusion' Address at the Annual Bankers' Conference 2006, Hyderabad, available at: https://www.bis.org/review/r061121e.pdf>

Mwega, F.M. (2014). Financial regulation in Kenya: balancing inclusive growth with financial stability. ODI Working paper 407

Nanziri, E. L. (2016) 'Financial inclusion and welfare in South Africa: Is there a gender gap? *Journal of African Development*, *18*(2), 109-134.

Ng, A. W., Kwok, B., K., B., (2017) Emergence of Fintech and cybersecurity in a global financial centre: Strategic approach by a regulator, Journal of Financial Regulation and Compliance, Vol. 25 No. 4, pp. 422-434. https://doi.org/10.1108/JFRC-01-2017-0013

Odior, E. S., & Banuso, F. B., (2012) 'Cashless banking in Nigeria: Challenges, benefits and policy implications.' European Scientific Journal, Vol 8 (12)

Ohnesorge, J., K., (2007) Developing development theory: Law and development orthodoxies and the Northeast Asian experience. University of Pennsylvania Journal of International Economic Law, 28, pp. 219–308.

Technological Sustainability

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Olowookere, D., (2019) 'Role of Fintech in Accelerating Financial Inclusion in Nigeria |' *Business Post Nigeria*, available at: https://businesspost.ng/featureoped/role-of-fintech-in-accelerating-financial-inclusion-in-nigeria/

Osiki, A., (2020) 'Esusu cooperative' as a means of extending social protection to the Nigerian informal economy.' Journal of the Academy of Social Sciences Volume 15 (4) pp. 461-475

Ozili, P. K. (2018) 'Impact of digital finance on financial inclusion and stability.' Borsa Istanbul Review, 18(4), 329-340.

Ozili, P. K. (2020) 'Financial inclusion research around the world: A review.' Forum for Social Economics, 50:4, 457-479, https://doi.org/10.1080/07360932.2020.1715238

Park, C. and Mercado, R. (2018), 'Financial inclusion: new measurement and cross country impact assessment,' The South East Asian Central Banks (SEACEN) Research and Training Centre, Working Paper no.29.

Puschmann, T., (2017) 'Fintech' 59 (1) Business & Information Systems Engineering.

Ratnawati, K., (2020) 'The Impact of Financial Inclusion on Economic Growth, Poverty, Income Inequality, and Financial Stability in Asia,' *The Journal of Asian Finance, Economics and Business*. Korea Distribution Science Association, 7(10), pp. 73–85

Sahay, R., Cihak, M., N'Diaye, P., M., Barajas, A., Mitra, S., Kyobe, A., Mooi, Y., N., Youse, S., R., (2015) Financial inclusion: can it meet multiple macroeconomic goals? IMF Sta Discussion Notes 15/17, International Monetary Fund

Sahoo, A. K., Pradhan, B. B., Sahu, N. C. (2017) 'Determinants of financial inclusion in tribal districts of Odisha: An empirical investigation.' Social Change, 47(1), 45-64.

Sanusi, L., S., (2011), Financial Inclusion for Accelerated Micro, Small and Medium Enterprises Development: The Nigerian Perspective, A Paper presented at the 5th Annual Microfinance and Entrepreneurship Awards 2011

Sarma, M, Pais J (2011) Financial inclusion and development, Journal of International Development, Vol 23(5) 613,628

Scott, R., W., (2004) Institutional Theory: Contributing to a Theoretical Research Program,' In K. G. Smith, & M. A. Hitt, (Eds.), Great minds in management: The process of theory development (pp. 460-484). Oxford: Oxford University Press.

SEC, (2021) 'Proliferation of Unregistered Online Investment and Trading Platforms Facilitating Access to Trading in Securities Listed in Foreign Markets.' Available at: https://sec.gov.ng/proliferation-of-unregistered-online-investment-and-trading-platforms-facilitating-access-to-trading-in-securities-listed-in-foreign-markets/

Sharma, D. (2016) 'Nexus between financial inclusion and economic growth: Evidence from the emerging Indian economy.' Journal of financial economic policy.

Sultanov, A., Shakhidi, F., (2021) 'Financial Inclusion is a Human Right. Policy Must Reflect That.' Newsweek, 28 May 2021, available at: https://www.newsweek.com/financial-inclusion-human-right-policy-must-reflect-that-opinion-1595606

Tebaldi, E., Mohan, R. (2010). Institutions and poverty. The journal of development studies, 46(6), 1047-1066.

The Global Findex Database 2014 Measuring Financial Inclusion around the World, available

Technological Sustainability

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

at: http://documents.worldbank.org/curated/en/187761468179367706/pdf/WPS7255.pdf#page=3

Thiel, M., (2001) Finance and economic growth - a review of theory and the available evidence. European Economy - Economic Papers 2008 - 2015 158, Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Tsai, C. H., Kuan-Jung, P. (2017) 'The Fintech revolution and financial regulation: The case of online supply-chain financing.' Asian Journal of Law and Society, 4(1), 109-132.

Ulwodi, D. W., Muriu, P. W. (2017) 'Barriers of financial inclusion in Sub-Saharan Africa.' Journal of Economics and Sustainable Development, 8(14).

United Nations Reports (2005) 'Building Inclusive Financial Sectors for Development: Widening Access, Enhancing Growth, Alleviating Poverty.' available at: https://www.un.org/esa/ffd/wp-content/uploads/2014/10/se-msc2005-Report-WBI.pdf

United Nations Sustainable Development Goals 2015, available at:<https://sdgs.un.org/goals>

Ventura, L., (2021) 'World's Most Unbanked Countries 2021' Global Finance 17 February 2021, available at: https://www.gfmag.com/global-data/economic-data/worlds-most-unbanked-countries

Wayne, T., Soetan, T., Bajepade, G., Mogaji, E., (2020) Technologies for Financial Inclusion in Nigeria. Research Agenda Working Papers. Vol 2020 No 4 pp 40-56.

World Bank, (2008). Finance for All – Policy and Pitfalls in Expanding Access. The World Bank, Washington, D.C.

Zetzsche, D. A., Buckley, R. P., Arner, D. W., Barberis, J. N., (2017) 'Regulating a revolution: From regulatory sandboxes to smart regulation,' Fordham Journal of Corporate and Financial Law 23: 31.

Zhang, Q., Posso, A. (2019) 'Thinking inside the box: A closer look at financial inclusion and household income.' The Journal of Development Studies, 55(7), 1616-1631.

Zhong, E., Yoong, R., (2021) 'Fintech In Responsible Financing | Responsible Business' available at: https://www.responsiblebusiness.com/channels/sustainable-finance-news/fintech-in-responsible-financing/

Zins, A., Weill, L. (2016) 'The determinants of financial inclusion in Africa.' *Review of development finance*, *6*(1), 46-57.

Technological Sustainability