**FINANCIAL TECHNOLOGY INVESTMENT AND POVERTY REDUCTION IN NIGERIA**

**BY**

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**(20PGDA000110)**

**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ACCOUNTING AND FINANCE**

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**DECLARATION**

I, **Erondu Ihunanya Ngozi** a ***Master’s degree*** student in the ***Department of Accounting and Finance***, Landmark University, Omu-Aran, hereby declare that this dissertation entitled “***Financial Technology Investment and Poverty Reduction in Nigeria***”, submitted by me is based on my original work. Any material(s) obtained from other sources or work done by any other persons or institutions have been duly acknowledged.

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**CERTIFICATION**

We certify that this dissertation titled ‘Financial Technology Investment and Poverty Reduction in Nigeria’ is an original work carried out by Erondu Ihunanya Ngozi (20PGDA000110) in the Department of Accounting and Finance, College of Business and Social Sciences, Landmark University, Omu-Aran, Kwara State, under the supervision of Dr. J.N.Taiwo and Dr. A. Otekunrin. We have examined and found this work acceptable as part of the requirements for the Award of Master of Science degree in Banking and Finance.

**Dr. J.N. Taiwo**

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 **DEDICATION**

This study is dedicated to the Almighty God. He has been my source of inspiration and my divine director all through this study.

Also, I am dedicating this study to my loving and altruistic parents, Prof. Ebere Erondu and Dr. (Mrs.) Chinyere Erondu, for their sacrifices, undying love, prayers, and constant support. I pray that God grants them the righteous desires of their heart even as they live long to savour the fruits of their labour.

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**ABSTRACT**

*The study investigated financial technology investment and poverty reduction in Nigeria spanning from the year 1981 to 2020. In other to determine the kind of relationship that occurs between the variables of the study, secondary data sourced from Central bank of Nigeria Statistical Bulletin was employed.*

*The study employed public sector investment in financial technology and private sector investment in financial technology as proxies for financial technology investments, while Human Development Index was adopted as a metric for poverty reduction. However, the study adopted ex post-facto research design. The descriptive test, normality test, test for outliers and unit root test to establish the stationarity of data were carried out. The Cointegration method was adopted to test the hypotheses using the e-views 9 statistical software.*

*The study showed that only public sector investment in financial technology impacted negatively and significantly on poverty reduction which was measured by Human Development Index in Nigeria. While, private sector investments in financial technology was a positive and a significant determinant of Human Development Index. This implies that an increase in financial technology investments, will lead to an increase in poverty reduction in Nigeria Therefore, the study concludes that the impact of financial technology investment on poverty reduction is positive and significant.*

*Therefore, the study recommends that government should spend more in developing efficient financial technology framework, so that it can significantly reduce poverty in Nigeria by incorporating financial technology into their poverty intervention programs, as it helps to reduce poverty. Also, the government should enact policies that will encourage private sector investment in financial technology and provide funding for FinTech start-ups, as this will allow citizens to benefit from lower costs while capitalizing on perceived positive gains from private sector investments in financial technology.*

# CHAPTER ONE

##  INTRODUCTION

## 1.1 Background to the Study

 "Financial technology" is a phrase that combines the concepts "financial" and "technology (FinTech)." It pertains to using advanced technologies to provide range of financial services to consumers. It includes banking, insurance, investments, or anything else related to finance. According to Ozili (2018), "Fintech" stands for "financial technology," he alludes that it is the distribution of banking as well as financial services via advanced technological innovation guided by computer programs and algorithms. Whilst, it’s a fairly novel word, FinTech is really not novel since it has been around for a long time; the financial sector has persistently been influenced by technology. Nevertheless, thanks to the internet and the prevalent use of devices like mobile phones and tablets, the rapid change has amplified vividly currently.

Financial Technology is transforming the financial world for consumers in different manners for example, rather than going to a bank, one can now secure a bank account online. Therefore, an account can be linked to a smartphone and used to track transactions. In addition, the smartphone may be converted into a "digital wallet" as well as used to make payment for items with the use of cash in the account. According to Arneris, Barberis, and Ross (2016), every one of those three and a half periods experienced major market distinctions, resulting in transformation in the way people have to deal with their cash.

According to Achugamonu, Alexander, Obindah, Arewa, and Okoye (2020), In decades past, technology has been a critical factor in the transformation of the financial sector, beginning with the invention of the first financial technology known as credit cards to reduce bulk cash carriage and the introduction of automated teller machines (ATMs), which greatly reduced the number of bank tellers and supported bank branches in the 1960s. Furthermore, throughout the 1970s, electronic stock trading took off not just on exchange trading floors but also on the web, followed by electronic-commerce business models that emerged during the 1990s.

With emerging focus in cryptocurrencies and blockchain, wealth-tech, and cybersecurity, the variety of fintech solutions receiving investment has continued to broaden and develop. The presence of a strong sense of renewal, with multiple trends is driving both large businesses and start-ups to redefine what financial services signifies and what it might likely look like in the post-pandemic world, such as fintech's expanding reach into the world's most remote and underserved regions, like Africa, Southeast Asia, and Latin America (KMPG, 2022). Fintech has taken root in places ranging from large developing markets to small municipalities in the United States and Europe throughout the epidemic. Fintech innovators are not limited to traditional financial services centres or well-established technology clusters. A city like Tokyo, known for both, did not reach the top 10, while Dubai was not among the top 50 global fintech centres. Neither has moved significantly in the last year (Findexable, 2021). Saudi Arabia, Turkey, Indonesia, Brazil, and China, on the other hand, were among the FinTech industry's fastest-growing countries in 2021. High smartphone usage and restricted financial access are common in emerging FinTech economies, allowing for the flow of fintech concepts between continents and nations (Findexable, 2021).

FinTech start-ups continue to outperform all other start-ups in Africa when it comes to raising money. Opay, they received $400m in Series C investment, Flutterwave, also received $170m in a Series C round, and TymeBank, received $180m in a Series B round, were among the biggest recipients of the fintech cash. MFS Africa, a digital payments gateway, raised $100 million, while Jumo and MNT Halan both raised $120 million. This came after Zepz (previously WorldRemit) secured $292 million in Series E funding, with Chipper Cash raising $250 million, Tala $145 million, and Wave raising $200 million (Njanja, 2022). And, given the incremental investment for African FinTechs throughout the years, cash put into these start-ups is definitely set to increase as mobile phone as well as internet adoption grows (Njanja, 2022).

Nigeria as Africa's most densely populated nation, has the region's highest GDP (OECD, 2021). As well, it has a solid Fintech environment and is a trailblazer on the globe in terms of start-ups and digital services from traditional institutions. With the bulk of businesses first concentrating on payment processing, Fintech proceeds are projected to reach $543 million by 2022, motivated by increased mobile phone usage besides the financially excluded populace (Economist Intelligence Unit, 2020). The Nigerian FinTech sector is developing as more firms use technology to improve the way the financial industry functions. According to National Bureau of Statistics data (2018), 87 million transactions valued at $5 billion were done using mobile banking systems in 2018, a growth of 82% over the preceding year. This rise in the usage of smart phones, which has transformed customer behaviour and prioritized simplicity and accessibility, has aided the expansion of the local FinTech business. With 162 million mobile customers in 2017, Nigeria is the largest mobile market in Africa. The widespread acceptance of FinTech and the answers it delivers keeps the industry appealing to investors (McKinsey, 2020).

 Over 200 FinTechs are now functioning in Nigeria, with investments totalling $560 million USD over the last several years. These companies provide a variety of services, including payments, loans, savings, and insurance. FinTechs contributed for 10% of direct investment into Nigeria from 2017 to 2019 and potentially contribute up to $3 billion in pre-COVID-19 estimations (EFinA2020). FinTechs might generate up to $3 billion in economic investment and $1 billion in new income to the financial services industry in the long run (EFinA2020). Growing smartphone and mobile technology penetration, combined with a combination of unmet needs, has created the potential for Fintechs to start driving financial inclusion, which seems to be a strategy for promoting inclusive economic growth, reducing inequality, abolishing systemic poverty, and working to improve communal welfare.

The Central Bank of Nigeria, launched the financial inclusion plan in 2010, having the intent of continuing to pursue mobile payment technologies and other cashless policies to lower the cost and accessibility of financial services and transactions. Implementing credit improvement schemes and initiatives to boost micro, small, and medium-sized companies (MSMEs) is another approach (CBN, 2010).

The potential of financial technology can enable accelerated speed in achieving this aim. According to Vijaya, Obado-Joel, Fatai, Masood, and Omakwu (2019), Nigeria's tech sector is expanding rapidly: more than 58 percent of enterprises in their study developed new goods and services in the previous year. A new or better version of an existing product or service was introduced by 52 percent of the companies surveyed. Financial advancements in technology, according to Onuoha, Peregrino, and Isiavwe (2019), have the potential to boost aggregate expenditure and thus improve gross domestic product levels by proffering greater means of entry to a broad diversity of financial services as well as products for household members and corporate entities. They contributed to the general agreement that the endorsement of electronic online banking has enhanced Nigeria's financial inclusion efforts. Nigeria's technical boom burgeoned just several months following the conception of the National Information Technology Development Agency (NITDA), when the Olusegun Obasanjo-led administration introduced the Global Systems for Mobile Communications System (GSM) in 2001. Nigeria's overall population exposure to mobile phones and use of the web is estimated to be over one hundred (100) million people, up from roughly fifty (50) million people in just two decades (Internet World Stats,2019). The integration of cellular phones and cyberspace access and industrialization and population growth have as well as industrialization and growth of the populace, created a situation favourable to technological services and products.

Promoting Financial Technology solutions drives worldwide innovation in financial services, altering the nature of commerce and end-user expectations, (Mckinsey, 2020). It represents a significant potential to construct a more inclusive economic recovery by reaching out to disadvantaged groups and communities, particularly the poor, and thereby assisting in poverty alleviation. As a result, financial technology assists in the acceleration of current countries' digitization, which is a viable platform for addressing payment shortfall, mobilizing capital for equitable and effective intermediation, and guaranteeing a long-term route to economic recovery (Heng, Ivanova, Mariscal, Ramakrishnan, & Wong, 2016).

FinTech also contributes to the promotion of growth and the prevention of growth volatility, as well as alleviating poverty, via enhancing integration and inclusivity of finance (Berkmen et al., 2019). As a result, growth in FinTech potentially allows for poverty eradication to be more feasible. According to Ho and Iyke, one of the greatest issues affecting mankind in the twenty-first century is poverty (2018). Accordingly, a deficiency in financial assets may result in sickness, the creation of harmful social groupings, and a lack of leisure activities, stigmatization, low quality of living, economic troubles, and a bad diet. Therefore, governments, scholars, and international establishments like the United Nations along with the World Bank continue to prioritize eradicating poverty in all of its manifestations (Ho & Iyke, 2018). In a nutshell, non-existence of access to finance and support services may result in a failure to secure basic necessities, resulting in poverty (Gursida, 2017).

Financial technology is also noted to be powered by artificial technology as companies and end users are reported to be creating large amount of data unprecedentedly. Davide and Georges (2019) pinpointed that the amount of digital data created in the year 2017 was eight times higher than that of 2009 and that breakthrough in telecommunications networks, the Internet of Things (IOT) implementation as well as the expected extensive implementation of 5G networks will likely empower increased statistics collection. According to the International Financial Corporation (2019), internet data traffic will treble by 2022, and the percentage of certified internet of things (IoT) gadgets will increase from 13% in 2018 to 28% in 2025. These recent developments are expected to accelerate the development of more complex financial innovations.

 The call for inclusive growth by policy makers globally, researchers such as Campbell (2017), highlighted this fact by postulating that inclusive growth ensures that economic growth benefits all segments of the society, be it the “haves or the have not’s”. Coccai (2019) did not deviate, stating that economic development is a continuous process of abnormal system expansion. He bolstered his case by stating that development is a multifaceted progression that creates fiscal, technical, social, and organizational transformation to support nations' riches and the overall well-being of individuals in society. This is what financial technology can enable if properly invested in.

Emefiele ( 2021), the former Nigerian Central Bank Governor projected that financial technology can induce an additional 10 percent to 12 percent GDP growth rate to the economy, create three (3) million new jobs, financially include forty-six (46) million adults by 2025, increase credit to small and medium scale enterprises, and a surge of public sector savings of up to Two (2) billion USD; standing on the shoulders of Mckinsey’s report in 2016, that digitalized finance is likely to intensify the yearly GDP of all growing economies by $3.7 trillion in 2025. Going by this, capital accumulation will be a supporting benefit given that the welfare of citizens will be triggered leading to economic development and poverty reduction.

## 1.2 Statement of the Problem

Poverty is so vital so it represents the number one Sustainable Development Goal (SDG) that strives to exterminate poverty in every dimension by 2030. Poverty is an intricate and dynamic issue that is one of the most serious development issues (Ogunniyi, Oluseyi, Adeyemi, Kabir., & Philips., (2017), Oluwatayo, (2014). Omobowale (2014), alludes that poverty entails a condition in which persons are stripped of the enjoyable elements of society as well as the prospect to realize the desired standard of living and a publicly appropriate living standard. In remote regions, about 80% of the populace, or a major segment of the populace, lives in poverty, with few societal as well as infrastructural services (Ogundipe et al., 2019, Aderounmu, 2018).

Globally, 767 million people lived in severe poverty in 2015 with the figure expected to fall to lower than 600 million by year 2019 (Kharas et al., 2018). Over a billion individuals throughout the world dwell in demeaning and filthy situations that lead to starvation, sickness, despair, and dilapidation (UNDP, 2016).

 Despite its vast people, agricultural, petroleum, gas, and large undeveloped solid mineral and other natural resources, Nigeria in particular is prone to poverty. According to the World Poverty Clock (2018), about 86.9 million Nigerian citizens expend lower than $1.90 USD each day in 2018, and by February 2019, an additional 3 million individuals had become poor, totalling over 91 million Nigerians who are extremely poor. Nigeria is seen to possess the highest number of people that are severely poor (86.9 percent), as against Tanzania, Kenya, South Africa, and Zambia, with 19.9 million, 14.7 million, 13.8 million, and 9.5 million persons living in extreme poverty, respectively.

Hofer, Hamel, and Kharas (2018), allude that Nigeria is amongst the underprivileged countries in worldwide, surpassing India. Before Nigeria gained independence in 1960, the degree of poverty was quite small. However, sixty years after achieving independence, Nigeria moved from a moderate poverty threshold to being one of the world's poorest nations today. In order to reduce poverty in the country, the Nigerian government has developed several economic policies, including fiscal policies, monetary policies, industrial policies, and even trade policies. Despite steps started by succeeding administrations to eliminate poverty since 1980, Nigeria was unsuccessful in meeting the Millennium Development Goals (MDGs) poverty objectives by 2015. Whatever efforts previous administrations, both democratic and military, have made to exterminate poverty have proven futile. Consequently, despite all efforts, poverty prevails as a key deterrent to Nigeria's socioeconomic progress (Danaan, 2018). The purpose is to identify strategies to eliminate poverty in the country, which needs thought.

Being the first of the Sustainable Development Goals (SDGs), eradicating poverty is unquestionably a matter of priority for everyone all through the world, including academics. Financial development, without a question, is crucial to poverty alleviation. It is proposed that by resolving financial market flaws such as asymmetric information and excessive borrowing costs, the poor will have a greater chance of obtaining loans (Appiah-Otoo & Song, 2021).

As a result, the existing research is mainly centred on financial development and how it enhances poverty reduction. Trade openness was recognized as a strategy of decreasing poverty by Cain, Hasan, and Mitra (2010) and Basanta and Malvika (2014). This research, however, focuses on the effect of financial technology investments in reducing poverty and improving poor people's access to finance.

Financial technology is very transformative in that it may drastically alter the pricing or availability of products or services, or it can substantially alter how we obtain data, manufacture things, or engage with consumers. As modernization barriers become increasingly intertwined with technological variations, the dual objectives of eradicating poverty and boosting shared prosperity become increasingly reliant on capitalizing on investment opportunities in financial technologies, thereby facilitating economic development and reducing poverty. Notwithstanding the apparent benefits of financial technology, investment in the industry has been dominated by foreign private investors, depriving the sector of money needed to fully achieve its promise of helping the underbanked and unbanked populations. (McKinsey & Company, 2020).

There is also a paucity of literature in the study of the financial technology framework (Mercurius, Steph and Fangky, 2020). There is a greater scarcity of research on its investment potentials as they relate to poverty, as most of the few works done have been on financial technology and economic growth as a standalone, and have mostly been presented qualitatively, with conceptualization and contextualization remaining a focus. This project will fill a knowledge gap by looking at the main reasons and solutions for reaching the SDG of poverty reduction in Nigeria through quantitative analysis of financial technology investments, particularly from the public sector.

## 1.3. Research Questions

1. To what extent does public sector investment in Financial Technology affect the human development index in Nigeria?
2. To what extent does Private sector investment in Financial Technology affect the human development index in Nigeria?

## 1.4. Objectives of the Study

The main objective of the study is to examine the effect of financial technology investment on poverty reduction in Nigeria. While the specific objectives of the study are to;

1. Determine the effect of Public Sector Financial Technology Investment on Human Development Index in Nigeria.
2. Examine the effect of Private Sector Financial Technology on Human Development Index in Nigeria.

## 1.5. Research Hypotheses

The main and specific objectives of this study have been specified under the research question section. The associated research hypotheses are following:

Ho1: There is no significant relationship between Public Sector Investment in Financial Technology (PUSIFT) and Human Development Index (HDI) in Nigeria.

Ho2: There is no significant relationship between Private Sector Investment in Financial Technology (PRSIFT) and Human Development Index (HDI) in Nigeria.

## 1.6. Justification for the Study

This research will give baseline information on how financial technology investments can affect poverty reduction. The research will also provide unique perspectives into the disruptive trends of financial technology as well as its investment potentials which will help in the formulation of policies that will enhance poverty reduction strides in Nigeria. Through the examination of Nigeria’s investment in financial technology infrastructure, the study will specifically look beyond growth trends to highlight the developmental impacts with such indicator as human development index.

While government awareness of the need and importance of financial technology is rising, the mechanism for how to utilize it effectively is important, it will be beneficial to the government in providing policies that will help elevate the investments in financial technology and how those policies can be good for a country like Nigeria in alleviating poverty.

**1.7 Scope of the Study**

 This research is focused on financial technology investment and poverty reduction in Nigeria. To achieve the research objective, attention will be placed on the financial technology framework and its investment potentials, with an empirical inquiry into its poverty reduction benefits in Nigeria. Because of the intertwined nature of financial technology with digital finance and electronic finance, the concepts will align itself with all aspects of technology such as artificial intelligence, robotics, mobile banking, etc, despite having financial technology as its core mandate and will use data from the statistical bulletin of Nigeria’s Central Bank 2020.

Geographical Scope: This research dwells on financial technology investment and poverty reduction activities within the Nigerian geography.

## 1.8 Significance of the Study

This exploration has an importance, that is encompassing as it will solve a lot if micro economic problems, including reducing poverty and inequality in the country. Hence, the study will be beneficial to the Government in providing policies that will help reduce poverty in the country. It will also benefit law makers in providing proper laws around their constituencies in order to improve Financial Technology standards.

Non-Governmental Organization (NGOs) too will benefit from the findings of this study as information to guide them on the focus of their intervention mandates of poverty reduction. The general public will have access to valued information that will create awareness of financial technology, thereby giving them access to needed funds and making them less susceptible to poverty.

Financial technology investment research will also provide the much-needed literature for scholars from a wide range of fields’ asides the finance, business and economics endeavour. Academic researchers will leverage on this research to make reference and carryout future academic and scientific researches. To the general public this work will contribute to the financial literacy efforts of government as it will provide valued information that will create awareness of financial technology, thereby leading to adoption and acceptance amongst those who otherwise would be less adaptive to technological changes due to ignorance.

## 1.9 Outline of the study

This research is divided into five chapters. Chapter one has do with the study's introduction, which provides an overview of the subject matter. This chapter describes the intended direction of the study and includes topics such as the overview, problem statement, objectives, hypotheses, justification, scope, and organization of the study. The second chapter theorized and conceptualized the topic while also reviewing empirical literature on financial technology investments and poverty reduction. Chapter three describes the methodology used for empirical analysis; chapter four is the main part of the study and deals with the presentation and analysis of the study's data. The fifth chapter discusses the findings, conclusions, and recommendations.

**CHAPTER TWO**

## REVIEW OF LITERATURE

**Introduction**

## This study examined studies conducted by diverse scholars that were relevant to the study's conceptual, theoretical, and empirical aspects.

## 2.1 Conceptual Review

### 2.1.1 Financial Technology

The term "FinTech" is merely an amalgam of the terms "financial" with "technology." It is veiled in sensationalism and clouded by jargon. It describes how technology is often used to furnish customers with financial services and goods. Banking, insurance, investment, and other financial services may be included. (Eurosystem, 2014).

According to Arner, Barberis and Buckley, (2015), Kim, Choi, Park, and Yeon, (2016) and Micu, (2016), "FinTech" denotes "financial technology services" firstly, it should be noted that fintech firms are not uniform. Instead, this title refers to a wide set of organizations that try to address the demands of various financial consumers, all while depending on digital technology to supply solutions. The word "Fintech" first appeared in the early 1990s, when Citigroup established a "Financial Services Technology Consortium" to enhance technical partnership efforts amongst financial institutions (Arner et al., 2015).

Paradoxically, the word is now used to describe banks' most formidable competitors, specifically, "new and rising enterprises entering the financial industry that employ technological breakthroughs to deliver better, faster, and more cost-effective services to clients than those supplied by banks." FinTechs are viewed as creative enterprises that have stepped in to exploit the gap between the new expectations of connected clients and the obsolete services of traditional banks, which are constrained by industry regulation as well as their established framework and corporate values (Feyen, Frost, Gambacorta, Natarajan, & Saal, 2021).

FinTech is increasingly being used to refer to technology used in revolutionizing financial services that are traditional, such as fund raising, funds transfer, credit, mobile payments, and management of portfolio (Madir, 2019). The General Secretary of the International Association of Insurance Supervisors, a Financial Stability Board member organization, provided the following description of 'FinTech': It is a "financial innovation facilitated by technology." It is fuelling the development of new business models, applications, procedures, and products. These might have a significant influence on financial markets and institutions, as well as the delivery of financial services (Kawai, 2016).

Services that are financial in nature "provided by mobile phones, personal computers, the internet, or cards linked to a solid digital payment system," (Ozili, 2018). Whilst mobile payment are not inherently new, fast technological improvements in the last decade and growth in global financial flows have shifted the attention to financial technology in recent years.

The financial technology business includes both technology-enabled enterprises that provide financial services and organizations, providing financial institutions with direct access to technology. Fintech firms utilize technology to facilitate financial transactions between businesses and customers. Technological improvements, shifted demand for financial goods, and increased competition in financial services are all fuelling a tidal influx of FinTech start-ups a investments that have brought attention to the industry currently (S & P Global Market Intelligence, 2016).

"Fintech," according to Delliote, is an ecosystem of (at first) modest technological start-up firms that either gives financial services to the market or mostly serve the financial services sector. FinTech has been a popular business issue in recent years, yet the concept is not novel. It all started in 1866 precisely in July, with the initial connection across the Trans-Atlantic transmission line. The link not only reduced communication period betwixt North America and Europe from 10 days (i.e., carried a message via ship) to seventeen hours, but it as well encouraged the creation of global telex in addition to that, it later improved connected financial services, also known as FinTech 1.0. (Nicoletti, 2017).

The summary of this, is that the advancement of FinTech is inextricably linked to the advancement of supporting technology. The essential enabling technology of FinTech 1.0 comprised of mainframe computers, trans-Atlantic transmission cable, and so forth. These technologies produce financial technology outputs like SWIFT and ATMs. FinTech 2.0 linked technologies comprised of the Internet of Things and the internet, but FinTech 3.0 will see the development of more and more data technologies. We are presently in the transitional stage betwixt FinTech 2.0 and FinTech 3.0. (Leong, 2018).

Investment in FinTech has increased rapidly in practically every part of the world in recent years, with total worldwide investment rising as high as US $25 billion in 2016, up from US $9 billion in 2010. Whereas this sum is relatively minimal comparison to the expected $480 billion spent on IT by financial services firms globally in 2016, the rate of expansion of these investment flows is noteworthy (International Data Corporation (IDC), 2016). More than 10,000 FinTech start-ups are projected to be active globally, with the number of businesses exceeding US $1 billion valuations gradually increasing (McKinsey, 2015).

Furthermore, FinTech businesses have received significant financial backing in recent years, while the interest by the public has increased dramatically. Although nearly all the enterprises remain small, illustrating how their knowledge-based business strategy is, investment in these businesses has increased significantly. The total global investment in FinTech start-ups by June 2018, had reportedly reached 57.9 billion dollars (KMPG, 2018). Venture capital investment also significantly increased, rising from 0.8 billion dollars as at 2010 to approximately 20 billion dollars in June 2018. (KMPG, 2018).

FinTech is growing due to a combination of factors, including the ability to deliver financial services with higher efficiency and incredible speed at a competitive price level; technological advances that have diminished the barrier to entry for start-ups and other non-financial firms; and ongoing cost pressures on banks, which have compelled them to find new, innovative ways to save money (Mckinsey, 2020).

FinTech refers to a wide range of financial-related technology technologies. Payments, insurance, financial advice, securities clearing and settlement, and substitute funding platforms which are empowered via cross-cutting technologies like big data analysis, blockchain/ distributed ledger technology, and cybersecurity (Madir, 2019).

EFINA (2020) estimates that financial technology investment in a worldwide environment will exceed One Hundred Billion US Dollars ($100B), utilizing the following major stratifications:

1. Distributed Ledger Technology
2. Artificial Intelligence
3. Application Programming Interface
4. Biometrics Technology
5. Distributed ledger technology (DLT): It refers to a synchronization and shared digital system for documenting financial transactions in many locations, such as sites and institutions, within a certain duration, as opposed to traditional databases, which have a centralized data storage and/or management capabilities (Harish, Solvej, Helen, & Margaret, 2017). The Distributed Ledger technology area of financial technology is in charge of advances in digital retail payment, trading infrastructure, and investments. SETL, CIRCLE, AID, BILLON, EVERLEDGER, and other major companies operate in this field.
6. Artificial Intelligence (AI): Although the phrase artificial intelligence (AI) has been around for a while, the AI market has begun to expand fast in recent years, with numerous novel applications being regularly devised and which are upgraded. The overall worldwide AI market was valued at $20.67 billion in 2018, in addition to a expected worth of $202.57 billion in 2026, indicating a composite annual growth rate of 33.1 percent throughout the prediction period (Fortune Business Insights, 2020). The capacity of a computer to execute cognitive processes that identifies with human minds, for instance, sensing, learning, thinking, networking alongside the environment, solving the problematic, as well as even exercising creativity, is characterized as artificial intelligence. McKinsey (2016).

This refers to the employment of sophisticated computerized codes or remotely operated robots to carry out financial transactions. It can also be regarded as a vast branch of study that encompasses psychology, philosophy, linguistics, and other disciplines in addition to computer science. Apple's Siri, Amazon's Alexa, Tesla's self-driving function, as well as Netflix's recommender system, these are some of the most well-known instances of AI in use today. In financial technology, artificial intelligence is primarily concerned with data personalisation, credit rating or scoring, fraud detection, digital financial management, and risk assessment. There are several artificial technology businesses to be aware of. Kabbage, Nvidia, Ascent, Data Robots, and others are among them (Claire, 2020).

1. Application Programming Interface (API): The application programming interface (API) is the computer code that consents to two or more apps to interact with one another. It connects a particular application to a third-party application, allowing both to interact if data permission is granted. Application programming interfaces (APIs) facilitate the aggregation of the financial market and the flow of information across banking platforms and trading infrastructure as viewed through the lens of financial technology.

Mobile access as well as the internet have been transformative, permitting technology advances to be allocated directly to billions of separate customers, whose mobile devices are now gateways for utilizing a full assortment of financial services and may be expanded by third parties through APIs. This tremendous decentralisation is allowing crowdfunding services to bypass banks and directly link people seeking cash with potential investors. Crowdfunding now allows you to raise money fast and cheaply from individuals all around the world you've never met. The internet has democratized the process of obtaining start-up finance and cut the schedule from months to a few weeks (Marr, 2017). Notable companies in this field include; YOLT, BRANCH and SCALE.

1. Biometrics: Biometrics is one of the most essential financial technology categories; it allows for the authentication, identity, and security of end users' different financial transactions, as well as the protection of data. Biometrics categorises persons via exceptional physical features, like facial recognition, fingerprint as well as iris verification, and behavioural patterns, like voice identification. Biometric authentication frees financial organizations from passwords, PINs, as well as tokens, which are vulnerable to hacking, and may provide considerable benefits spanning from cybersecurity to digital payments solution. (Madir, 2019). DocuSign and PaybyFace are two examples of companies in this space.

### According to a BCG report, the financial technology business consists of 36% of digital retail payments, 25% of lending, and 19% of payment infrastructure enterprises. As a result, the Application Programming Interface dominates the financial technology business, accounting for more than 80% of the total market. There has been a growth in lending and savings players such as Paylater, FairMoney, PALMPAY, ATLAS, and others, as well as an increase in partnerships and, in certain places, rivalry between banks and telecoms, all of which has improved financial technology innovation overall (EFINA, 2020).

### 2.1.2. FinTech and Creating Business Value

FinTech has several applications, and those applications may be divided into numerous categories. We categorize FinTech applications in this study into four primary operational business processes: advisory service (ii), finance (iii), and compliance (iv).

FinTech on Payments

In terms of payment, cashless payment is the primary development trend; an increasing number of businesses have developed connected payment solutions for their clients. Mobile payments and e-wallets have significantly influenced how individuals do business. Majority of the digital payment systems depend on a prepaid balance that is transmitted via NFC, SMS, or codes, however post-paid as well as real-time payments are also available. Unlike some other kinds of electronic banking, the transmitted funds are immediately available, based on the technology, a bank might not even be involved directly. (Standard Chartered, 2020).

FinTech on Advisory Service

An advising service is the offering of recommendations to users on the basis of a set of rules as well as criteria. Advisory services include financial guidance, asset management consultancy, insurance services, customer assistance, and management decision-making. FinTech is seen as a disruptive innovation in the advisory services industry. Previous research (PwC, 2016) found that participants in asset management and insurance were concerned about how FinTech might interrupt their operations, with 74% of insurance companies and 51% of asset managers predicting that their sector would be influenced.

FinTech on Financing

Financing is the ability of receiving funding for commercial activity from numerous sources. Traditional sources of funding include family, bank borrowing, profit, venture capital, franchising, government money, stock markets, debentures, bonds, as well as others. FinTech advances give numerous new alternative funding channels, that is, financing channels that are not part of established systems. For example, crowdsourcing allows firms to receive financing at a minimized cost or in a way that was not before viable. Indeed, crowdfunding is regarded as one of the most popular forms of substitute finance (Assadi, 2015).

FinTech on Compliance

### Complying to rules that have been, such as stipulations, policies, standards, or laws, is seen as compliance. Compliance is becoming a critical business technique for many companies. Using technology to improve regulatory procedures is known as RegTech (Regulatory Technology) (Schuettel, 2017).

### 2.1.3. Challenges of FinTech

Given the rewards and opportunities given by FinTech, this innovation is not without danger. FinTech risks may be fragmented into two groups: the ones linked to the technology itself and those that relates to the type of the financial service provided (Al Ajlouni, Ahmed & Al - Hakim, Monir Suliaman. (2018);

1. The Security Risks

The Security as well as privacy of data are constantly the concerns in FinTech, as they are in other IT by-product, especially considering that the deal here is in dollars. Fraud with Credit card is an instance of a security subject that raises client's reservations on exploring automated banking (Hayashi, 2016).

1. The Technical Risks

Certain traditional banking practices have become obsolete in the face of current technology, which can be seen as a flaw in the financial system's total digital revolution. Moreover, there is a risk associated with technological failure, just like with any other information technological-based approach (Casino, Dasaklis, & Patsakis, 2019).

3. Regulation risk

Even though a lot of FinTech resolutions, like blockchain, crowdsourcing, as well as crypto currencies, are novel to the banking sector, central banks across the world have been attempting to keep up with these developments by enacting appropriate laws. The danger occurs if a regulation is delayed or does not exist. For instance, the scenario where a FinTech business doing P2P lending, lending restrictions are often dependent on a financial establishment's capital. These boundaries may not be applicable to them because they technically do not lend. P2P lending is a type of internet business that connects borrowers and lenders (Lee & Shin, 2018).

4.Financial risk

The Financial risk, still, will be related typically to financial transaction (Lee & Shin, 2018). The present inclination of making use of robot-advisors in managing wealth, for example, will expose management to some financial risk if the robot-advisors' algorithms fail. Lee and Shin (2018), alluded that presently there are new lawsuits emerging from inappropriate sales of derivative goods prompted by erroneous robot-advisor investment guidance. An additional type of financial risk is the counterparty risk which FinTech experiences while supplying financial services like student mortgages as well as mortgages.

5. Reputation risk

The most imperative features in a bank’s customer decision amongst others, is the reputation, which is influenced by the hospitality of bank employees. Businesses in Kuwait feel that a bank's financial soundness, as well as the effectiveness and willingness to help of its employees, may assist them in financial situations (Edris, 1997). Lee and Shin (2018), alluded that for FinTech firms to be efficacious, they must be highly sensitive to consumers' problems and provide enhanced user-friendly, convenient, and personalized solutions.

Nigeria has around 250 FINTECH businesses, however according to Oge (2021), a slew of notable financial technology enterprises include:

Remita

The establishment of Remita in 1991 by John Obara and Systems Spec was a watershed moment in Nigeria's financial technology industry. Its primary financial activity was to assist small and medium-sized businesses, international corporations, governments at all levels, non-governmental organizations, academic establishments, and people in receiving and making electronic payments.

Interswitch

This is one of Nigeria's oldest financial technology enterprises, founded in 2002 by Mitchell Alaegbe and headquartered in Lagos. Interswitch connects digital payments across many platforms. Visa is one of its primary investors. Visa was believed to have contributed over $200 million in November 2019 alone, with a guarantee of over $1 billion, representing a 20% share in the firm.

Flutterwave

Flutterwave was founded by Olugbenga Abgoola and Iyin Aboyeji in 2017 and has its operating headquarters in San Francisco. The main line of business is to provide payment infrastructure to banks and other enterprises. Over $170 million was obtained in its most recent funding to expand its worldwide consumer base. Flutterwave facilitates payment services between businesses and their customers. Flutterwave pioneered Batar, an effort that allows customers to establish a one-time or recurring virtual US dollar debit card in a matter of seconds. Unlike other platforms, the service is based on the client's bank supplying consumer information. Only the phone number and email address are necessary.

Lidya

Lidya is a mobile-first technology company that specializes in unique credit ratings.

Paga

Paga is similar to a mobile wallet in that it allows clients to do transactions such as utility bill payment, bank deposits, and other retail payments on their mobile devices. Tayo Oviosu launched it in 2009, but it did not begin operations until 2011.

Paystack

Shola Akinlade and Ezra Olubi founded PayStack in 2015. It ensures that payment processes are uniform for both customers and the businesses being paid.

Carbon

Carbon was founded in 2016 by One Finance and was formerly known as Paylater. The firm was formed in 2016 with the intention of providing short-term loans to its subscribers via a smartphone application.

PiggyVest

PiggyBank was the precursor to what is now known as PiggyVest. Odunayo Eweniyi Ayo Akinola, Joshua Chibueze, Somto Ifezue and Nonso Eagle founded the company in 2016 with the goal of providing savings services. It allows platform users to save little sums of currency on a monthly, weekly, or daily basis as it is handy for them. PiggyVest secures the user's vault for a certain period of time before allowing withdrawal with a substantial interest payout.

FairMoney

FariMoney was created in 2017 and has offices in Paris, France and Lagos, Nigeria. It is a mobile banking application that offers short-term credit. Access to bigger loan amounts is guaranteed if loan payments are completed on time.

Kuda

Kuda Bank has been relaunched as Kudi Money, with a beginning capital of more than $1.6 million. Babatunde Ogundeyi created it in 2017. It performs comparable responsibilities such as accepting deposits, giving credit, and so on. Kuda Bank is also well-known in the FinTech sector In 2021, it will be one of the top ten FinTech businesses in Nigeria. Kuda Bank eliminates the need to contend with the fees imposed by regular banks. Kuda Bank avoids the traditional paper procedure by doing all transactions online. This online-only bank allows people to open accounts in minutes. This leading Nigerian FinTech firm also provides personalised Mastercard ATM cards with no transfers or ATM maintenance fees. Deposits are also completely free.

Chipper Cash

Chipper Cash enables quick cross-border mobile money transactions across Africa in seconds. It was formed in by Ham Serunjogi and Maijid Moujaled in 2017, and its operating headquarters are in San Francisco, California.

E-Transact

E-tranzact is among Nigeria's oldest FinTech start-ups. It has become one of Nigeria's top FinTech firms. It also provides a solution to Nigeria's payment problems by allowing companies to take payment online. Niyi Toluwalope is the company's founder and CEO. Mobile Topup, PocketMoni, CorporatePay, BankIT, and ATM CardlexCash are other subsidiaries of the corporation. E-transact was formed in 2003 and has since completed payment requests via numerous mediums such as ATMs, POS, Web, and mobile automated transactions. It accepts networks like as VISA, AMEX, and MasterCard. E-tranzact also works in Kenya, Ghana, Zimbabwe, and Cote d'Ivoire, in addition to Nigeria. It is also present in the United Kingdom.

2.1.4. Appraising Financial Technology in Nigerian Banks

Nigeria is one of Africa's top three FinTech centres. This is no small accomplishment as FinTech keeps flourishing in the country in spite of severe difficulties. The history of the FinTech landscape in Nigeria, according to Monye (2022), may be separated into 3 fragments: Fintech 1.0 (previous), Fintech 2.0 (current), as well as Fintech 3.0. (upcoming).

FinTech 1.0 began after the first bank in Nigeria began to use technology at both the front-end and back-end of their activities. Noteworthy technological adoption by banks (telephone and computer) may be traced back to 1986 Structural Adjustment Programme, which resulted in improved competitiveness in the banking industry. Fintech 1.0 came to an end in 2007 with the Nigerian Central Bank inaugurating the Payment Systems Vision 2020.

Fintech 2.0 has been in operation since the debut of the PSV 2020. It has been defined via a shift away from switching, payments (which defined Fintech 1.0) as well as toward mobile payments, greater start-up involvement as well as technology, a drive for financial inclusion, and increasing injunction. Paga, Paystack, Kudi, etc., are among the Fintech 2.0 pioneers.

Fintech 3.0 will emerge when the first telecommunications company (most likely MTN) releases its mobile payment platform (as a result of the CBN's Payment Service Bank Regulation 2018). The extent of interruption to be expected from the introduction of a telecommunications-led Mobile Money Operator is unknown (MMO). the enormous accomplishment of M-Pesa Safaricom in Kenya as well as Mobile Money of MTN in Ghana (presently has the maximum evolution rate of mobile money).

According to Emmanuel and Adebayo (2011), technological developments have helped Nigerian banks expand into a completely new and revolutionized sector throughout the years. Furthermore, globalization is said to be the key cause of the severe rivalry witnessed in the financial technology business, which has given birth to the utilization of technical breakthroughs in the financial industry.

According to Okoye et al. (2019), these advances heralded the "New Generation Banks," which are distinguished by a highly dynamic business environment defined by quick variations because of technological revolution, greater cognizance, as well as increasing client expectations. As a result, Pierre said in 2016 that the complicated and competitive environment of the twentieth-century banking business is defined by these shifting conditions in the middle of a tumultuous economic environment, and that high-tech breakthroughs are at the heart of this worldwide change curve. Central Bank of Nigeria (2012), alludes that the Nigerian financial system has made significant investments in this advanced technology and has spearheaded the use of latest technological business solutions, resulting in increased efficiency in terms of innovative services and product which provide competitive advantages to the financial services industry.

The boom in technology applications to financial transactions has resulted in their acceptance in the functioning of most institutions. Agboola (2001) backs up this claim by looking at it in three distinct dimensions: Automated Clearing Services, Automated Payment Systems, as well as Automated Delivery Channels.

1. The Automated Clearing System (ACS):

Prior to the advent of the automated clearing system, instruments took a couple of days to clear in the clearing house, as opposed to today, when the clearing system for electronic instruments and derivatives/paper-based instruments (cheques) is so fast that instruments can be cleared in 24 hours to 48 hours. The automated clearance systems provide a variety of sub-services. They are as follows:

1. The Automated Bulk Clearing Services
2. The Central Mandate Management Systems
3. The Electronic Dividend Payment
4. The Automated Clearing House
5. The Fund sweeping Service
6. The Nigeria Inter-Bank Settlement System (NIBSS) Intra-Day Exposure System
7. The Settlement Services
8. The Automated Payment Systems:

The automated payment system is a payment system that does not involve the use of paper money or the services of a teller, but rather the electronic transfer of cash for the purpose of consummating transactions and/or debt settlement. This is usually termed to be an electronic money transfer (EFT). Payment systems automation can handle together both credit transfers (salary or payroll payments) as well as debit transfers (rents, utility bill payments, etc.). These transfers can be inter-bank transfers or intra-bank transfers. Banking services may be accessed from any location that has a network provider thanks to automated payment systems. The following electronic equipment or interfaces are used to initiate transfers:

1. The Internet Banking system
2. The Automated Teller Machine (ATM)
3. The Point-of-Sales Service (POS)
4. The Debit/Credit Card
5. The Unstructured Supplementary Service Data (USSD) Mobile Banking
6. The Society for Worldwide Interbank Financial Telecommunications (SWIFT) Code/Network
7. The Instant Payment system
8. The Phone Banking
9. The Real-Time Gross Settlement (RTGS)
10. The National Electronic Funds Transfer (NEFT)
11. The Automated Delivery Channels:

Alternative Delivery Channels are also known as Alternative Banking Channels since they extend the range of banking/financial services outside the traditional bank branch or banking buildings. These channels would consist of; the Internet or Web, Automated Teller Machines (ATM), Point-of-Sales Service (POS), Digital Interactive Voice Response (DIVR)) as well as the Smartphones.

### 2.1.5. The Financial Technology Sector Regulators in Nigeria

The Central Bank of Nigeria (CBN), the Nigerian Deposit Insurance Corporation (NDIC), the Corporate Affairs Commission (CAC), the Security and Exchange Commissions (SEC), the National Insurance Commission (NAICOM), the Nigerian Communication Commission (NCC), and the National Information Technology Development Agency (NITDA) are the responsible for controlling the financial technology companies in Nigeria (FCCPC).

1. The Central Bank of Nigeria

The Central Bank of Nigeria is Nigeria's highest financial organization, formed by a seal to exist in perpetuity the Banks and other Financial Institutions Act (BOFIA) of 1991. It is tasked with supervising and regulating of Nigeria's financial industry. Because of the CBN's principal duty as the watchdog of the Nigerian financial system, all financial technology businesses must get licenses and permissions in order to provide financial services to clients in accordance with CBN requirements.

1. Nigeria Deposit Insurance Corporation

The Nigerian Deposit Insurance Corporation is tasked with covering all deposit risks associated with banks and other financial firms that receives deposit, that are regulated in Nigeria, which covers all financial technology enterprises in this context. According to Section 15 of the NDIC Act, 2006, the NDIC registers a variety of financial technology organizations, such as Fair Money Branch, that are receiving and safe-keeping money placed by Nigerian customers.

1. The Securities and Exchange Commission

Financial technology enterprises, particularly start-ups that want to use the capital market for fund raising, must list their securities with the Securities and Exchange Commission and conform with the ISA, 2007 and the rules promulgated provided by law as a matter of required regulatory necessity.

1. The Corporate Affairs Commission

No company initiative is considered lawful until it is registered with the Corporate Affairs Commission, which is tasked with registering, incorporating, and recording firms in Nigeria. As a result, in order to do financial services or banking activity in Nigeria, all financial technology businesses (including banks) must be registered with the CAC.

1. The Nigerian Communication Commission

The Nigeria Communications Act (2003) authorizes the Nigerian Communication Commission to control the Nigerian telecommunications industry. Its provisions apply to all mobile network activities. As a result, all financial technology firms that provide financial services that need and/or include the use of cell devices must receive NCC operating licenses under the License Framework for Value-Added Services (VAS).

1. The National Information Technology Development Agency

Enforcing the powers granted to the National Information Technology Development Agency by the NITDA Act 2007 to establish and enact data protection regulations in Nigeria, the NITDA released the Nigerian Data Protection Regulations in 2019 to preserve natural persons' rights to data security and to adopt a secured practice of transacting relating to the exchange of customers' private information.

1. National Insurance Commission

The National Insurance Commission (NAICOM) was founded by the National Insurance Commission Act, 1997. It is tasked with guaranteeing the management, monitoring, as well as supervision of insurance enterprises in Nigeria. This commission has a strong grip over the Insur-Tech industry.

1. The Federal Competition and Consumer Protection Commission

### The Federal Competition and Consumer Protection Act created the Federal Competition and Consumer Protection Commission (FCCPA). Anti-competitive practices in the financial technology business are prohibited under the laws.

### 2.1.6. Financial Technology and cashless policy

A cashless economy, contrast to what the word indicates, has to do with the volume of cash-based transactions that is limited to an absolute minimum rather than an absolute lack of cash transactions. Woodford (2003), alluded that cashless policy is presumed to be one with no transaction schisms that may be alleviated by the usage of cash balances hence it gives a justification for retaining these balances even when they receive a rate of return.

The Nigerian Financial technology extends back to the Smart Card initiative in 1996 by a conglomerate of banks (Uche & Ehikwe, 2001, Dalis, 2010). M-Pesa's success in Kenya, on the other hand, changed digital banking services and products across Africa and around the world. The success of M-Pesa, as well as the negative effects of the 2007/2008 global financial crises, prompted the transformation of Nigeria's payment system in effort to enhance financial inclusion, bring down the cost of banking services, and work on refining how effective monetary policy is (CBN, 2011). Financial technology goods in Nigeria are primarily characterized as wholesale and retail digital products. The real-time gross settlement system (RTGS) is the wholesale digital product, while ATMs, POSs, IB, MB, Nigerian Interbank Settlement System Instant Payment (NIP), Nigerian Interbank Settlement System Electronic Fund Transfer (NEFT), and e-bills pay transactions are the retail products. The CBN publicised in April 2011 its cashless policy in order to remove the adverse implications of transactions that are cash based like high cash handling costs, risk associated with cash-based transactions such as inadequacies and corrupt practices, rising subsidy by the banking public, and a vastly increased informal sector.

The policy's implementation date was staggered among the states, with the countrywide adoption set for July 1, 2014. During the implementation phase, the policy was put on hold. Notwithstanding the policy's discontinuation, the CBN proceeded to develop the payment system and regulate financial goods by issuing a number of instructions. The CBN released a "Guideline on the Operation of Electronic Payment Channels in Nigeria" in April 2016, with specially referring to ATM, POS, cellular phone and web acceptance amenities (CBN, 2016). In October 2018, the "Guideline for Licensing and Regulating Payment Service Banks in Nigeria" was published to encourage financial inclusion for individuals earn so little, smaller firms, and the excluded financially (CBN, 2018).

The new guidelines include "a downward review of charges for electronic banking transactions; an evaluation of other bank charges to correspond with market developments; and the integration of various sections on Accountability and Responsibility, as well as a Sanction Regime to specifically tackle incidents of additional, un - authorized, and/or irregular charges" (CBN, 2019a). These reforms strengthened the Nigerian financial system as well as encouraged the utilization of digital payment systems. The Consumer Protection Department has also been reinforced in order to address complaints involving banks and their consumers over electronic transfers. On September 17, 2019, the cashless policy was reinstated. The revised circular maintained the key features of the halted policy, such as staggering implementation across states. The CBN also urged bank clients to pay for products, services, and transactions through electronic platforms. Cash receipt fees have resurfaced as the number of digital transactions has increased.

### 2.1.7. Merits of The Cashless Policy.

The cashless policy, according to Odior & Banuso (2012), offers the following merits:

i. Reduced Cost: The cash-based economy is typically linked to a huge cost associated with cash across the value chain, from the CBN and banks to firms and persons, they all face the additional charges that deals with large amounts of cash. These expenditures will be reduced if we go to a cashless economy. The significant expenses of cash administration, currency sorting, cash transactions, and the regular issuance of currency notes account for operational costs.

ii. Reduced Risk of Using Currency: Using actual cash increases cash-related crimes such as armed robbery and burglary. In the event of a fire, it might also result in financial losses. However, in a cashless economy, such negative impacts are minimized.

iii. Reduced Cash Transaction Cost Subsidies: A cash-based economy is accompanied by significant cash transaction cost subsidy. According to CBN data, 90% of customers in the bank with daily withdrawals which are for less than N150, 000, whereas just 10% of bank customers who take more than N150, 000 are in charge for the increase in costs associated with managing cash experienced by all bank customers. This means that the whole banking community subsidizes the costs incurred by the 10% of the population who use a lot of cash. In a cashless economy, this subsidy will be reduced, and the expense of cash handling will be borne by a small percentage of the banking populace rather than the whole banking populace.

iv. Informal Economy: When people use a lot of cash, they end up with a lot of money that isn't in the banking system or the formal economy. This reduces monetary policy's efficacy in controlling inflation and fostering economic growth. A cashless economy has the potential to halt this trend.

v. Reduction in Corruption: A cash-based economy fosters fraudulence, which manifests itself in the form of money laundering, leakages, and other fraudulent behaviours, but a cashless society discourages such actions. Aside from the basic benefits mentioned above, other stakeholders, including consumers, corporations, and the government, are expected to reap a range of benefits.

### 2.1.8. Challenges of the Cashless Policy.

According to Odior & Banuso (2012), the CBN's cashless strategy, although offering significant benefits, also poses several potential challenges: These difficulties are outlined below.

i. Fraud: Payment fraud is a threat to the policy. The pilot scheme's experience in Lagos so far has revealed a significant rate of fraudulent acts.

ii. Indiscriminate withdrawals from Accounts: The Lagos experience has also demonstrated that there are incidents of indiscriminate subtractions from accounts, resulting from financial service providers' inadequate use of modern technologies.

iii. A Country with a High Illiteracy Rate: A country with a high prevalence of illiteracy, such as Nigeria, may have certain difficulties in adopting a cashless economy. Illiteracy will be the most significant hurdle to the country's transition to a cashless society, among other things.

iv. Inefficiency: Inefficiency caused by bad infrastructure is another barrier to the successful execution of the cashless policy. When consumers go to an ATM to make withdrawals, for example, the cash is frequently not released to them even after the system has debited their accounts. It's also possible that there's a problem with the network. As a result, ATMs and POS devices are unable to function when customers require them.

v. Another well-known infrastructure difficulty is the public electricity supply system. Electricity is required for effective e-payment. Unfortunately, where electricity is provided in Nigeria, it is exceedingly epileptic, and in most rural areas, it is non-existent. This is clearly a hindrance to the cashless policy's success in Nigeria.

### 2.1.9. The Evolution of Payment System

According to Arroyo (2020), the payment system is critical in every economy because it is the conduit via which financial properties travel from one sector to another. Payment systems are the mechanisms used to perform economic transactions. These systems have emerged alongside the different types of money throughout ages. As a result, money was defined as "anything that is usually acceptable in payment for goods and services or in repayment of debts." The apex bank has provided a lot of financial services in order to ensure the policy's success. Mobile banking, online banking, telephone banking, electronic cards, POS terminals, and ATMs are the most prominent cashless banking methods worldwide.

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### 2.1.10. The Assessment of E-Banking

The introduction of e-banking has accelerated globalization in banking operations, since services are now supplied through international village infrastructure. Most of the e-banking apps utilization the internet to take advantage of the benefits of online banking by offering consumers with easy and flexible services at a fair cost (Ololade & Ogbeide, 2017). Customers may see their current account balances at any time using online banking. At the touch of a button, customers no longer have to worry about if a cheque has been cleared or a deposit has been posted. Customers can use internet banking to check the status of their saving, current, and money market accounts with the click of a mouse. You can pay bills electronically using online banking. Customers can also download account transactions from the website, which can then be easily imported onto a standard PC at home or at work. In conclusion, a customer's account can be accessed from any location on the planet. The following are some other payment options:

1. Cheques

2. Bank drafts and other bank instruments.

3. ATM.

4. NIBSS Funds Transfers.

5. RTGS; Real Time Gross Settlements

6. Mobile Money

7. E- transfers.

8. POS Terminal

### 2.1.11. Implications of Cash Based Economy

The economy in Nigeria is mainly cash-oriented, with most transactions carried out using cash payments. The predominant irregular economy in Nigeria, cash is a powerful motivation. The Central Bank of Nigeria (2012), alluded that as of December 2011, cash-related transactions accounted for more than 99 percent of client activity in Nigerian banks. Nigeria is, without a doubt, a cash-based economy. Cash withdrawals from ATMs and over-the-counter (OTC) transactions account for 85 percent of all transactions.

Cheques and POS have around 29,159,960 and 1,059,069 transaction volumes, representing 14 percent and 1 percent, respectively, which is a tiny or minuscule transaction volume, while the WEB channel accounts for 0% of transaction volume. The financial sector, the government, and people all bear expenses in a cash-based economy. The increase use of cash leads to increase in processing costs, which are paid by all businesses throughout the value chain. For instance, the Central Bank of Nigeria (CBN) is claimed to spend a fortune each year on producing new currencies as a result of excessive cash handling.

It is also worthy of note that cash is a crucial component in the fuelling of various vices in Nigeria, with severe effects for people, corporations, and the government. In light of the aforementioned, the Central Bank of Nigeria (CBN implementation)'s of the cashless policy is regarded as a policy package with several advantages, as it tries to foster cashless payments, hence halting some cash-related vices (Bayero, 2015).

### 2.1.12. Poverty

To properly analyse economic reasons and provide potential remedies to the issue, we must first define poverty. In general, no exact and accepted definition of poverty exists in existing literature. This is due to the multifaceted complexity of poverty (United Nations, 2014). The numerous understandings of poverty demonstrate that how one defines poverty is dependent on the technique employed to conceive and quantify it.

In the conception of poverty, there are several methods. The Nigeria Bureau of Statistics use a monetarist approach to measuring poverty in Nigeria. This method of measuring poverty in monetary terms employs the poverty line, or the national poverty rate, and an income or consumption measurement. In other terms, people below the poverty line or with a low income are considered poor (Titumir & Rahman, 2013).

According to the monetarist viewpoint, poverty deals with the absence of enough money for the procurement of fundamental commodities and services required for a socially approved minimum level of life. Of course, income is determined by education, health, life expectancy, child mortality, and a variety of other factors. This technique employs an ex-post assessment of poverty and is regarded improper since poverty is mostly a stochastic phenomenon, and thus a household's existing poverty level may not be a trustworthy predictor of the household's predicted hardship in the coming year (Chaudhuri, 2003).

The vulnerability method appears as a superior way of theorizing poverty, particularly in a emerging nation like Nigeria. The vulnerability method mainly looks at how individuals are open to the danger of shocks, which might include economic, unemployment, health hazard, human capital hazard, and anthropogenic shocks, and how these events affect the society, making them vulnerable to poverty. The vulnerability approach to poverty, according to Barrientos and Hulme (2008), examines how individuals might end up being poor because of bad or unfavourable occurrences. The vulnerability approach to poverty assessment is basically a futuristic, ex-ante, and stochastic method to poverty measurement that considers not just those who are already poor but those who might be poor as a consequence of unfavourable occurrences, macroeconomic shocks, or illnesses (Prowse, 2003).

However, Dauda (2017) defines it as a condition in which a person or family is unable to meet basic necessities, lacks chances afforded by enabling environs to increase its welfare, or is at risk of losing its existing way of living.

 Blackwood and Lynch (1994), alludes that the poor may be identified by using several factors, like the level of spending and consumption. Furthermore, Sen (1983) defined poverty as "entitlements assumed to represent the different bundles of commodities and services over which one has control, taking into account the methods by which such goods are obtained as well as the provision of relevant goods." Others, on the other hand, defined poverty in extremely comprehensive terms, like not being able to meet basic needs for a good existence; "physical; food, housing, education, health care," and so on; and "non-physical; identity, participation," and so on (World Bank, 2016). Adam Smith (1776), the pioneer of modern economics, described poverty as "the inability to acquire needs necessitated by nature or tradition". The social/psychological situation element of poverty (custom) is given the same weight in this definition as the material, solely economic state. He expanded on the meaning by defining what kind of necessities essential to be seen as not being poor: "by necessities, I mean not only the commodities that are indispensably necessary for the support of life, but whatever the custom of the country sees as indecent for creditable people, even of the lowest order, to be without" (Smith, 1776). As a result, it combines a total measure (natural needs) with characteristics of a relative measure (necessities required by custom).

### Karl Marx was more explicit on the context-specific and relative character of the concept of poverty and did not specify an absolute measure: "'Our demands and enjoyments emerge from society; we measure them, consequently, by society and not by the products of their fulfilment" (Wood, 1988).

### 2.13. Poverty and Vulnerability

The risk coefficient tightly links poverty and vulnerability. This instinctive appeal, which links poverty with fragility, may not be completely incorrect. "Poverty is an ex-post assessment of a household's well-being, or lack thereof," writes Chaudhuri (2003). As a result, poverty indicates that it is currently in the state of lack, a lack of resources or ability to meet current requirements. Vulnerability might be considered as an ex-ante metric of well-being, showing not only how wealthy a household is today, but then again, its future potential (Heitzmann, Canagarajah, and Siegel, 2002). As a result, there is a slim boundary between the two notions: both might be two sides of the same coin, divided only by the idea of peril or uncertainty (Alwang, Siegel, & Jorgensen, 2001). Poverty, for example, is positive that the sum of individuals reflecting depravity is definite and can be determined by surveys; but, the danger or vulnerability of sliding into poverty in the coming years is unclear. The We are unable to predict the coming years with confidence because, there lacks a stochastic method for doing so (Keynes, 1936). The danger of the future is not only unpredictable, but it might also be multidimensional, making accurate measures impossible. Households' vulnerability to risk, which could put them at risk of becoming impoverished in the coming years, could be the result of a variety of origin, including crop failures, high food prices, diminish in their primary source of income for the household, disease and sickness, environmental catastrophes, political turmoil, and economic decline (Chaudhuri, 2003). There is certain clarity that there will be no distinction between ex-ante (vulnerability) and ex-post (poor) indicators of family well-being in the absence of peril or uncertainty about the future.

**2.1.14. Features of Poverty**

1. Individual Features

Individual characteristics that fuel poverty include mindsets, human resources, and social assistance involvement (Gans, 1995). Individualism theory is founded on American principles and faith in the free market system, and is meant to give an incentive for everyone. Individualism emphasizes personal initiative and commitment to obtain basic necessities such as shelter, food and medical services (Rank, 2004). In broad sense, the United States is referred to as a land of opportunity, where persons can explore the American dream of economic wealth as well as successfulness. The concept of the American dream reinforces that talent, morality, and industriousness can yield positive results and that personal poverty is a failed experiment owing to the absence of motivation (Rank, 2004).

Cultural and Neighbourhood Features

The concepts of "culture of poverty" & "social isolation" provide paradigms aiding in clarifying how poverty emerges and lingers in specific neighbourhoods or communities. The cultural and neighbourhood elements are related to how people's living environment affect their poverty as well as prosperity. Oscar Lewis created the phrase "culture of poverty" in 1961 and 1966 while doing poverty research in Mexico and Puerto Rico (Mandell & Schram, 2003). The poverty culture idea is built on the principal fact that the underprivileged besides the affluent have unique patterns of ideals, views, and social standards. This argument alludes that the depraved become depraved because they develop specific psychological habits linked to poverty. Lewis alludes that poor come to know not to work hard, not to strategize for the years ahead, to engage in unsafe sex, as well as to waste cash. Lewis claimed that poverty is handed down to the next generation as a result of children being socialized to poverty-related beliefs and aspirations. Poverty culture asserts that the poor can combat their way to a better life. (McIntyre, 2002).

Structural Features

Poverty has historically been associated with larger socioeconomic institutions. According to some structural reasons, capitalism creates environments that favour poverty. Beeghley (2000), alluded that the structure of the United States economy guarantees that huge numbers of people are impoverished despite personal effort (hard work, competence). The functionalist theory of Davis and Moores, the social exclusion viewpoint and labour market theories, in particular, shaded more light on the structural causes of poverty.

**2.1.15. Metrics for Poverty**

 The metric used in gauging poverty is not universal, because of the biases inherent in measuring, defining poverty has remained challenging and disputed in general. Several methods for quantifying absolute, relative, and subjective poverty were created by academics. Its measurement has been divided into two operations: identifying the impoverished and aggregating ...their poverty is factored into a larger picture. Absolute poverty is calculated as follows:

1.The Head Count/Incidence of Poverty

This one is rooted in line of poverty calculated via pricing a basic bag of necessities for human survival using non-poor families' income, consumption, or spending statistics (Lok-Dessallien, 1999). This is commonly calculated as a percentage of the amount of people living below the poverty line to the total population of a specified society. It fails truly depict the depth or seriousness of the problem.

2. The Poverty Gap/Income Shortfall

The difference between PL and the average low income is expressed as a ratio of the PL (Abimiku, 2006). It measures the extent of the income gap below the PL providing a report on the amount of income required to bring the poor's income up to the PL. It gauges the level of poverty but does not indicate its brutality by exhibiting the dispersion of living standards among the poor.

3. The Disparity of Income Distribution

Gastwirth and Glauberman, (1976), Atkinson, (1970), Gastwirth, (1972), alluded that it employs the Lorenz Curve (LC) as well as the Gini Coefficient (GC) to represent the dispersion of poverty. The LC is a graphical portrayal of the magnitude of income distribution fluctuation. It represents the total number of poor individuals on the vertical plane and the total percentage of poor people using income on the horizontal plane. The Lorenz Curve is used by the GC to calculate income dispersal. It denotes the discrepancy between a country's actual and hypothetically equates to income distribution. Kentor (2001). An increased GC suggests greater economic disparity, whilst a reduced GC suggests a more egalitarian allocation of wealth. This approach has been faulted as it neglects to compute the sum of people below the poverty level.

The Composite Poverty Metrics

The representation integrates the advantages of the preceding models, particularly the low-income population and income dispersal. It employs indexes such as the Sen Index (S) as well as the Forster-Geer-Thorbeck Index (FGT). The S Index puts together the Head Count Index, Poverty Gap Index, as well as Gender Gap Index. The most typical metrics used into the FGT index are the, poverty gap, severity of poverty, as well as poverty headcount (Lugo & Maasoumi, 2009). One disadvantage of composite poverty metrics is, they are intended to reflect and contrast living standards covering every nation in the globe using accessible data, however they did not provide a deep understanding of every key indicator of development or poverty in the state being examined (De Kruijk & Rutten, 2007).

The Physical Quality of Life Index (PQ LI) and the Augmented Physical Quality of Life Index (AP Q LI)

The strategy is concerned with social development issues as well as assesses quality of life using qualitative indices of social welfare rather than riches. It emphasizes on three metrics: basic literacy, life expectancy, and infant mortality. It developed to incorporate more elements in assessing poverty, such as women's status, health status, defense effort, geography, economics, cultural diversity, demography, political involvement, and welfare effort. The word "quality of life" applies to both health-related and non-health-related features like work and social connections (Gill & Feinstein, 1994). This paradigm comes under the zeal for allocating absolute values to qualitative characteristics.

The Human Development Index

In assessing poverty, this incorporates both income and non-income elements. It compares a country's level of deprivation to that of the rest of the world. Anand, (1994), Noorbakhsh, (1998), and Rep, (2006), alludes that the United Development Programme (UNDP) created the HDI in 1990, and which has been utilized to compare the relative achievements of countries on the poverty scale. It is concerned with issues like as life expectancy, literacy, and per capita income. The median income of a specified percentage of the total population deemed poor in comparison to the established income of the over-all population, as well as the fraction of the populace whose income falls short of a predefined percentage of the society's mean income, are used to calculate relative poverty. The results of participatory research on individual perceptions of poverty are used to assess poverty in Subjective Poverty.

### 2.1.16. Poverty in Nigeria

Poverty, in all of its manifestations, has remained a menace and an obstacle to humanity. It is complex, diverse, and multifaceted, showing itself in social, economic, environmental, political, and all other elements of humanity. Nigeria is regarded as part of the world's most underprivileged and most unequal countries. Nigeria's poverty concerns have captured the focus of subsequent regimes. Unfortunately, the paradox poverty in the core of wealth persists, growing during periods of economic expansion (Omoyibo, 2013).

Poverty in Nigeria, according to Dauda (2017), varies from the pattern in several other countries because, despite economic growth, poverty remains on the ascent, including the North-East as well as North-West geopolitical zones topping poverty indicators. This varies with growing economies in Asia, North America, and Europe, where economic growth brings about poverty reduction. This gives credibility to the widely held idea that the connection between economic growth, development as well as poverty is asymmetric.

The National Bureau of Statistics (2020), alludes that the portion of Nigerians classified as fairly as well as severely poor increased after 21 percent and 6.2 percent in 1980 to 34.2 percent as well as 12.1 percent in 1985, respectively. By 2010, around 30.3 percent and 38.7 percent of the country's populace, respectively, continued moderately and severely impoverished. Likewise, the number of persons living in absolute poverty climbed from 17.1m in 1980 to 34.7m in 1985, then to 67.1m in 1986 and to almost 112.47m in 2010. Nonetheless, in 2019, the figure fell to 84.0m.

Various poverty-reduction strategies and programs have been implemented in Nigeria to relieve or eliminate poverty. Although they were basically sectoral reforms, the underlying objective was poverty alleviation (Oshewolo, 2010). In Nigeria, prominent poverty-reduction initiatives comprise: Operation Feed the Nation, Free and Compulsory Primary Education, Low-Cost Housing, River Basin Development Authorities, Rural Banking, Family Economic Advancement Programme, Petroleum Trust Fund, etc.

Despite the numerous programs, poverty eradication remains an illusion in Nigeria. The SAP and post-SAP periods in Nigeria were marked via vigorous government participation in poverty reduction projects as well as minimal enhancement in living standards. Many explanations were previously cited as being the reason behind poor success of poverty mitigation projects in Nigeria, including substandard strategy and execution, policy irregularities as well as discontinuities, inadequate finance, and fraudulence (Arisi-Nwugballa et al., 2016, Dauda, 2017).

## 2.2. Theoretical Framework

Various theories were used in this research work; they are as follows;

### 2.2.1. Progressive Social Theory of Poverty

Proponents of this theory believed that it is economic, political, and social distortions, as well as prejudice, that limit economic prospects to produce affluence and conquer poverty. Social theorists launched a complete assault on the individual theory of poverty in the nineteenth century, exploring how economic and social institutions overruled and caused distinct poor conditions. They looked at the way capitalist economic system formed a reserve army of people who are unemployed in way to sustain salaries down (Bradshaw & Main, 2016). They maintained that people could work really hard and possess a positive attitude while yet slipping into poverty due to faulty social and economic structures. Poverty is produced by economic, social, as well as political factors that force the poor to fall behind, irrespective of their dedication. In Nigeria, government actions and policies aggravate poverty. These may be executed with noble intents, but bad execution might impoverish residents. The SAP and its varied penalties, comprises of significant devaluation of the Naira, acute hike in price, industrial closures, privatisation, commercialisation, reasonable petroleum pricing, and an unregulated free market all added to the destitute state. The Nigerian political economy has greatly increased the country's level of poverty.

* + 1. **Innovation Diffusion Theory (IDT)**

Rogers established innovation diffusion theory in 1962, making the theory one of the earliest social science frameworks to investigate any type of innovation. This hypothesis arose from various diffusion experiments conducted in the 1950s that focused on individual variations in innovativeness. Rogers (2003) outlined the four primary elements influencing behaviour as follows: Innovation, Communication﻿ Channels, Time﻿ and Social Systems. ﻿

Roger (2003) explores features of technology users who utilize novel technologies in his Diffusion of Innovation Theory. This hypothesis is in pursuance of describing the how, why, and how rapidly new ideas or technologies expand. Roger (2003) describes diffusion as the mechanism through which an innovation gradually spread all via the social system. ﻿Rogers (2003) argued that five inventive characteristics influence a person's behaviour and indicated the rate of innovation diffusion. Relative benefit, compatibility, intricacy, trialability, and observability are some of them.

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Innovative diffusion technology may be used to research technological adoption, appraisal, and implementation (Fichman, 1992). Moore and Benbasat (1991) worked extensively on the innovative diffusion of technology in the context of information technology, adapting and refining the five attributes of innovations presented in the innovative diffusion of technology into a set of constructs that could be utilized to study individual technology acceptance (Udeh, 2008). This entry was published on August 1, 2010. ﻿ They enhanced the Rogers Model construct by incorporating the voluntariness of usage and image. Therefore, the parameters compatibility, perceived utility (relative advantage), and ease of use were discovered to have the most influence on utilization decisions (complexity). Other than that, the demonstrability result, image, visibility, and trial ability had no substantial influence on the persons' usage.

### 2.2.3 Endogenous Growth Model

Although many researchers addressed the challenges that led to the development of this model, one well-known proponent of endogenous growth theory who took on the challenge of eliciting solutions to the topic of elements that signify technological development in the economy was Paul Romer (1990). He attacked Solow's model for seeing technological growth as a non-economic factor and failing to account for elements that may spur technological progress, such as the learning process, research, and capital accumulation. This paradigm usually implies that human capital investment and innovation increase economic production. Among the model's main arguments is that investment in education, research subsidies, and idea importation, as well as intellectual property protection, are critical based upon the evidence that most knowledge of economies, like the United States as well as the Europe, are regarded to be sources of strong competition and high innovation due to the effects of spill over and positive externalities.

## 2.3. Empirical Literature

There is insufficient and inconclusive data on how investment in financial technology affects the economy through increasing the availability of cashless financial instruments, hence lowering poverty. Poverty alleviation is becoming a more important topic for social scientists across the board, from finance and economics through entrepreneurship and management (Sutter, Bruton, and Chen, 2019).

 Currently, academics have started to look at the link connecting economic growth and poverty reduction through entrepreneurship as well as the development of new technologies and procedures (Ahlstrom, 2015, Bloom et al. 2013, Bloom, Draca, and Van Reenen 2016, McCloskey 2017). This resulted in novel methods to (and perspectives on) poverty reduction that contradict standard poverty research theory, which generally was fixated on financial aid and other ultimate poverty alleviation strategies (Whitacre, Meadowcroft, and Gallardo 2019).

 Time series data from South Africa was utilization by Musakwa and Odhiambo (2020), they discovered that remittances improve poverty after it is assessed via household consumption expenditure. Musakwa and Odhiambo (2020) discovered a bi-directional relationship connecting remittances and poverty as measured via household consumption expenditure in another study utilizing time series data from Botswana.

Lal (2018), investigated the influence of financial inclusion on mitigation of poverty via cooperative banks. Between July and December 2015, data from a primary source were extracted from 540 recipients of cooperative banks functioning in 3 northern Indian states: Punjab, Himachal Pradesh (HP), and J&K. The factor analysis approach was utilized to reduce the entire dataset into as few components as feasible. The validity and reliability of the statistics were determined using the second-order CFA. One-way ANOVA, the t-test, and SEM were utilized to analyse the data. Financial inclusion via cooperative banks, according to the study's findings, has a direct and positive influence on poverty reduction. The study demonstrates how financial inclusion has transformed the lives of the poor by providing them with rudimentary financial services like savings, loans, credit and insurance.

The increasing popularization of fin-tech in many ways is used as a developmental answer, is predicated on the sustained distinction of the prototypical neoliberal development intrusion: microcredit and the larger idea of financial inclusion (Bateman 2014; Mader 2016). In the 1980s, the microcredit movement was founded as well as swiftly authenticated on outrageously exaggerated and eventually incorrect promises that delivering modest loans to groups of impoverished women were seen as a cure for worldwide decrease in poverty. These statements were particularly connected with its principal light, Dr Muhammad Yunus, a Nobel Peace Prize recipient in 2006. Despite the lack of robust empirical data backing up microcredit as an instrument effective to counter poverty at that time (Bateman 2019), the behemoth that was microcredit continued to roll.

According to Suri and Jack (2016), M-Pesa did efficaciously tackle poverty in the country Kenya via the generation of additional funds that have empowered countless female clients to transition from subsistence farming and into micro - enterprises, notably small-scale trade activities. Suri and Jack's assertions are based on a long-running household panel survey conducted between 2008-2014. The primary evaluation of the long-run influence is determined by associating households with a significant increased accessibility to M-Pesa agents throughout this time frame versus those without. They suggest that the immensely elevating consequence they detailed is as a result of disadvantaged households' absorption within the official financial system. 'Fundamental financial services like the efforts to effectively send, store, and transact cash are overlooked in most advanced economies, as well as also reaching millions of Kenyans in the form of mobile money at exceptional pace in the past decade, seem to possess the ability to substantially stimulate economic well-being,' they write.

In their paper "Poverty reduction in rural China: Does digital finance matter?" Chen and Zhao (2021), noticed that digital money is extensively distributed and used in China, and that this new financial technology format might end up being a novel means to relieve poverty in countryside regions. They linked prefectural-level digital financial indices with microdata on rural families from the China Household Finance Survey (CHFS) in 2017. They discovered that digital finance considerably reduces absolute and relative poverty among rural Chinese families, and it is backed by a range of robustness tests like the instrumental variable method, different specifications, and eliminating extreme findings. They also offered evidence that the poverty-reduction effect of digital finance is thought to be attributed to reducing credit and information barriers, extending social networks, as well as encouraging entrepreneurship. Their research enriched the area of study on financial poverty reduction and provided understanding on the establishment of public financial policies on poverty reduction in additional nations, particularly in certain emerging nations.

Appiah-Otoo and Song (2021), investigated on the study titled "The Impact of Fintech on Poverty Reduction: Evidence from China." They investigated the indirect and direct impacts of the sub-measures of financial technology (fintech) of credit and third-party payment on poverty as defined by per capita household consumption. Using panel data from thirty-one Chinese provinces from 2011-2017, the study found that fintech and related sub-measures improve poverty in China. The findings also revealed that FinTech helps to eliminate poverty in China by complementing financial development and economic growth.

Ye, Chen, and Li (2022) conducted study on "Financial technology as a driver of poverty alleviation in China: Evidence from an innovative regression technique," collecting data from 31 provinces from 2011 to 2020. To reflect financial technological progress, they first collected data using word frequency and web crawler technology analysis, and then fashioned a fintech index for respective province. They also suggested a unique sparse support vector quantile regression to analyse the impact of fintech on poverty reduction within particular Chinese provinces, because to the heterogeneity of poverty across distinct provincial regions. The quantile estimators from the proposed technique were used as an empirical "location" indicator for poverty. The empirical findings revealed that, while the advancement of the fintech index varies by province, fintech successfully decreases poverty in all provinces. Furthermore, the benefits of fintech on reducing poverty are substantially higher in low-income provinces than in high-income provinces. As a result, the study recommended that policymakers and practitioners must establish additional digital financial technology systems, particularly in China's low-income regions, in order to reduce poverty.

Echekoba and Ezu (2012) investigated the issues and acceptability of electronic retail payment systems in Nigeria and discovered that the utilization of cash remains on the increase in Nigeria despite the CBN's efforts to endorse the usage of electronic payment systems. They found problems such as the absence of a legislative framework, lack of crucial technological infrastructure, and lack of socio-cultural support, all of which are necessary to run a smooth and successful electronic payment system.

Similarly, according to Babatunde and Laoye (2011), the cashless system has the following advantages: long queues at vending machines and point-of-sale terminals is substantially decreased leading to quicker transaction, because purchases may be paid for immediately, even from the comfort of one's armchair, by electronic means, enhancing service swiftness as well as decreasing personnel numbers during off-peak hours. Increased Sales: The introduction of the cashless policy clearly revealed a 20 percent rise in sales. This makes the card's value available 24 hours a day, seven days a week, growing the amount of time obtainable for commercial operations. All of this leads to increased sales and stronger connections.

Odior and Banuso (2012) investigated the benefits, policy implications and challenges of cashless banking in Nigeria and discovered that the transition to a cashless Nigeria appears to be advantageous, though it is fraught with anxieties about managing the of cost savings resulting from its execution and security.

Similarly, Nwankwo and Eze (2012) investigated the problems and prospects of electronic payment in Nigeria's cashless economy and discovered that while the electronic payment system has significant implications for Nigeria's cashless economy, it will significantly reduce credit extension and deposit mobilization by Nigerian deposit money banks.

Ozoh, Nwaka, Igberi, and Uma (2016) investigated the impact of investments on Nigerian economic development from 2007 to 2012. Following some descriptive statistics, a series of time series property tests, and diagnostic tests, the method of a vector error correction model was used. The study discovered, among other things, that domestic investment had a negligible influence on growth over the study period. Foreign direct investment did not respond favourably to growth, which was expected owing to Nigeria's predominantly rural economy, limited technology, and a poor industrial sector required to boost sophisticated foreign output. Further analysis proved that it would be helpful in the long term.

Moreso, Bara, and Mudzingiri (2016) estimated the influence of financial innovation on economic development using the Autoregressive Distributed Lag (ARDL) model. Financial innovation was demonstrated to possess a favourable effect on economic growth.

Guild (2017), on the other side, gained insights through imagining Fintech and the future of finance. The successful use of Fintech to achieve financial inclusion is strongly contingent on skilled regulatory oversight. The findings suggested that implementing a responsive regulatory approach, instead of an overly interventionist one, is the best basis for advancing financial inclusion via technological revolution by exploring various degrees of success in the acceptance of Fintech services in Kenya, India, and China.

Campbell (2017) examined inclusive growth and long-term human development in Nigeria using secondary data from 1990 to 2014 and descriptive statistical analysis approaches. As a result, indexes of human development and the knowledge economy in emerging and developing nations outperformed those in industrialized ones.

Meanwhile, Orokpo and Ngara (2017) used a historical method tempered with empirical observation to study ICT as a substitute Model for Poverty Reduction in Nigeria; ICT looks to offer a more realistic and durable choice for poverty reduction than the prior approach. The author concluded that, in order to perpetuate the benefits of Nigeria's telecom revolution, enhance productivity and eliminate poverty in the face of expanding globalization, the government, development partners, and all participants must work together to organize ICT in all segments of the national economy.

Okoye, Nwisienyi, Kenechukwu, and Obi (2019) explored growing financial technological revolution and economic growth in Nigeria. From 2009 to 2019, the CBN statistical bulletin was utilized to gather quarterly time series secondary data on ATM transactions, POS transfer transactions, internet/web pay transactions, and mobile phone transfer transactions) as part of the drivers of economic development. The Autoregressive Distributed Lag (ARDL) method was used for the investigation, which found long-run and short-run dynamics amid chosen variables. Mobile phone transfers were shown to be favourably connected to economic growth in the long run and at lag 0 in the short run, whereas ATM as well as POS transfers were found to be adversely associated to economic growth in the long run but positive at lag 1 in the short run. Simply put, the study found a positive (albeit not substantial) association between economic development and several characteristics of financial technological innovation.

From 2007 to 2017, Achugamonu, Alexander, Gershon, Arewa, and Okoye (2020) examined digital finance as a tool for extending the borders of financial inclusion in Sub-Saharan Africa, using secondary data gathered from the World Bank data repository in 27 Sub-Saharan African nations. The data was analysed using Generalized Moments Methods and the Granger Error Correction Method. The findings revealed a favourable long-run link between digital finance and financial inclusion.

Fangky, Mercurius, and Steph (2020), they investigated the role of the FinTech mechanism in technological innovation using both descriptive and qualitative approaches, and his findings revealed that the definition of FinTech is evident for the business sector, culminating in a conceptual framework of the FinTech mechanism's role in technological innovation centred on surveys and underlying theories. He argued that his research provided insight and knowledge for practitioners seeking to establish FinTech-related enterprises, as well as suggestions for scholars seeking to do comprehensive financial technology research.

Ifeyinwa's (2020) research on conveying robot requirements in a developing economy and national development was particularly noteworthy. Because of its multiple benefits, it was discovered that there is a high demand for the deployment of robots in Nigeria. The benefits indicated included superior strength, accuracy, and sensory abilities that might lead to high production, promoting economic growth and national progress.

Furthermore, Shahin, Tetyana, and Pavlo (2020) used cross-country data to alleviate scepticism about the role of Fintech in the economic growth process. They justified the use of variables as independent variables (the ratio of the population using the internet or mobile phone to access a financial institution account, the percentage of persons that use the cyberspace to pay bills or purchase an item online, and the ratio of people who made or received digital payments). while GDP growth rates and GDP per capita were dependent variables), by stating that the FinTech segment's most significant transformational effect on the financial services market pertains to banking services, specifically transfers and payments. According to the conclusions of the correlation research, there is an unswerving association between GDP per capita and chosen banking sector digitalization metrics.

**2.4. Knowledge Gap in Empirical Review**

The analysis found that most financial technology studies focused on the use of technology, as evidenced by the variables utilized by Shahin, Tetyana, and Pavlo (2020), Okoye, Nwisienyi, Kenechukwu, and Obi (2019), and Oyewole et al (2013). As a result, this research seeks to address the vacuum by utilizing data on real monetary investment in financial technology instruments such as ATMs, POS, and so on, and how they influence poverty reduction in Nigeria. Furthermore, most research have focused on how financial development, financial inclusion, as well as remittances in reducing poverty; no research exists on the benefits of FinTech on poverty through public as well as private investments; consequently, this study tries to address these gaps.

# CHAPTER THREE

# METHODOLOGY

**3.1Research Design**

Research designs are used to generate a suitable basis for a study. The selection of research strategy is a critical decision in the research design method since it dictates how appropriate information for a study will be collected. However, the research procedure entails several interconnected decisions. (Sileyew, 2019)

The purpose of a good study design is to achieve internal validity while also answering the question. The Ex-post Factor Research Design is used in this study since data pertaining to both variables is secondary in nature and is accessible in the Central Bank of Nigeria statistics bulletin as it examines a data-set and searches for possible relationships between variables. It essentially refers to how we might do impact analysis on existing data.

Chapin, a student of Giddings, invested in and implemented the first ex post facto design in the social sciences area in 1937. According to Kerlinger (1964), ex post facto research is well-defined as a study in which the independent variable or variables have previously happened and the researchers begin with the observation of a dependent variable or factors. In hindsight, he examines the independent factors for probable relationships to and impacts on the dependent variable or variables. As a result, the term ex post facto refers to "from and after" when an independent variable that has already occurred is not altered. It is quasi-experimental research that investigates how an independent variable, which was present in the participants earlier in the study, effects a dependent variable (Sharma & Sohil, 2019).

## 3.2. Method of Data Collection

## The time series data utilized for this research are secondary and were taken from the Central Bank of Nigeria's Statistical Bulletin.

## 3.3. Model Specification

The study employed the following models;

This model is in line with the study carried out by Emara and Mohieldin (2021), on Beyond the Digital Dividends: Fintech and Extreme Poverty in the Middle East and Africa

Functional form of model;

HDIt = *f* (PUSIFTt PRSIFTt,,,GNIPCt, ) -------------------------------------(3.1)

Converting to econometric form by including the constant term (α0) and error term (µt)

HDIt = α0 + α1PUSIFTt + a2PRSIFTt + α3GNIPCt + µt----------------------(3.2)

Where;

HDI = Human Development Index

GNIPC = Gross National Income Per Capita (Control variable)

PUSIFT = Public sector investment in Financial Technology

PRSFIT = Private sector investment in Financial Technology

α0 = Constant Term

α1 – α2, b1-b2  = Coefficients of Predictors

µt, et = Error Terms

t = Time

.

*Apriori Expectation*

The explanatory factors are projected to have a positive link with the Nigerian human development index based on theories as well as empirical investigations.

Thus: α1, α2, >0 for model one, while b1, b2, <0 for model two.

**3.4.**  **Operational Measures of Variables**

 The purpose of research is to help the general public. The population is made up of the economic variables included in this study, which include public sector FINTECH investment, private sector FINTECH investment, and Nigeria's human development index.

Predicted Variable:

The Human Development Index (HDI): When analyzing a nation's development, the HDI emphasizes that persons and their capacities rather than economic growth as a stand-alone factor. The HDI is a summary metric for fundamental human development accomplishment levels. (PWC, 2016). Ilori has selected human development as a measure for poverty reduction (2020). As HDI increases, the rate of poverty reduction increases (Prasetyo & Thomas, 2021).

Predictor Variables:

PUSIFT (Public Sector Investment in Financial Technology): This word refers to the total amount of money spent on financial technology by the government throughout the research period.

PRSIFT (Private Sector Investment in Financial Technology): This term refers to the entire monetary amount of private investment in financial technology within the scope of this study. Financial technology investments in Nigeria are measured using the public sector investment in financial technology (PUSIFT) and the private sector investment in financial technology (PRSIFT) measures.

Control Variable: A variable that is not pertinent to the study's objectives but is controlled since it may influence the outcomes (Bhandari, 2022). In this study, the control variable is Gross National Income Per Capita (GNIPC). GNP is described as GDP plus net foreign receipts of employee compensation, net taxes and property income, less production subsidies (Paliova et al., 2019).

**3.5. Data Analysis Techniques**

For analysis, we used the Johansen Cointegration Testin this study. This analytical tool was chosen to test the long run relationship between the dependent variable and independent variables. Furthermore, the vector error correction model (VEC)will also be utilized as the goal of the study is to examine a relationship effect; utilizing the Eviews and SPSS statistical software.

**CHAPTER FOUR**

#  RESULTS AND DISCUSSION

## 4.1. Introduction

The section captures data presentation and examination of the secondary data employed in attaining the set purposes of this study. The data presented in this chapter determines the association between Financial Technology Investments and Poverty Reduction in Nigeria. The results analysed in this research were shown using graphs and tables. Descriptive statistics, normality test, unit root test and hypotheses testing were carried out in this study.

## 4.2. Data presentation

The data use for this study were extracted from Central Bank of Nigeria (CBN) covering 40years. The data variables extracted are Human development index (HDI), Public Sector Investment in Financial technology (PUSFIT), and Private Sector Investment in Financial Technology (PRSIFT) while Gross National Income Per Capita (GNIPC) was used as a control variable. The data is attached as appendix A.

##

## 4.3 Data Analysis

**4.3.1 Descriptive Statistics**

### Table 4.1. Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  Variable | HDI | LPRSIFT | LPUSIFT | LGNIPC |
|  Mean |  0.445225 |  1.942322 |  0.450321 |  2.995227 |
|  Median |  0.458000 |  2.530312 |  0.906164 |  2.986772 |
|  Maximum |  0.534000 |  3.558597 |  1.954377 |  3.468347 |
|  Minimum |  0.322000 | -0.622330 | -1.497573 |  2.491362 |
|  Std. Dev. |  0.066422 |  1.509655 |  1.092186 |  0.305819 |
|  Observations |  40 |  40 |  40 |  40 |

*Source: Computed by the Author, 2022*

Evidence from Table 4.1 indicated that the average value for Human Development Index (HDI) is 0.445225. The standard deviation of 0.066422 affirms the assertion that the data is to a very good point dispersed around the mean. The Minimum and maximum values of 0.534000 and 0.322000 were also shown for the same variable.

Private sector investment in financial technology showed a mean value of 1.942322 as indicated in table 4.1. The standard deviation of 1.509655 confirms that the data is to a very good point dispersed around the mean. The Minimum value of -0622330 and maximum of 3.558597 were also shown for the same variable.

Also, the public sector investment in financial technology showed a mean value of 0.450321 as indicated in table 4.1. The standard deviation of 1.092186 confirms that the data is well dispersed around the mean. The minimum and maximum values of -1.497573 and 1.954377 were also indicated for the same variable.

The Gross National Income Per Capita (GNIPC) as a control variable in the model, indicated a mean value of 2.995227, as indicated in table 4.1. The standard deviation of 0.305819 indicates that the data is well dispersed around the mean. The minimum and maximum values of 2.491362 and 3.468347 were also indicted for the same variables.

###  4.3.2. Normality Test

The test for normality in this study was carried out by employing the Kolmogorov-Smirnov test as contained Table 4. 2.

**Table 4.2** **Tests of Normality**

Kolmogorov-Smirnova

|  |  |  |  |
| --- | --- | --- | --- |
|  | Statistic | Df | Sig. |
| LHDI | .122 | .40 | .139 |

|  |
| --- |
| 1. Lilliefors Significance Correction

*Source: Computed by the Author, 2022* |

Statistical evidence from Table 4.2 showed that statistic value for human development index from the Kolmogorov- Smirnov test is 0.122 with a probability value of 0.139. This is above 0.05 indicating that the data-set is normally distributed and is suitable for further investigation.

### 4.3.3 Test for outliers

The study used the box plot for the test of outliers as represented in figure 4.2. The box plot showed that there is no outlier that can undermine the result of this study. Again, this confirms that the data-set is suitable for further investigation.



*Figure 4.1* *Box plot showing test for outliers for the dependent variable in our study.*

*Source: Chattered by the Author 2022*

### 4.3.4. Unit root Test

Table 4.3 Unit root test (Augmented Dick Fuller)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Test Statistic | 10% | 5% | 1% | Order of integration |
| HDI | -8.794019 | \*\*\* | \*\* | \* | I(I) |
| LPUSIFT | -8.073762 | \*\*\* | \*\* | \* | I(I) |
| LPRSIFT | -7.786075 | \*\*\* | \*\* | \* | I(I) |
| LGNIPC | -5.881337 | \*\*\* | \*\* | \* | I(I) |

*Note: \*\*\* denote significant at 10%., \*\*\* denote significant at 5%, \* denote significant at 1%*

*Source: Computed by the Author, 2022*

The regression coefficient of non-stationary data will be deceptive, according to Granger & Newbold (1974) and Granger (1986). To determine the stationarity of the data variables in our investigation, we used the augmented Dickey–Fuller (ADF) unit root test. The time series variables in Table 4.3 are all stationary at the first difference (i.e., I (I)). This indicates that the data-set is suitable for further investigation and that the findings will not be distorted.

### 4.3.5 Cointegration Test

|  |  |
| --- | --- |
| Table 4.4 Johansen cointegration test(Trace statistic)Unrestricted Cointegration Rank Test (Trace) |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Trace | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* |  0.593468 |  70.19243 |  47.85613 |  0.0001 |
| At most 1 \* |  0.371773 |  35.98893 |  29.79707 |  0.0085 |
| At most 2 \* |  0.256097 |  18.32451 |  15.49471 |  0.0182 |
| At most 3 \* |  0.170041 |  7.082404 |  3.841466 |  0.0078 |
|  |  |  |  |  |
|  |  |  |  |  |
|  Trace test indicates 4 cointegrating eqn(s) at the 0.05 level |
|  \* denotes rejection of the hypothesis at the 0.05 level |
|  \*\*MacKinnon-Haug-Michelis (1999) p-value*Source: Computed by the Author, 2022* |  |

Table 4.5 Johansen cointegration test (Max-Eigen Statistic)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Max-Eigen | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* |  0.593468 |  34.20350 |  27.58434 |  0.0061 |
| At most 1 |  0.371773 |  17.66442 |  21.13162 |  0.1429 |
| At most 2 |  0.256097 |  11.24211 |  14.26460 |  0.1425 |
| At most 3 \* |  0.170041 |  7.082404 |  3.841466 |  0.0078 |
|  |  |  |  |  |
|  |  |  |  |  |
|  Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level |
|  \* denotes rejection of the hypothesis at the 0.05 level |
|  \*\*MacKinnon-Haug-Michelis (1999) p-values |  |
|  |  |  |  |  |

*Source: Computed by the Author, 2022*

Evidence from table 4.4 Johansen cointegration table indicates that there is a cointegration among the variables in our study. The above claim is confirmed from the trace statistic value of 70.19 which is higher than 47.85 critical value. The value is also found to be significant at five percent (1%) levels.

Also, the trace statistic value of 35.98 is higher than critical value of 29.79 and the value is also significant at five percent level. In addition, the trace statistic value of 18.32 is higher than critical value of 15.49, this also is evidence of cointegration. Again, the trace statistic value of 7.08 is also higher than the critical value of 3.84. This also implies that there is evidence of cointegration. Meaning that at least there about four integrating equations.

Therefore, we reject the null hypothesis and conclude that there is a cointegration between the variables in our study.

From the result as contained in Table 4.4, this study concludes that there is a long run association among the variables in our study. Meaning that these variables can be combined in a linear fashion, going forward, if there is a short run moment, it may affect individual variable in the short run but there will be long convergence.

### 4.4. Discussion of Result

### Regression Results

### Dependent Variable: LHDI

Method: Vector Error Correction Model (VEC)

Sample: 1981- 2020

 Table 4.6 Normalized long–run VEC estimates, and the error correction terms

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | LHDI | LPUSIFT | LPRSIFT | LGNIPC | C |
|  | 1 |  0.051214 | -0.079009 |  0.011754 |  0.452679 |
|  |  |  (0.01085)\*\* |  (0.00914)\*\*\* |  (0.01458)\*\* |  |
|  |  | [ 4.72116] | [-8.64767] | [ 0.80632] |  |
|  | D(LHDI) | D(LPUSIFT) | D(LPRSIFT) | D(LGNIPC) |  |
| Error | -1.256727 | -4.737817 | -5.009298 |  0.763388 |  |
| Correction |  (0.22097) |  (3.59404) |  (2.90907) |  (0.59686) |  |
| Term | [-5.68727] | [-1.31824] | [-1.72196] | [ 1.27900] |  |
| R-squared | 0.853939 |
| Adjusted R-squared | 0.841767 |
| F-statistic | 70.15732 |
| Prob(F-statistic) | 0.000000 |
|     Durbin-Watson stat | 1.384219 |

*Note: The coefficients of each variable come first; numbers in parentheses are standard errors; and the numbers in squared brackets are the z statistics. \*\* and \*\*\* denote significance at 5% and 1%, respectively*.

*Source: Computed by the Author, 2022*

Results shown in Table 4.6, reveals the relationship between financial technology investments indicators and Human Development Index as a metrics for poverty level in Nigeria. The result illustrates the overall statistical significance of the model with the F statistic = 70.15732 with a probability value of 0.000000 <0.05 and it confirms the appropriateness of the model specification. This signifies that financial technology investment has both positive and significant relationship on poverty reduction in Nigeria. Thus, it is assumed that a rise in HDI due the investments in financial technology with all things being equal will bring about a reduction in poverty level.

The adjusted R-squared of multiple determination of 0.841767 indicate that about 84.1% of the total variations observed in human development index (HDI) is explained by changes in the predictor variables (Public Sector investment in financial technology and Private Sector investment in financial technology). The Durbin Watson statistics of 1.3 84219indicates there is no auto-correlation.

### Statistical evidence from Table 4.6 indicated that public sector investment in financial technology has a normalized long-run estimate of 0.051214. This infers that it has a negative impact on poverty reduction (LHDI) in Nigeria, indicating that an increase in Public Sector Investment in Financial Technology (PUSIFT) will lead to a decrease in poverty reduction (LHDI) in Nigeria. In addition, the probability coefficient value of 0.01085 was shown for the same variator bee is significant at 5% significance level, this means that PUSIFT has a negative but significant influence on Poverty reduction (LHDI) in Nigeria. Our finding with the study of Appiah-Otoo and Song (2021). They found that financial technology through credit and third-party payment, using panel data spanning seven years, reduced poverty in China by supporting financial technology advancement and financial inclusion. Therefore, an increase in government investments in financial technology leading to an inclusive economy will decrease poverty reduction (LHDI) in Nigeria, thereby causing an increase in poverty levels in the country. This demonstrates the lack of government support and investment in financial technology as an investment in FinTech is mostly by foreign private investors. Therefore, the government is to encourage and invest in financial technology in every manner it can.

The statistical result from Table 4.6 shows that private sector investment in financial technology has a normalized long-run estimate of -0.079009. This infers that it has a positive impact on poverty reduction (LHDI) in Nigeria, indicating that an increase in private sector investment in financial technology (PRSIFT) will increase poverty reduction (LHDI). In addition, the probability coefficient value of 0.00914 was shown for the same variable to be significant at 1% significance level. This means that PRSIFT has a positive and significant influence on the human development index in Nigeria. This corroborates with the findings of Chen and Zhao (2021), as they matched digital financial indexes through financial technology of the prefectural-level cities with microdata in rural households on absolute and relative poverty in China and found that financial technology reduces poverty. Therefore, an increase in investments in financial technology from the private will lead to an increase in poverty reduction (LHDI) in Nigeria.

### Gross national Income Per Capita (GNIPC) has a negative relationship with poverty reduction (LHDI) in Nigeria, as indicated in the normalized long-run estimate of 0.011754 with a probability value of 0.01458 at 5% significance level. This means that as a control variable, it is negative but statistically significant in influencing the tested variable in the study.

### 4.5 Test of Hypothesis

Test of Hypothesis One

 As shown in Table 4.6, the normalized long-run estimate of 0.051214 with the Z-value of 0.01085 showed that the predictor variable in this study (PUSIFT) is a significant determinant of poverty reduction (LHDI) in Nigeria.

‌Therefore, this study rejected the null hypothesis and concludes that there is a significant relationship between public sector investment in financial technology and poverty reduction (LHDI) in Nigeria.

Test of Hypothesis Two

As shown in Table 4.6 the normalized long-run estimate of -0.079009 with the Z-value of 0.00914 showed that the predictor variable in this study is a significant determinants poverty reduction (LHDI) in Nigeria.

Therefore, this study rejected the null hypothesis and concludes that there is a significant relationship between private sector investment in financial technology and human development index in Nigeria.

**CHAPTER FIVE**

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

# 5.1. Introduction

This section sums-up the research carried out, it is organised into; summary of findings, conclusion, recommendations contribution to knowledge, limitations to the study and recommendations for further research.

## 5.2. Summary

This work was motivated by the objective to analyse the influence of financial technology investments on poverty reduction in Nigeria. In pursuance of stated objective an in-depth knowledge of financial technology and poverty reduction was carried out, the study reviewed related literatures on the subject matter by various scholars. The study also addressed the context of the report, its problem statement, its research goals, the research problems, the research theory, the nature of the analysis, the study's aim and relevance in the first section of the study.

The study relies on quantitative data to address the research questions posed in the first part of this dissertation. The study adapted two variables which were used in analysing financial technology investment they include; public sector investment in financial technology (PUSIFT) and private sector investment in financial technology (PRSIFT). Human Development Index (HDI) was utilized as a metric for poverty reduction (Prasetyo & Thomas, 2021). Secondary source of data was explored in this investigation from the Central Bank of Nigeria (CBN) statistical bulletin. The secondary data involved spanned from the year 1981-2020 (40 years).

The data collected were analysed with the help of cointegration method. The data analysed as well as hypotheses testing were presented in tables and graphs. Descriptive statistics was explored in analysing the variables in the study as preliminary analysis. Thereafter, discussion of results was done on the test conducted. Finally, the summary, conclusion and recommendation on the study were done.

## 5.3 Summary of Findings

This section shows the findings discovered in the course of this research work, both empirical and theoretical findings.

### 5.3.1 Theoretical Findings

A theoretical viewpoint has been explored from literatures reviewed with an emphasis on progressive social theory and Innovation Diffusion Theory (IDT) on the impact of investments in financial technology on reducing poverty.

1. According to progressive social theory, it is not individuals who cause poverty, but rather the economic, political, and social institutions that limit people's income and well-being opportunities and resources. Individuals might work incredibly hard and have favourable attitude but somewhat slip into poverty as an effect of failing social and economic structures, it was noted. Poverty is produced by economic, social, and political factors that force the depraved to fall behind, irrespective of how dedicated they are (Bradshaw & Main, 2016). Nigeria's government actions and strategies intensify poverty. These initiatives may have high aspirations, but poor execution may leave citizens depraved. As a result, integrating financial technology in poverty-reduction initiatives and policies is crucial, as are investments in it by both the government and private sector. However, not only should the government make monetary investments in financial technology, but it should also make supervisory investments in this technology to assure proper execution of financial technology laws aimed at reducing poverty in the country. This is consistent with our results that public sector investment in financial technology is negatively associated to the human development index, since a decrease in HDI leads to a decrease in poverty reduction in Nigeria.

2. Finally, diffusion, as defined by Roger (2003)'s Invention Diffusion Theory, deals with the process that an innovation gets widespread over time within the social system. As a result of our findings on the positive impact of private sector investments in financial technology innovation on poverty reduction, if the government and all citizens in the country can incorporate financial technology into the social system and capitalize on its positive potential by investing more in it, poverty will be reduced. People will eventually adapt to the usage of this technology, allowing them simple access to finances and financial services that will allow them to afford the requirements of life and achieve a socially acceptable quality of living. As a result, poverty will be at an all-time low.

**5.3.2. Empirical Findings**

This study critically examined the relationship between financial technology investments using public and private sector investments as metrics and poverty reduction using Human Development Index as a metric. The result of the study shows a positive significant relationship which financial technology investments from the private sector has on poverty reduction. Therefore, the empirical findings of this work are as follows;

1. From hypothesis one, it was found that public sector investments in financial technology is negative but significant with Human Development Index in Nigeria. This finding implies that investment in financial technology by the government will increase poverty due to very low investments in FinTech and poor implementation of financial technology strategies for poverty reduction in Nigeria. This result negates with the study of Appiah-Otoo and Song (2021), they discovered a positive and significant relationship between financial technology (fintech) and poverty reduction when they looked at the direct and indirect effects of financial technology (fintech) as a standalone and its sub-measures of credit and third-party payment on poverty measured by household per capita consumption.

2. The second hypothesis tested in this study shows there is a positive and significant relationship between private sector investment in financial technology and Human Development Index in Nigeria. This finding implies that investment in financial technology by individuals or private is significant in aiding poverty reduction in Nigeria. The result corroborates with the findings of Chen and Zhao (2021) on their research of the influence of digital financial indicators on absolute and relative poverty in prefectural-level cities using microdata from rural families. They discovered a favourable and substantial link between FinTech-enabled digital finance and poverty reduction.

## 5.4. Conclusion

The influence of financial technology investments on poverty reduction in Nigeria was experimentally studied in this research, which focused on the examination of outcomes. The study showed that only private sector investment in financial technology impacted positively and significantly on poverty reduction which was measured by Human Development Index in Nigeria. Therefore, the study concludes that financial technology investment is an important driver in poverty reduction in Nigeria, this alludes with previous studies of Chen and Zhao (2021) and Appiah-Otoo and Song (2021), as they found a positive and significant relationship between financial technology and poverty reduction. This conclusion also corroborates with the theory of Innovation Diffusion Theory which, according to Roger (2003), alludes that diffusion is the process by which an innovation gets popularized through social system overtime. Hence, financial technology should be incorporated into policies and the social system to enable the poor have easy access to finance and its support services thereby, alleviating poverty overtime.

## 5.5. Recommendation

The following suggestions were made on the basis of the above findings;

1. The government should spend more in financial technology since investment on FinTech by them is very low, by developing more financial technology infrastructures throughout the country, particularly in rural regions. Financial technology will also be incorporated into their poverty intervention programs, as it helps to reduce poverty. Also, government and policymakers should intensify education on financial technology and ICT to aid the increase in adoption of FinTech.

2. The government should enact policies that encourage private sector investment in financial technology and provide funding for FinTech start-ups, as this will allow citizens to benefit from lower costs while capitalizing on perceived positive gains from private sector investments in financial technology. Finally, through working with civic society, the commercial sector, and the public sector to prioritize increase in financial technology investments in order to accelerate the growth of FinTech in the country.

##  5.6. Contribution to Knowledge

In light of the findings of this research, the following contribution has been made to empirical studies of authors of Financial Technology and poverty reduction;

1.This study incorporated public and private sector investments in financial technology as metric for financial technology investments and Human Development Index as poverty metrics giving insights on the investment potential of financial technology in reducing poverty.

2.This study also contributed to the existing knowledge of financial technology investment by the government as well as the private sector and how vast its potentials are in resolving issues in the country's financial and economic sector, particularly in terms of poverty reduction. It has truly given the government the insight on the importance of investing in financial technology. Thereby prompting the government to add financial technology into schemes and intervention programs that will aid in achieving the SDG goal of poverty reduction in Nigeria.

## 5.7. Limitations of Study

 This study has some limitations;

1.The study focused on Nigeria, however, FinTech is a global phenomenon.

2. A variety of variables are used as proxies of financial technology and poverty reduction, but this study focused on the investments of Financial Technology and Human Development Index for poverty reduction, other variable could be tested to boost the outcomes of the study.

3. Coinyegration method was utilized for the study whilst there are other analytical techniques that could be employed.

4. Also, a time series data spanning between the year 1981-2020 was employed, other forms of data and a more recent one could be employed.

## 5.8. Suggestions for Further Study

The influence of financial technology investment on poverty reduction was investigated in this study. Nigeria's scope might be expanded in the future over a 40-year period (1981-2020). In view that only secondary data was employed in this study, further studies could employ both primary and secondary data. Finally, further experiments related to this analysis should provide additional variables other than those utilized in the study.

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##

## APPENDIX

## Appendix A

**Data extracted from Central Bank of Nigeria (CBN) statistical bulletin.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **YEAR** | **HDI** | **PUSIFT** | **PRSIFT** | **LGNIPC** |
| 1981 | 0.397 | 0.0324 | 0.2386 | 2.986771734 |
| 1982 | 0.356 | 0.0368 | 0.7744 | 3.100370545 |
| 1983 | 0.325 | 0.0318 | 0.6957 | 3.161368002 |
| 1984 | 0.363 | 0.039 | 0.734 | 3.053078443 |
| 1985 | 0.423 | 0.0507 | 0.7682 | 2.986771734 |
| 1986 | 0.393 | 0.0515 | 1.2825 | 2.897627091 |
| 1987 | 0.38 | 0.1806 | 0.6274 | 2.851258349 |
| 1988 | 0.371 | 0.2272 | 0.607 | 2.832508913 |
| 1989 | 0.378 | 0.2952 | 0.6515 | 2.740362689 |
| 1990 | 0.322 | 0.2878 | 1.122 | 2.748188027 |
| 1991 | 0.328 | 0.2386 | 1.3776 | 2.707570176 |
| 1992 | 0.348 | 0.5524 | 1.9604 | 2.707570176 |
| 1993 | 0.389 | 2.027 | 5.3189 | 2.556302501 |
| 1994 | 0.384 | 0.4455 | 33.9899 | 2.491361694 |
| 1995 | 0.453 | 1.0809 | 29.6857 | 2.491361694 |
| 1996 | 0.393 | 2.0685 | 15.8872 | 2.591064607 |
| 1997 | 0.456 | 1.5791 | 237.8084 | 2.643452676 |
| 1998 | 0.439 | 1.9215 | 96.3637 | 2.643452676 |
| 1999 | 0.455 | 11.1218 | 132.5036 | 2.662757832 |
| 2000 | 0.462 | 3.0347 | 268.3825 | 2.672097858 |
| 2001 | 0.46 | 33.9334 | 428.4201 | 2.72427587 |
| 2002 | 0.466 | 29.3871 | 564.4252 | 2.799340549 |
| 2003 | 0.445 | 22.679 | 723.1769 | 2.851258349 |
| 2004 | 0.463 | 8.0722 | 956.9878 | 2.939519253 |
| 2005 | 0.477 | 8.0415 | 1377.152 | 3.012837225 |
| 2006 | 0.477 | 9.7723 | 1724.9485 | 3.130333768 |
| 2007 | 0.481 | 32.1609 | 3619.0699 | 3.206825876 |
| 2008 | 0.492 | 67.3855 | 2622.1194 | 3.294466226 |
| 2009 | 0.492 | 90.0279 | 2134.8714 | 3.311753861 |
| 2010 | 0.5 | 42.406 | 1681.2927 | 3.33243846 |
| 2011 | 0.507 | 13.1 | 1325.4469 | 3.338456494 |
| 2012 | 0.514 | 23.2 | 1870.0778 | 3.387389826 |
| 2013 | 0.521 | 18.5149 | 2183.8551 | 3.42975228 |
| 2014 | 0.525 | 18.3 | 3437.523 | 3.46834733 |
| 2015 | 0.527 | 24.385 | 2959.8302 | 3.450249108 |
| 2016 | 0.53 | 20.5677 | 2978.43 | 3.385606274 |
| 2017 | 0.526 | 29.9738 | 2498.9634 | 3.320146286 |
| 2018 | 0.534 | 30.4714 | 2074.933 | 3.292256071 |
| 2019 | 0.527 | 24.385 | 2959.8302 | 3.307496038 |
| 2020 | 0.53 | 20.5677 | 2978.43 | 3.301029996 |

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## Appendix B

**Descriptive statistics of the data variables in our study**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | HDI | LPRSIFT | LPUSIFT | LGNIPC |
|  Mean |  0.445225 |  1.942322 |  0.450321 |  2.995227 |
|  Median |  0.458000 |  2.530312 |  0.906164 |  2.986772 |
|  Maximum |  0.534000 |  3.558597 |  1.954377 |  3.468347 |
|  Minimum |  0.322000 | -0.622330 | -1.497573 |  2.491362 |
|  Std. Dev. |  0.066422 |  1.509655 |  1.092186 |  0.305819 |
|  Observations |  40 |  40 |  40 |  40 |

**Appendix C**

**Test of Normality**

|  |  |
| --- | --- |
|  | Kolmogorov-Smirnova |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Statistic | Df | Sig. |
| LHDI | .122 | .40 | .139 |

|  |
| --- |
| 1. Lilliefors Significance Correction

*Source: Computed by the Author, 2022* |

**Appendix D**

**Unit root test**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Test Statistic | 10% | 5% | 1% | Order of integration |
| HDI | -8.794019 | \*\*\* | \*\* | \* | I(I) |
| LPUSIFT | -8.073762 | \*\*\* | \*\* | \* | I(I) |
| LPRSIFT | -7.786075 | \*\*\* | \*\* | \* | I(I) |
| LGNIPC | -5.881337 | \*\*\* | \*\* | \* | I(I) |

*Source: Computed by the Author, 2022*

**Appendix E**

**Test for Outliers**



*Box plot showing test for outliers for the dependent variable in our study*

*Source: Computed by the Author, 2022*

## Appendix F

|  |  |
| --- | --- |
| **Cointegration Test**Unrestricted Cointegration Rank Test (Trace) |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypthesized |  | Trace | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* |  0.593468 |  70.19243 |  47.85613 |  0.0001 |
| At most 1 \* |  0.371773 |  35.98893 |  29.79707 |  0.0085 |
| At most 2 \* |  0.256097 |  18.32451 |  15.49471 |  0.0182 |
| At most 3 \* |  0.170041 |  7.082404 |  3.841466 |  0.0078 |
|  |  |  |  |  |
|  |  |  |  |  |
|  Trace test indicates 4 cointegrating eqn(s) at the 0.05 level |
|  \* denotes rejection of the hypothesis at the 0.05 level |
|  \*\*MacKinnon-Haug-Michelis (1999) p-value*Source: Computed by the Author, 2022* |  |

Table 4.5 Johansen cointegration test (Max-Eigen Statistic)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Max-Eigen | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* |  0.593468 |  34.20350 |  27.58434 |  0.0061 |
| At most 1 |  0.371773 |  17.66442 |  21.13162 |  0.1429 |
| At most 2 |  0.256097 |  11.24211 |  14.26460 |  0.1425 |
| At most 3 \* |  0.170041 |  7.082404 |  3.841466 |  0.0078 |
|  |  |  |  |  |
|  |  |  |  |  |
|  Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level |
|  \* denotes rejection of the hypothesis at the 0.05 level |
|  \*\*MacKinnon-Haug-Michelis (1999) p-values |  |
|  |  |  |  |  |

*Source: Computed by the Author, 2022*

**Appendix G**

**Vector Error Correction Model (VEC) Test**

Normalized long–run VEC estimates, and the error correction terms

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | LHDI | LPUSIFT | LPRSIFT | LGNIPC | C |
|  | 1 |  0.051214 | -0.079009 |  0.011754 |  0.452679 |
|  |  |  (0.01085)\*\* |  (0.00914)\*\*\* |  (0.01458)\*\* |  |
|  |  | [ 4.72116] | [-8.64767] | [ 0.80632] |  |
|  | D(LHDI) | D(LPUSIFT) | D(LPRSIFT) | D(LGNIPC) |  |
| Error | -1.256727 | -4.737817 | -5.009298 |  0.763388 |  |
| Correction |  (0.22097) |  (3.59404) |  (2.90907) |  (0.59686) |  |
| Term | [-5.68727] | [-1.31824] | [-1.72196] | [ 1.27900] |  |
|  |  |  |  |  |  |
| R-squared | 0.853939 |
| Adjusted R-squared | 0.841767 |
| F-statistic | 70.15732 |
| Prob(F-statistic) | 0.000000 |
|     Durbin-Watson stat | 1.384219 |

*Note: The coefficients of each variable come first; numbers in parentheses are standard errors; and the numbers in squared brackets are the z statistics. \*\* and \*\*\* denote significance at 5% and 1%, respectively*

*Source: Computed by the Author, 2022*