Effect of Financial Innovation and Inclusion on Micro, Small and Medium Enterprises (MSMEs) Development in Nigeria

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Abstract
This study examined the effects of financial innovation and inclusion on the development of Micro, Small and Medium Enterprises (MSMEs) in Nigeria. The National Policy on MSMEs has been in place since 2003, and the Central Bank of Nigeria has continued to leverage on information technology in reforming Nigeria's payment system especially as it pertains the financially excluded persons. This work studied the contributions of financial innovations and inclusion on development of the MSMSEs in Nigeria; and specifically to: determine the contribution of financial innovation to the development of MSMEs in Nigeria; and determine the contribution of financial inclusion to the development of MSMEs in Nigeria. Data were sourced from National Bureau of Statistics and Central Bank of Nigeria Statistical bulletins. A control variable (interest rate) was included in the models. A multiple regression (OLS) model was therefore utilized. The data were tested for stationarity using the Augmented - Dickey-Fuller (ADF) tests. For Normality test was conducted using Jarque-Bera statistic. The study found that between 2010 - 2019, financial innovation had negative and no significant contributions to MSMEs development in Nigeria; and that financial inclusion had positive and no significant relationship with the development of MSMEs in Nigeria. The study recommended among others that since MSMEs can only afford low loan amounts this profoundly limits their ability to expand and diversify their investments in a way that would guarantee both continued growth and innovation; the government through the banks and Central Bank of Nigeria should package integrated value chain loan facilities for the MSMEs in order to enhance the innovativeness and development of MSMEs in Nigeria; that the digitizing of payments across the country should be prioritized; and that continuous user's education and sustenance of agency banking policy will ease adoption process of the financial technology even among the MSMEs.
Keywords: Financial Innovation, Financial Inclusion, Financial system, SMEs

I. Introduction

Knowledge is power. Information promotes knowledge sharing and reduces cost of transaction and promotes "win-win" contractual relationships by mitigating information asymmetrical challenges in financial transactions. This calls for sound financial system in any economy. Financial system consists of the mechanism or arrangement through which funds are generated, collected, transferred, and managed to promote economic activities of a nation. The structure conceptually will revolve around: lenders and savers of money; financial markets; financial intermediaries including regulations and supervisors; and borrowers of money or net spenders of money. Thus, financial system plays a key role in fostering economic growth by efficiently channelling the funds to investments. However, financial system can be considered a source of instability especially if not progressive and efficient in operation. Thus, the extent of mobilizing financial resources from the surplus sector and lend to the deficit outlets to facilitate business transactions and economic development has much to do with the monetary and fiscal policies of the nation. Financial innovation and inclusion are issues to be progressive promoted in a good financial system.

Financial innovation in limited sense is all about providing essential banking services and products on the platform of information and communication technology (ICT). In broader sense, it entails financial development aimed at improving quantity, quality and efficiency of financial intermediaries' services by

disruptive ideas and products empowered by information and communication technology. Financial innovation will enhance financial deepening, financial penetration and economic development (Agboola, 2006).

Financial innovation is the act of creating and popularising fresh monetary instruments as well as fresh monetary technologies, institutions and markets. It encompasses institutional, product and process innovations (Alvarez, 2009). Institutional innovations relate to the creation of new types of financial firms such as internet banks, auto branches and discount broking firms. Product innovation has to do with new products such as derivatives, securitized asset and mortgages. Process innovations relate to new ways of conducting financial business including online banking, mobile phone banking and new ways of implementing information technology.

Central Bank of Nigeria's main mandate is the development of Nigeria Financial System aside from licensing, regulating and controlling the banks. She is therefore interested in financial deepening, financial inclusion, as well as financial penetration efforts of the financial institutions including banks through their financial innovation products and services. The Fintech companies are inclusive.

Financial inclusion is the provision of a broad range of high quality financial products such as savings, credit, insurance, payments and pensions, which are relevant, appropriate and affordable for the entire adult population especially the low income segments of the economy. Financial inclusion has been described as ensuring access to formal financial services at an affordable cost in a fair and transparent manner (Financial Access, 2009). Financial inclusion simply implies enabling access to financial resource and services for economic agents, especially, those on the lower wrung of the income ladder at an affordable cost.

Strategies for financial inclusion in banks aim at increasing the number of people with accounts in banks and other formal financial institutions savings, current and credit. It also pursues the promotion of the use of formal payment media, including, ATM, internet payments, mobile payments and others by the populace.

The financial inclusion strategy document by the Central Bank of Nigeria states that "financial inclusion is achieved when adult Nigerians have easy access to a broad range of formal financial services that meet their needs at affordable cost". Although there has been progress over time in the extent of financial inclusion in Nigeria, the country still lags in many of the indicators of inclusion. In the period from 2008 to 2016 the percentage of completely financial excluded people fell from 53% to 41.6%, while those served by the informal sector fell from 24% to 17%. At the same time, formal other doubled from 3% to 6% and formally banked rose from 21% to 30%" (CBN, 2016).

Small and Medium Size Enterprises (SMEs) supportive role in promoting grassroots economic growth and equitable sustainable development is becoming obvious. SMEs have become more important in the economic matrixes in recent years across the globe through increased deliberate government policies and legislation aimed at nurturing SMEs as engines of economic growth and employment creation. It is estimated that SMEs constitute over 90 percent of total enterprises in most economies with a high rate of employment growth. In Africa, economic powerhouses such as South Africa, Egypt, Nigeria and Kenya, the SMEs sector is estimated to contribute over 95 percent in employment and 45-50 percent contribution to Gross Domestic Product (GDP) but contribute less than four percent to export earnings (United Nations, 2016).

Financial innovations and inclusions are important vehicles through which banking institutions can turn around development in SMEs and lead to significant positive change in business performance. Thus, we propose that development of SMEs for more relevance and improved contribution to GDP depends on adequate financial innovations and good financial inclusion. Of course, availability and accessibility of finance has been identified in several business surveys as the most important factor determining the survival and growth of small and medium sized enterprises in both developing and developed countries. Access to finance allows SMEs to undertake productive investments to expand their businesses and to acquire the latest technologies, thus ensuring their competitiveness and that of the nation as a whole. Poorly functioning financial systems can seriously undermine the microeconomic fundamentals of a country, resulting in lower growth in income and employment. Suitable tailored products that ensure a "win-win situation" for both financial institutions and SMEs are therefore important in ensuring profitability and attainment of business goals for both financial institutions and SMEs.

Nigeria banks have traditionally lent overwhelmingly to the government, which offered less risk and higher returns. Such practices have crowded out most private sector borrowers and increased the cost of capital for them. Nevertheless, financial sector has been faced with revolutionary change that has resulted to increased innovations, leading to a shift from traditional ways of doing banking to more innovative and customer focused process. Revolutionary banking has seen SMEs that were previously regarded as unbankable being a key target market for banking institutions. Among such financial innovations as noted by Nyangosi (2008) are mobile banking, branchless banking, and electronic banking and SME tailored credit facilities and bank accounts that were previously non-existent. Many researchers focused on challenges faced by SMEs that hinders growth of SMEs as well as technology adoption challenges. This work explores the effect of financial innovation and inclusion on the development of SMEs in Nigeria considering the numerous financial products and services as a

result of technology advancement. Specifically, this work determined the contribution of financial innovation to the development of SMEs in Nigeria; and the contribution of financial inclusion to the development of SMEs in Nigeria. The hypotheses were that: Financial innovation has no positive and significant contribution to the development of SMEs in Nigeria; financial inclusion has no positive and significant contribution to the development of SMEs in Nigeria.

The subsequent sections of this work include: conceptual review; theoretical review and empirical review of related works. Others are methodology and data presentation; discussions, conclusion and recommendations.

Conceptual reviews
Financial innovations:

Financial innovation is the act of creating and then popularizing new financial instruments as well as new financial technologies, institutions, and markets (Tufano, 2002). It involves the design, the development, and the implementation of innovative financial instruments and processes, and the formulation of creative solutions to problems in finance (Lawrence, 2010). Financial innovations can be grouped as new products (say adjustable rate mortgages; exchange-traded index funds); new services (say on-line securities trading; Internet banking); new "production" processes (say electronic record-keeping for securities; credit scoring); or new organizational forms (say a new type of electronic exchange for trading securities; Internet-only banks) (Ignazio, 2007).

Beaver (2002) believes that innovation is an essential element for economic progress of a country and competitiveness of an industry. In fact, innovation is one of the most important competitive weapons and generally seen as a firm's core value capability. Innovation is also considered as an effective way to improve firm's productivity due to the resource constraint issue facing a firm (Lumpkin & Dess, 1996).

Financial Inclusion:

Aduda and Kalunda (2012) define financial inclusion as the process of ensuring access to financial products and services needed by all sections of the society in general, but particularly, the vulnerable, weaker sections and low-income groups, fairly, transparently at an affordable cost in mainstream institutional players.

World Bank (2014) defines financial inclusion as the way financially excluded and underserved people in a society have access to a range of available financial services without any discrimination. It is the process of access to and usage of diverse, convenient, affordable financial service (Nwanko & Nwanko, 2014). Sinclair (2011) defines financial exclusion as the inability to access necessary financial services in an appropriate form as a result of difficulties with access, conditions, prices or marketing or sect exclusion in response to negative perception or experience. Simply, financial exclusion is the direct opposite of financial inclusion where "active poor" and "bankable persons" of a country do not have access to financial products and services.

Financial inclusion is a financial intervention strategy that is aimed at overcoming the market challenges that hinder the poor and underprivileged from having access to financial services. Financial inclusion is the provision of wide range of financial services such as savings, insurance services, credits, remittance and payment services (Sarma & Pias, 2011).

Financial innovation and inclusion in Nigeria's banking sector:

Financial inclusion has continued to assume increasing interest among policy makers, researchers and development-oriented agencies, across the globe. Accordingly, countries are devising various regulatory strategies and frameworks to ensure that all populations excluded from financial services are reached and served. According to the CBN (2012), access to financial services mobilizes greater household savings (enabling such persons to invest in themselves and families), leverages capital for investments and expands the class of entrepreneurs. Financial inclusion offers incremental and complementary solutions to tackle poverty promote inclusive development and achieve the UN Sustainable (Millennium) Development Goals (MDGs). It aims at drawing the unbanked population into the formal financial services net so they have the opportunity to access the whole gamut of appropriate financial services. The CBN believes that "financial inclusion is achieved when adult Nigerians have easy access to a broad range of formal financial services that meet their needs at an affordable cost" (CBN, 2011). Such financial services include, but not limited to: payments, savings, loans, and insurance and pension products.

The major tools for implementing the financial inclusion strategy in Nigeria include the following: Agent Banking; Know-Your-Customer (KYC) requirements; Implementation of the Micro, Small and Medium Enterprises Development Fund; Financial Literacy; Mobile Money Operation; Consumer Protection; Credit Enhancement Programmes such as Agricultural Credit Guarantee Scheme (ACGS), Commercial Agricultural Credit Scheme (CACS), Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), Small and Medium Enterprises Credit Guarantee Scheme, and Entrepreneurship Development Centers. (Central

Bank of Nigeria, 2013). The revised National financial inclusion strategy (NFIS) in 2018 identified women, rural areas, youths, SMEs and the Northern geo-political zones as the most financially excluded; and therefore promoted massive roll out of agent banking networks; digitalization of financial transactions; development of ecosystems that support digital and electronic transactions among others (CBN, 2018).

Nigeria has also signed the Sochi Accord on "Fintech for Financial Inclusion" at the 2018 Global Policy Forum held in Sochi, Russia in September, 2018. The accord requires members of the Alliance for Financial Inclusion (AFI) Network to leverage on Fintech to accelerate financial inclusion. The AFI members resolved to *acknowledge, recognize, encourage, commend, welcome, harness and identify* that innovative, technology-based financial services hold more promises towards advancing financial inclusion, especially among vulnerable segments of the society (CBN, 2018).

Micro, Small and Medium Enterprises:

The definitions of Small and Medium Enterprises (SMEs) are usually derived in each country, based on the role of SMEs in the economy, policies and programs designed by particular agencies or institutions empowered to develop SMEs. The Central Bank of Nigeria, in its 2005 guideline on Small and Medium Enterprise Investment Scheme (SMEIS), described SME as any enterprise with a maximum asset base of 200 million naira (excluding land and working capital) with no lower or upper limit of staff. In the United States and European Union (EU) countries, SMEs are enterprises with employees fewer than 500 while in developing countries any enterprise employing below 100 employees would constitute a SMEs (UNCTAD, 2001).

As in developed economies, Nigeria with the introduction of the National Policy on MSMEs has addressed the issue of definition as to what constitutes micro, small and medium enterprises (MSMEs). The definition adopts a classification based on dual criteria: employment and assets (excluding land and buildings) as shown:

S/N	Size Category	Employment	Assets (₦ Million) (excluding land and buildings)
1	Micro enterprises	Less than 10	Less than 5
2	Small enterprises	10 to 49	5 to less than 50
3	Medium enterprises	50 to 199	50 to less than 500

Note: If there exists a conflict on classification between employment and assets criteria (for example, if an enterprise has assets worth seven million naira (₦7M) but employs 7 persons), the employment-based classification will take precedence and the enterprise would be regarded as micro.

The National Policy on MSMEs' special target enterprises are: Micro food processing enterprises; Cottage arts and crafts; Textiles and clothing; and Wood processing and furniture. Others are Leather and leader products; Basic metal, metal fabrication and engineering enterprises; Solid mineral enterprises; Electronic and information technology enterprises; Building and construction enterprises; and Oil and Gas related goods and services. The special target enterprises also include Entertainment enterprises; Women-owned enterprises; Youth-owned enterprises; and Special enterprises for physically challenged people, including living with HIV/AIDS.

Conceptually, there are three main sources of enterprise financing open to MSMEs in Nigeria: Formal financial institutions such as commercial banks, merchant banks, savings banks, insurance companies, microfinance banks and development banks; Informal financial institutions consisting of money lenders, landlords, credit and savings associations (co-operative societies), "esusu", friends and relations; and Personal savings.

In this study the Micro, Small and Medium Enterprises Development in Nigeria is operationalized as the contribution of the MSMEs to the Gross Domestic Product of Nigeria. The retail and wholesale sub-sector of the economy was selected to represent the MSMEs sector.

Financial inclusion and innovation measures:

The attraction for getting the deposit from the surplus sector is interest payment, which must be reasonable and acceptable to the owner of the money. Conversely, the attraction for granting credit facility by the bank is interest payment for the use of credit by the borrowers in consideration for parting with liquidity by the lenders. Therefore interest rate dictates both the level of deposit and the amount of credit being offered by the banks. Advanced retail payment transaction technologies will foster innovation and growth in the retail banking sector. This will further create more value associated with retail payment services for banks. On the other hand, if more retail payment transactions have been done through ATMs or POS instead of retail payments offices, banks can be more cost efficient and obtain more income. Innovations of retail payment services have a larger impact on bank performance in countries with a relatively high adoption of retail payment transaction technologies (Agboola, 2007). Hence the need to entice, retain and win more customers and secure their loyalty. This is the essence of the need for various modes of incentives to encourage loyalty, entice and stimulate

customers' interest, via steady and improved adoption by customers (Mbutor & Uba, 2013). A higher interest rate would make it more costly to hold cash in hands, thus giving people more incentives to adopt financial innovation.

An increase in the volume of Currency in circulation (CIC) denotes a decrease in total deposits and available loans. This is a major indicator of financial inclusion. Currency outside banks represents a proportion of the CIC outside the banking system, held by the public for transactional purposes. It is also an indicator of the level of sophistication of the payment infrastructure (financial innovation) in an economy. Currency held by banks refers to the proportion of the CIC that is held in banks' vault. It is the summation of all naira currencies held by Deposit Money Banks, Merchant Banks and Non-Interest Banks. This is a good indicator of the level of financial inclusion as it captures the volume of money that is available in the banks vault. A high volume of currency held by banks (deposits) translates to increased volume of loanable funds in the banking system. One of the major techniques or tools used to do these is financial incentive via manipulation of interest rates paid by banks to depositors.

Interest rate generally is the charge on the credits extended or price of money lent to another person. The major focus of prudential regulation in developing countries has traditionally been on credit risk. While banks and their supervisors have grappled with nonperforming loans for several decades, interest rate risk is a relatively new problem. Of course, the drop in interest rates has generated substantial trading profits for banks that had a large investment portfolio; and vice versa (Ila & Ajay, 2004). We expected positive relationship between interest rate and SME development.

Nzyuko Jagongo and Kenyanya (2018) conceptualized financial inclusion (FI) as a process which ensures easy access to financial services in an economy. According to the authors, ease of access can also be measured by proxies such as number of bank branches or ATMs per 1,000 adult populations. FI can also be operationalized in terms of accessibility, degree of usage, adaptability to, and cost of financial products.

Another way of looking at SME development is the ratio of Wholesale and retail contribution to gross domestic product (i.e. the contribution of the wholesale and retail sector to Gross Domestic Product). The wholesale and retail sector represents the SMEs in this work. Thus, increasing access to finance by the SMEs, every other things being equal will increase their contribution to the Gross domestic Product. Of course, economic growth is commonly represented by growth in Gross Domestic Product. Economic growth refers to an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. Economic growth can be measured in nominal terms, which include inflation, or in real terms, which are adjusted for inflation.

Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP. Of more importance is the growth of the ratio of GDP to population (GDP per capital, which is also called per capita income). An increase in growth caused by more efficient use of inputs (such as physical capital, population, or territory) is referred to as intensive growth. GDP growth caused only by increases in the amount of inputs available for use is called extensive growth (Acemoglu, 2007).

Basically, Gross Domestic Product is a measure of the monetary value of final goods and services— that is, those that are bought by the final user — produced in a country in a given period of time (say a quarter or a year). According the Bureau of Economic Analysis, United States Department of Commerce (2015) GDP includes market production and some nonmarket production. However, not all productive activity is included in GDP; some activities, such as the care of one's own children, unpaid volunteer work for charities, and illegal activities, are not included because data are not available to accurately measure their value. Whenever possible, GDP is valued at market prices; GDP is a measure of current production, not sales; GDP is equal to the value of goods and services for "final" user; and GDP is a "gross" measure. We expected positive relationship between the ratio of contribution of whole and retail sector to GDP and financial innovation/and inclusion.

Theoretical framework

Sustainability theory is the anchor philosophy of this paper. The theory was developed by Felix Ekardt in 1986. He described sustainability as a form of economy and society that is lasting and can be lived on a global scale. The society-changing potential of the claim: More justice between generations, more global justice – at the same time faces the problem of getting out of sight. Sustainability is just not the general claim to take social, economic, and environmental policy serious and to strike a sound balance between these aspects. Sustainability theory tries to explain the potential for long-term maintenance of well-being, which has ecological, economic, political and cultural dimensions will be in the long run.

Empirical review of related works

Nyangosi and Arora (2011) argue that financial institutions adopted different electronic distribution channels to meet the demands of customers. In their study to examine the adoption of information technology in

Kenyan banks, focusing on services provided through internet and mobile banking, they found out that inclusion of information technology in banking business was necessary to achieve excellence goal. The study further revealed that ATM technology is the most available technology while SMS banking was also found useful. Customers prefer to deposit money into a system in which they can obtain a good timely information and payment service (Kemppainen, 2003 & 2008).

Pallavi and Bharti (2013) studied role of literacy level in financial inclusion in India: Empirical Evidence. Using survey approach, the work identified the major reasons for financial exclusion. The reasons were to high cost of financial service; and non-price barriers such as documents of proof regarding person's identity, postal address, and income. World Bank (2012) also argued that more than half of the world's poor adults do not have a bank account, leaving them vulnerable to resource loss, theft and exploitation.

Kempson, Atkinson and Pilley (2004) in their work on Policy Level Response to Financial Exclusion in Developed Economies: Lessons for Developing Countries showed that in Africa, many people who have bank account do not use them, adding that "financial services accessibility is good but the best inclusive financial economy is the one in which financial service are both adequately utilized and are adequately available". Bureaucracy, travel distance and cost are some of the identified barriers to access banking and other financial services by more than half of the world's population, particularly those living in rural areas.

Hia and Shidedah, (2015) studied Financial Inclusion: Policies, Status, and Challenges in Palestine. The showed that the six types of financial exclusion scenarios, namely: Physical access exclusion occasioned by the closure of local banks or building societies branches/outlets and reliable transport to reach alternatives is lacking; Product or service access exclusion (people being denied a product or service on the basis of high risk perception); Condition exclusion due the attachment of conditions to products or services which make them inaccessible to some potential clients; Price exclusion, which occurs when products are available but at a price that is unaffordable; Marketing exclusion, where sales and marketing activity is targeted on some groups, or areas, at the expense of others; Self- exclusion, when individuals do not seek financial products and services for personal reasons including fear of failure/loss, fear of temptation or lack of awareness.

In Kenya, majority of banks have introduced internet banking, mobile banking and other e-banking facilities, to enhance delivery channels to their customers. The introduction of these products into the market does not how ever have links on profitability by banking institutions. For example, while Internet banking is fast and convenient mode of conducting banking transactions, this is yet to gain acceptance among banking consumers, due to fears of uneasiness in this mode of banking (Akhaven, 2005).

Apart from individual banks' ATMs, Kenyan Banks have formed e-banking outsourcing partnership to provide e banking solutions to their customers. These include PesaPoint limited and Kenya switch (Ken switch).Customers of banks that are members of Pesapoint can access 120 Pesapoint ATMs and those banks that are members of Kenya switch can access 152 ATMs. Those banks with membership of both Ken switch and Pesapoint have access to a minimum of

272 ATMs (Nyangosi, 2008). This increases the number of transaction and efficiency of offering financial services by the banking sector. Thus, among the innovative banks in Kenya is Equity Bank that had more ATMs (232) as at December 2007. However, only 22 out of 41 banks have their own ATMs. Kenya commercial bank and Barclay's banks have second and third rank with 19.92% and 14.7% of total ATMs in Kenya.

Hariharian and Marktanner (2012) in their work on the need for Financial Inclusion in India concluded that financial inclusion is a huge prerequisite for economic growth and development based on its ability to enhance capital creation, finance sector savings and intermediation and by implication investment. Nwanko and Nwanko (2014) also examined the sustainability of financial inclusion to rural dwellers in Nigeria using descriptive study and content analysis. The study observed that the sustainability of financial inclusion to rural dwellers in Nigeria remains the mainstream for economic growth in any country.

Waihenya (2012) investigated the relationship between agent banking and financial inclusion in Kenya. Their study utilized descriptive survey research method. The study investigated agent banking in Kenya with emphasis on the factors contributing to financial exclusion, both natural barriers such as rough terrains and man-made barriers such as high charges on financial services and limited access due to limited bank branches. The study showed that agent banking is continuously improving and growing and as it grows, the level of financial inclusion is also growing proportionately.

Ibeachu (2010) also did a comparative study of financial inclusion in Nigeria and the United Kingdom, using a deductive approach. He measured financial inclusion, accessibility and the quality of bank services in Nigeria by analyzing responses from survey questionnaires administered. From his findings, financial inclusion was more market driven in terms of consumer behaviour and customer satisfaction from the offering of financial services.

Bertram, Nwankwo and Onwuka (2016) identified full financial inclusion as a prerequisite for inclusive economic development in Nigeria. Using the descriptive survey methodology, they employed questionnaires to generate data on financial inclusion from stakeholders such as Banks, Insurance, Regulators, and Telecom firms

providing every household with access to a suite of modern financial services, including savings, credit, insurance, and payments, as well as sufficient education and support to help customers make good decisions for themselves. The study revealed that financial inclusion is a bold step towards inclusive economic development. Accordingly, they concluded that all initiatives that make formal financial services available, accessible and affordable to all segments of the population should be encouraged to achieve inclusive economic development.

Following the few reviews of related studies, this study filled data and scope gaps by unbundled financial innovations and inclusions into deposit base and interest rate. The variables were to explain the development of SMEs, and extending the period of study (2010-2019) to accommodate the effect of technological transition.

II.   Methodology

The study adopts the *ex post facto* design which is a very common and ideal method in conducting research in business and social sciences. It is mostly used when it is not possible or acceptable to manipulate the characteristics of the variables under study. The data were obtained from the Central of Bank of Nigeria (CBN) statistical bulletin and National Bureau of Statistics (NBS) publications. The data were presented in Tables and analysed using descriptive statistics and inferential statistics using multiple regression (OLS) model of estimations of parameters. The data were tested for stationarity using the Augmented- Dickey-Fuller (ADF) tests; and for Normality using Jarque-Bera statistic.

The study proposed that:

Model one: WRCGDP = $f(CBD, INT)$

Thus,

WRCGDP = $\beta_o + \beta_1 CBD + \beta_2 INT + U_t$

Where:

WRCGDP represents Small Medium Enterprises development proxied by Wholesale and retail contribution to gross domestic product

CBD represents financial innovation proxied by Commercial Banks' Deposits

INT also represents financial innovation proxied by Interest rate

β_o = Constant co-efficient of the model

β_1, β_2 = Coefficient of explanatory variables

U_t = Stochastic terms in year t

Model two: WRCGDP = $f(CBLSME, INT)$

Thus,

WRCGDP = $\beta_o + \beta_1 CBLSME + \beta_2 INT + U_t$

Where:

WRCGDP represents Small Medium Enterprises development proxied by Wholesale and retail contribution to gross domestic product

CBLSME represents financial inclusion proxied by Commercial Banks Loans to Small and Medium Enterprises

INT also represents financial inclusion proxied by Interest rate

β_o = Constant co-efficient of the model

β_1, β_2 = Coefficient of explanatory variables

U_t = Stochastic terms in year t

III.   Data presentation and analysis

Data presentation:

The data utilized for this study extracted from CBN statistical bulletin are presented in Table 1. The descriptive statistics of the data processed in this work are shown in Table 2. And the Table 3 depicted extracts from the unit root test for stationarity at first difference.

Table 1: Input data of the study

YEARS	CBLSME (₦' M)	INT (%)	CBD (₦' M)	WRCGDP (₦' M)
2000	44542.3	17.98	4582127.3	78647.28
2001	52428.4	18.29	4725086	61837.98
2002	82368.8	24.85	6912381.3	115428.24
2003	90176.5	20.71	8487031.6	102435.78
2004	54981.2	19.18	11411066.9	13426775.98

2005	50672.6	17.95	14572239.1	16987445.76
2006	1946956.6	17.26	18564594.7	18765434.86
2007	5056720.91	16.94	20457251.1	23544322.54
2008	8059548.9	15.14	23842126.2	24564375.34
2009	10219336.11	18.98	22249689	1465354.74
2010	9830344.08	17.92	23045907.35	7654324.18
2011	14183591.82	16.78	23213654	5385815.1
2012	15151762.15	19.54	24098734	6284920.68
2013	16191470	14.56	25638963	1944073.87
2014	18115205.78	15.26	5482152.17	2152090.65
2015	18719263.04	15.06	7115604.46	18028895.28
2016	21982149.04	13.96	9451090.92	20675880.01
2017	10747.89	17.58	87616419.96	4316.710565
2018	44822.84	16.72	82135724.33	4505.110343
2019	123932.1	14.99	92117813.02	4734.860443

Source: CBN statistical bulletin

Table 2: Descriptive statistics of the data processed

	CBD	CBLSME	INT	WRCGDP
Mean	25785983	7000551.	17.48250	8062581.
Median	19510923	3501839.	17.42000	3768953.
Maximum	92117813	21982149	24.85000	24564375
Minimum	4582127.	10747.89	13.96000	4316.711
Std. Dev.	27549672	7847147.	2.515727	9086872.
Skewness	1.684145	0.552859	1.112968	0.643947
Kurtosis	4.337188	1.759378	4.760491	1.791437
Jarque-Bera	10.94454	2.301461	6.711762	2.599415
Probability	0.004202	0.316406	0.034879	0.272612
Sum	5.16E+08	1.40E+08	349.6500	1.61E+08
Sum Sq. Dev.	1.44E+16	1.17E+15	120.2488	1.57E+15
Observations	20	20	20	20

Source: E-view Version 8 output data

The descriptive statistics shown in tables 1 and 2 reveal the mean CBD of the deposit money banks in Nigeria over the period under review (2000 to 2019) was 25785983, to the highest value of 92117813 in 2019. The INT recorded lowest 13.96% and highest rate of 24.85% in 2002. The WRCGDP had lowest figure of 4316.711 in 2017, and highest figure of 24564375 in 2008. The CBLSME recorded lowest value of 10747.89 in 2017 and highest value of 21982149 in 2016. The Jarque - Bera statistic for CBD (10.94454; 0.004202) and INT (6.711762; 0.034879) indicated normal distribution. The CBLSME and WRCGDP indicated normality at above 20%. The models therefore, shall not be used for predictive purpose, but can give indication of contribution to the dependent variable: WRCGDP (proxy for SME development).

Table 3: Unit root tests (Augmented Dickey-Fuller test statistic)

Variables	R^2	Adj R^2	Prob (F-stat)	Durbin_Watson stat	t- Statistic	5% Critical Value	Level
CBLSME	0.5393	0.5105	0.00052	1.995	- 3.04	0.0038	1(1)
WRCGDP	0.5432	0.5147	0.00048	2.046	- 3.04	0.0036	1(1)
CBD	0.9276	0.9095	0.00000	1.627	- 3.06	0.0000	1(1)
INT	0.6879	0.6683	0.00002	1.812	- 3.12	0.0002	1(1)

Source: Extracts from the Unit root tests on the variables using e-view 8

The Augmented Dickey Fuller (ADF) Unit Root Test is used to test stationarity of the variables and 5% critical value is selected. All the variables were stationary at first level. The critical diagnostic statistics were significant and therefore, we can estimate the models and test the hypotheses.

Hypotheses testing

The two hypotheses formulated are: Financial innovation has no positive and significant contribution to the development of SMEs in Nigeria; and financial inclusion has no positive and significant contribution to the development of SMEs in Nigeria.

The decision rule: If the coefficient estimate of the independent variable has a positive sign and its probability value less than 0.05, the null hypothesis is rejected and alternate hypothesis accepted. On the other hand, if the coefficient estimate of the independent variable does not have a positive sign and its probability greater than 0.05, the null hypothesis is accepted and alternate rejected.

Hypothesis one:

H_01: Financial innovation (Commercial bank deposits, and interest rate) has no positive and significant contribution to the development of SMEs in Nigeria.

Ha1: Financial innovation has positive and significant contribution to the development of SMEs in Nigeria.

The regression out data on model one: $WRCGDP = \beta_o + \beta_1 CBD + \beta_2 INT + U_t$ are depicted in Table 4.

Table 4: Regression output data I (dependent variable: WRCGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBD	-0.136301	0.069362	-1.965078	0.0660
INT	-1633042.	759576.4	-2.149938	0.0462
C	40126889	13922221	2.882219	0.0103
R-squared	0.288587	Mean dependent var		8062581.
Adjusted R-squared	0.204892	S.D. dependent var		9086872.
S.E. of regression	8102660.	Akaike info criterion		34.79076
Sum squared resid	1.12E+15	Schwarz criterion		34.94012
Log likelihood	-344.9076	Hannan-Quinn criter.		34.81992
F-statistic	3.448055	Durbin-Watson stat		0.989591
Prob(F-statistic)	0.055339			

Source: E-view version 8 output data on hypothesis one

From Table 4, the R-squared of 0.288 and adjusted R-squared of 0.204 indicated that only 28.8% and adjusted 20.4% of the changes in development of SMEs in Nigeria were explained by financial innovations variables (CBD and INT). The F-statistic value of 3.448055 with a Prof (F-statistic) of 0.055339 (almost equal to the significance of 0.05) indicated that the model is significantly correct to explain relationship between the dependent and independent variables. The Durbin-Watson stat of 0.989591 which is below 2.0 indicated presence of autocorrelation, and therefore the model is not fit for predictive use but useful in describing the relationship between the dependent and independent variables. Table 5 showed summary statistics for testing hypothesis one.

Table 5: Summary statistics for testing Hypothesis one

Variables	Coefficient	Std. Error	t-Statistic	Prob.	Decision
CBD	-0.136301	0.069362	-1.965078	0.0660	Accept Ho
INT	-1633042.	759576.4	-2.149938	0.0462	Reject Ho

Source: Extracts from Table 4

The decision rule: If the coefficient estimate of the independent variable has a positive sign and its probability value less than 0.05, the null hypothesis is rejected and alternate hypothesis accepted. On the other hand, if the coefficient estimate of the independent variable does not have a positive sign and/ or its probability greater than 0.05, the null hypothesis is accepted and alternate rejected.

Decision: The coefficient estimates for CBD is -0.13630, and for INT is −1633042. Thus, the independent variables are inversely related to the dependent variable. The p-value statistic for CBD is 0.0660 >

0.05; for INT is 0.0462 < 0.05. However, the control variable INT had significant contributions to SMEs development in Nigeria. We therefore accept the Ho, and conclude that financial innovation had negative and no significant contributions to SMEs development in Nigeria. This means that financial innovations had not attracted significant deposits to banks, therefore, contributed insignificantly to development in SMEs in Nigeria during the period.

Test of Hypothesis Two:
H$_0$1: Financial inclusion (commercial banks loan to SMEs and interest rate) has no positive and significant contribution to the development of SMEs in Nigeria.
Ha1: Financial inclusion (commercial banks loan to SMEs and interest rate) has positive and significant contribution to the development of SMEs in Nigeria.
The regression out data on model two: $WRCGDP = \beta_o + \beta_1 CBLSME + \beta_2 INT + U_t$ are depicted in Table 6.

Table 6: Regression Output Data II (dependent variable: WRCGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBLSME	0.121056	0.303414	0.398981	0.6949
INT	-1095026.	946419.3	-1.157020	0.2633
C	26358919	17833451	1.478060	0.1577

R-squared	0.135089	Mean dependent var		8062581.
Adjusted R-squared	0.033335	S.D. dependent var		9086872.
S.E. of regression	8934132.	Akaike info criterion		34.98614
Sum squared resid	1.36E+15	Schwarz criterion		35.13550
Log likelihood	-346.8614	Hannan-Quinn criter.		35.01529
F-statistic	1.327605	Durbin-Watson stat		0.885014
Prob(F-statistic)	0.291243			

Source: E-view version 8 output data on hypothesis two

The Table 6 showed that financial inclusion (commercial banks loan to SMEs) had positive relationship with SMEs development (wholesale and retail contributions to GDP) in Nigeria during the period (the coefficient = 0.121056, p-value = 0.6949). This result means that financial exclusion characterized the development in SMEs in Nigeria during 2000-2019. The R-squared value of 0.135 (i.e. indicator of the goodness of fit of the model) showed that only 13.5% of variation in WRCGDP was explained by the regressors and about 86.5% of the relationship is explained by factors not captured by the model. The adjusted R – squared of about 0.033335 (3.3%) takes account of more number of regressors if included, and it will still explain 3.3% variation in the dependent variable. The F-statistic of 1.327605, and Prob (F-statistic) of 0.291243 at 5% level of significant indicates the overall regression is not significant. The summary statistics for testing hypothesis two are depicted in Table 7.

Table 7: Summary statistics for testing Hypothesis two

Variables	Coefficient	Std. Error	t-Statistic	Prob.	Decision
CBLSME	0.121056	0.303414	0.398981	0.6949	Accept Ho
INT	-1095026.	946419.3	-1.157020	0.2633	Accept Ho

Source: Extracts from Table 6

Decision: Since the coefficient estimate of the commercial banks loan to SMEs had a positive sign (0.121056), the probability value of 0.6949 is greater than 0.05, we therefore would not reject the Ho, but conclude that commercial banks loan to SMEs had positive and no significant contributions to SMEs development in Nigeria in 2010-2019. The coefficient estimate of INT was -1095026, the p-value was 0.2633 > 0.05. Thus, we have no reason to reject the null hypothesis. We conclude that financial inclusion has positive and no significant relationship with the development of SMEs in Nigeria.

IV. Discussion

The conclusion of hypothesis one agrees with the conclusion of Pierrakis and Collins (2013) who showed that technological advances have assisted the growth of crowd funding. The authors further argued the fact that the technology advances is the capability to effortlessly build a free online connection structure, secure

online money transferring services, accurate credit scores that can be utilized by many different financiers, and free social media marketing tools that can be utilized to engage geographically dispersed large crowds of people. It is not in doubt that technological products such as Global System for Mobile Communication (GSM), internet and mobile payments have improved the delivery of financial services significantly in developing SMEs in Nigeria. But, it is worrisome that the cost of access to the financial services are rather increasing the cost of doing business. Every person somehow casts the reason to insecurity and overreliance on importation, in spite the local content policy of the government. Moreso, the SMEs are known to fall short of such requirements like guarantors, collateral security, and business profile that will make for prompt access to credits. Ayyagari *et al.*, (2016) assert that SMEs are constrained financially and find it hard to access to credit compared to large firms.

Pallavi and Bharti, (2013) also identified financial inclusion as one of the solution to the development of Micro, Small and Medium Enterprises (MSMEs) globally. Khan (2011) contended that promoting financial inclusion, in the wider context of economic inclusion, can improve financial conditions and uplift the living standard of the poor and the disadvantaged. According to him, financial inclusion can both improve the efficiency of intermediation between savings and investments and facilitate change in the financial system configuration.

This study however discovered positive relationship between the financial inclusion and SMEs development in Nigeria, but the effect was not significant. This may be attributed to seeming low adoption to technology by the users, suspected hidden costs, and emphasis of microfinance funding of SMEs.

V. Conclusion

The various empirical studies reviewed show mixed results and conclusions. In some studies, strong positive relationships are found to exist between financial innovation, inclusion and SMEs development and in some the relationship is a bit weak. Other researchers report different results. This mixture of findings and conclusions emanates from differences in methodology, variables used and the period of study. Nevertheless, most studies show evidence to support the notion that there is a relationship between financial innovation, inclusion and SMEs development both short-term and long-term perspectives.

This study concludes that the various financial innovations are indeed positively contributing to development of SMEs in Nigeria. If commercial banks continued to develop products tailored for SMEs, then SMEs will embrace such products so as to access finances which are very critical in their growth and sustainability. The financial innovations that the banks were using in bid to grow and develop SME enterprises included small-scale business loans, small-scale business accounts, mobile banking, e-banking, agency banking and direct marketing.

The financial inclusion strategies employed by banks could have been limited by proximity to the SMEs, systemic risks such as corruption and insecurity associated to doing business in Nigeria, and infrastructural deficiency.

VI. Recommendations

The study recommends as follows:

1. MSMEs can only afford low loan amounts, this profoundly limits their ability to expand and diversify their investments in a way that would guarantee both continued growth and innovation. The government therefore, through the banks and Central Bank of Nigeria should package integrated value chain loan facilities for the MSMEs in order to enhance the innovativeness and development of MSMEs in Nigeria.
2. The digitizing of payments across the country should be prioritized, including improved ICT/E-banking tools such network access even in rural areas, promotion of Fintech startups as well as a consumer complaints/protection framework, to bolster confidence and increase financial inclusion in Nigeria. Continuous user's education and sustenance of agency banking policy will ease adoption process of the financial technology even among the MSMEs.

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