



## IMPACT OF FINANCIAL INCLUSION ON INVESTMENT IN NIGERIA

GIWA, Agbolade Babatunde<sup>1</sup> and ADENUGA, Abiodun Idris<sup>2</sup>

1. Department of Economics, Federal College of Education (Special), Oyo.  
EMAIL: [giwaagboladebabatunde@gmail.com](mailto:giwaagboladebabatunde@gmail.com)
2. Department of Economics, Lagos State University, Ojo, Lagos  
EMAIL: [iaadenuga@yahoo.com](mailto:iaadenuga@yahoo.com)

### Abstract

*The phenomenon of financial inclusion has been a subject of great concern especially in developing countries where many people, most especially the rural populace, the poor, the illiterate have been financially excluded from the formal financial services. Thus, this study examined the impact of financial inclusion on investment in Nigeria between the period of 1997Q1 to 2019Q4 using Fully Modified Least Squares (FMOLS). In this study, Gross Capital Formation (GCF) as a proxy for investment, was regressed against three measures of financial inclusion; deposits of rural branches of deposit money banks (DRBDMBS) (accessibility measure), loans of rural branches of deposit money banks (LRBDMBS) (affordability measure) and number of branches of deposit money banks in Nigeria (NBDMBS) (availability measure) as well as inflation and interest rates as control variables. Findings from the study indicated the existence of a long-run relationship between financial inclusion and investment in Nigeria. Furthermore, the FMOLS revealed that deposits of rural deposit money banks had significant positive impact on gross capital formation in Nigeria. However, the number of branches of deposit money banks in Nigeria and loans of rural deposit money banks do not exert significant influence on investment in Nigeria. It can therefore be concluded that financial access, promotes the level of investment in Nigeria. The study recommends that more rural branches be opened by deposit money banks in Nigeria and incentives to do this should be provided by the government.*

**Key words:** Deposit Money Banks, Financial Inclusion, Gross Capital Formation, Investment.

### 1.0 Introduction

Financial inclusion has been at the center of development strategies of most developing countries Nigeria inclusive bearing in mind its importance in accelerating economic growth and development. Therefore, Nigeria has put in place different financial policies aimed at stimulating the financial services industry in order to meaningfully contribute its quota to real sector growth and overall development of the country. As a matter of fact, Nigeria is fully committed to the 2011 Maya Declaration in Mexico with the aim of pursuing a financial inclusion strategy that would reduce the adult financial exclusion rate from 46.3 per cent in 2010 to 20 per cent by 2020 (Central Bank of Nigeria [CBN], 2015). Furthermore, CBN (2015) notes that Nigeria launched her National Financial Inclusion Strategy (NFIS) on 23rd October, 2012 with specific targets for products, including payments, savings, credit, insurance, and pensions, as well as channels, such as deposit money bank branches, microfinance bank branches, Automated Teller Machines (ATMs), Point of Sales (POS) devices, and agents.

Babajide et al (2015) succinctly analysed the importance of Financial inclusion in an economy as an improvement in quantity, quality, and efficiency of financial intermediary services, which generates local savings, with the resultant improvement in local business productive abilities. Through financial inclusion, there is provision of access to and usage of diverse, convenient, affordable financial services (Uruakpa et al., 2019). Justifying further the role of financial



inclusion Odeleye and Olusoji (2018) stress the fact that it helps to tackle poverty, improve welfare and general standard of living; with consequential promotion of economic growth.

Investment remains a bedrock for capital formation which eventually translates into real sector's growth and development (Ugochukwu & Uruakpa, 2013; Shuaib & Ndidi, 2015; Babarinde et al, 2020). Although, investment is part and parcel of economic growth but it is only when individuals have access to credits in the economy that they can make investments that can contribute to economic growth (Omojolaibi & Popogbe, 2018). The finance-led growth hypothesis emphasizes the positive role of financial system development in economic growth of the country. And since financial inclusion is an integral part of financial development, financial inclusion spurs economic growth. Capital formation (investment) is one the key determinants of economic growth of a nation (Ugochukwu, & Uruakpa, 2013; Shuaib & Ndidi, 2015; Emeka et al, 2017). Kama and Adigun (2013) posit that access to financial services, that are well suited for low-income earners promote enormous capital accumulation, credit creation and investment boom. Thus, these implies that one of the vehicles through which financial inclusion could achieve economic growth is investment.

The extent to which financial inclusion influences this investment, as a conduit-pipe for economic growth, is a subject of debate among researchers. Although, empirical studies abound on the nexus between financial inclusion and economic growth (Babajide et al, 2015; Nwafor & Yomi 2018; Omojolaibi & Popogbe, 2018; Odeleye & Olusoji, 2018; Onaolapo, 2015; Okoye et al, 2017; Uruakpa et al, 2019; Wakdok, 2018)) but relatively, few studies have focused on investment and financial inclusion nexus in a developing country like Nigeria (Omojabi and Popoye 2018). The degree to which financial inclusion promote or deter the level of investment in an economy has not been adequately and empirically investigated by researchers in developing countries like Nigeria. Hence, the motivation for this current study.

Therefore, the main aim of this empirical study is to determine the impact of financial inclusion on the level of investment in Nigeria. The specific objectives are:

- i. To assess the impact of deposits from rural branches of deposit money banks on gross capital formation in Nigeria;
- ii. To examine the impact of loans to rural branches of deposit money banks on gross capital formation in Nigeria.
- iii. To determine the impact of number of branches of deposit money banks in Nigeria on gross capital formation in Nigeria.

Therefore, the study was hypothesized as follows:

H<sub>01</sub>: Deposits of rural branches of deposit money banks do not exert significant influence on gross capital formation in Nigeria;

H<sub>02</sub>: Loans of rural branches of deposit money banks do not have significant impact on gross capital formation in Nigeria;

H<sub>03</sub>: Number of branches of deposit money banks does have significant impact of on gross capital formation in Nigeria.

This study analyzed the impact of financial inclusion on investment in Nigeria covering period stretching from 1997Q1 to 2019Q4. The study period chosen is a result of data availability. Quarterly data were computed from the annual version available to ensure data sufficiency for the purpose of data analysis. Unlike most previous studies which employed autoregressive Distributed Lag, Ordinary Least squares techniques, this current study employs the recently proposed Phillips and Hansen (1990)'s Fully Modified Least Squares (FMOLS).



The remaining part of the paper is structured as follows: Section two presents the review of relevant literature on financial inclusion and investment. Section three describes the data and methodology used in the study and Section four reports and discusses the empirical findings from data analysis. Conclusion and policy recommendations constitute the subject matters of Section five.

## **2.0 Literature Review**

The review of literature covers conceptual review, theoretical review and empirical review.

### **2.1 Conceptual Review**

Investment is the commitment of current capital resources in a project, business, venture, outlets in anticipation of future capital gain, current income and other returns therefrom. In the work of Adetiloye and Adeyemo (2012), real domestic investment has been described as expenditure incurred to increase the total capital stock in the economy which could be achieved by acquiring further capital-producing assets and assets that can produce or generate income within the domestic economy. It is important to note that the bedrock of investment is capital formation. Hence, capital formation as defined by Onaeze (2016) is the net additions to the (physical) capital stock in an accounting period, or to the value of the amount of increase of the capital stock. Capital formation is defined as the process of stocking valuable assets, the increase in wealth or creation of additional wealth (Adetiloye & Adeyemo, 2012). Explaining capital formation further, Babarinde et al (2020), described it as an addition to stock of capital assets and resources geared towards further production of goods in real sector with the ultimate aim of boosting physical capital assets in an economy. The authors also define gross capital formation as the totality of capital stock of a nation existing at a particular point in time.

Conceptually, attempts have been made by several scholars to explain the meaning of financial inclusion. For instance, financial inclusion has been described as a state where various financial services are delivered by a variety of providers, to reach everyone who could use them (Kama & Adigun, 2013). In other words, provision of a varieties of financial products and services to as many that are willing and capable of using the services in an economy, implies financial inclusion. Sarma (2008, 2010, 2012) and Onaolapo (2015) define financial inclusion as a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy. This implies three dimensions of accessibility, availability and affordability of financial services must be presented before we could say there is an inclusive financial system. In other words, financial inclusion is a process that marks improvement in quantity, quality, and efficiency of financial intermediary services (Babajide et al, 2015). Babajide et al's definition emphasizes quality and quantity of financial service as well as the efficiency of process of financial intermediation as hallmark of financial inclusion. EFINA (2019) conceptualises financial inclusion as 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 segment. Just like Babajide et al, EFINA (2019) also emphasizes quantity and quality of financial services but still adds the element of relevance, appropriateness(suitability) and affordability as other dimensions of financial inclusion. Furthermore, according to Ibor et al. (2017), financial inclusion is the ability of some individual to access and use basic financial services delivered in a reasonably convenient, reliable and flexible manner. Ogbeide and Igbinigie (2019) view financial inclusion as the provision of contact to and usage of a range of quality, convenient financial services at affordable prices, delivered by a range of providers in a stable, competitive market to financially capable clients. Moreover, Wakdok (2018) sees financial inclusion as a process that assures the ease of access, availability and usage of the formal financial system by all members of an economy. Similarly, Uruakpa et al (2019) define



financial inclusion is multidimensional, encompassing access to use of and capability in relation to a range of financial services.

According to Sarma (2010), the most commonly used indicator has been the number of bank accounts (per 1000 adult persons). Some other indicators are number of bank branches (per million people), number of ATMs (per million people), amount of bank credit and amount of bank deposit. Sarma (2010)'s index of financial inclusion considers three basic dimensions of an inclusive financial system, namely, banking penetration, availability of the banking services and usage of the banking system.

From the review above, financial inclusion can therefore be referred to as the ability of individuals to access, and or effectively use, high quality and varieties of financial products and services which can help them to engage meaningfully social activities worthy of good living. As such, most definitions of financial inclusion emphasize three basic dimensions, namely, access to financial services; usage of financial services; and quality of the products and the service delivered. Although the issue of financial inclusion is multidimensional, but basically it can be said that it revolves round four main issues/entities, namely, the financial product and services, the financial services providers, the consumers of the services and the entire financial system. The financial products and services, in terms of quality and quantity made available to consumers; the financial intermediaries in terms of the convenience, reliability and flexibility of operations, affordability of prices charged, varieties of providers (non-monopolistic), fairness and competitiveness among them, etc; the consumers in terms of their willingness, capacity to enjoy the financial services; and the entire financial system in terms of width, depth, resilience (stability) and growth of the system to ensure adequacy and variety of financial services are made available in the economy on a sustainable basis.

## 2.2 Theoretical Review

Theoretically, the role of financial development in economic growth and vice versa was established in Patrick (1966)'s twin hypotheses- Demand-Following and Supply-Leading hypotheses. The Supply-Leading hypothesis emphasizes the role of financial development such as financial deepening, financial inclusion in promoting the growth of the economy. Through savings and investment, which enhance capital formation, transformation of non-productive capital resources to productive ones, financial markets are able to lead (cause) real sector growth. In a related hypothesis, the financial intermediation theory/postulate also reiterates the fact that through the linkage of the surplus and deficits economic units, investible capital is formed from savings accumulated which are eventually translated into the real sector for investment purposes.

Conversely, the Demand-Following hypothesis of Patrick, states rather than financial developing Granger-causing economic growth, it is the other way round. This means according to the Demand-Following hypothesis by Babarinde (2020b), it is economic growth that stimulates demand for financial products and services, thereby Granger-causing financial sector development. In another theory, the accelerator effect theory, according to Dutta and Roy (2009), states that a boost in investment occurs through the channel of Gross Domestic Product (GDP), such that a rise in GDP, causes firms to increase their investment and consequently their profit margins rise too. The authors explain further that implication of this will lead to expansion in firms' fixed investment, in terms of increased capital stock and ultimately and furthermore economic growth is stimulated by raising consumer expenditure (via the multiplier effect). It is seen from the Accelerator effect theory that the theory tends to view economic growth as Granger-causing investment expansion in an economy.





### **2.3 Empirical Review**

Specifically, financial inclusion, an aspect of financial development has also been linked empirically to influencing significantly economic growth of countries (Babajide et al, 2015; Onaolapo, 2015; Okoye et al, 2017; Nwafor & Yomi 2018; Omojolaibi & Popogbe, 2018; Odeleye & Olusoji, 2018; Wakdok, 2018); Uruakpa et al, 2019). However, there cannot be economic growth without capital formation in the form of investment. In the light of this, Abdulmumin et al (2019) argue that financial inclusion is important for economic growth through redistribution of economic resources. One of these resources is the capital resources in the form of investment capital of a nation. Therefore, investment could be regarded as a conduit pipe through which the growth of an economy is attained.

Historically, in Nigeria, the formal policy attempt at ensuring financial inclusion could be traced to the 1977 rural banking programme/policy of the government. Other initiatives include the establishment of People's Bank of Nigeria 1989, Community Banks in 1990 and microfinance banks in 2005, Non- Interest Financial Institutions (NIFIs) in 2011 (Kama & Adigun, 2013). These programmes were meant to serve the poor, to encourage banking habits by the people, to expand the access and availability and usage of financial services by the generality of the populace most especially that fall outside the bracket of formal sophisticated structure of the Nigerian financial system. Furthermore, Kama and Adigun (2013) opine that these institutions constitute the major vehicle for financial inclusion of those excluded from the formal financial architecture of Nigeria. Although, the genesis of financial inclusion is ownership and operation of an account with banks and financial services providers. However, statistics (Demirgüç-Kunt et al., 2018) shows that 69 per cent of the adults in the world have an account and globally, about 1.7 billion adults remain unbanked. According to the Global Findex survey which began in 2011, the share of adults in the world with an account rose from 51 percent in 2011 to 62 percent in 2014 and then to 69 percent in 2017. The Index puts adult with an account in Nigeria in 2017 to be 40% (Demirgüç-Kunt et al., 2018). According to Access to Financial Services in Nigeria Survey [EFInA] (2018) as cited in National Financial Inclusion Implementation Strategy (NFIS) (2019), 63.2 per cent of Nigerians are financially served while 36.8 per cent are financially excluded which implies that there remains significant room for scaling up the implementation drive and accordingly Nigeria aims to have a financial inclusion rate of 95% by 2024.

Empirically, most studies focused on financial inclusion-growth nexus while few linked financial inclusion with investment. Among these few is Dutta and Roy (2009) who analyzed the role of financial development in boosting domestic investment of a country. From the analysis, the authors posit that the responsiveness of investment to developments in the financial sector is conditional on the investment climate already in place in the country. Omojolaibi and Popogbe (2018) examine the relationship between financial inclusion and investment in Nigeria. The study shows that credit to private sector has positive and significant long run relationship with gross capital formation. Further empirical findings from the study indicate that, unlike deposits with deposit money banks show a negative but non-significant relationship with gross capital formation, concentration of deposit money banks exerts a positive relationship with gross capital formation in Nigeria. In another study, Emeka et al. (2017) evaluate the link among domestic investment, capital formation and economic growth in Nigeria and establish that domestic investment and gross fixed capital formation granger-cause economic growth in Nigeria.

Sakyi et al. (2016) investigate the impact of financial development on private investment in Ghana. The results suggest that financial development has not been a key driver of private



investment in the long run, while, in the short run, the effect of financial development on private investment depends on how financial development is measured.

In the examination of the relationship between financial development and investment in Turkey by Demirhan (2016), the author's findings suggest a unidirectional causality flows from stock market development to investment in addition to an evidence of a unidirectional causality from investment amount to banking sector development in Turkey. Muyambiri and Odhiambo (2017) examine the impact of both bank-based and market-based financial development on investment in Botswana. The study shows that while bank-based financial development has both a long-run and short-run positive impact on investment in Botswana but market-based financial development has no significant impact on investment in the country, either in the short run or in the long run. Muyambiri and Odhiambo (2018) review the empirical literature on the impact of financial development on investment and conclude that financial development has, empirically, a rather significant impact on investment. Ndako (2017) evaluates the relationship among financial development, investment and economic growth in Nigeria. The study establishes investment as a critical channel that influences economic growth through financial development. Furthermore, Iheonu et al. (2020) investigate the impact of financial sector development on domestic investment in selected countries of the Economic Community of West African States (ECOWAS). The study's results show that domestic credit to the private sector has a positive but insignificant impact on domestic investment in ECOWAS, whereas banking intermediation efficiency and broad money supply negatively and significant influence domestic investment; cross-country differences exist in the impact of financial sector development on domestic investment in the selected ECOWAS countries; and domestic credit to the private sector Granger causes domestic investment in ECOWAS.

In their investigation of the relationship between financial inclusion and economic growth in Nigeria, Odeleye and Olusoji (2018) argue that money supply, liquidity ratio and credit to the private sector appear to be the major drivers of economic growth in Nigeria, however; demand deposit represses growth in Nigeria. In the same vein, Onaolapo (2015) submits that inclusive bank financial activities greatly influenced poverty reduction but marginally determined national economic growth in Nigeria. Similarly, findings of Babajide et al (2015) show that financial inclusion is a significant determinant of the total factor of production, as well as capital per worker, which invariably determines the final level of output in the Nigerian economy. Furthermore, from their investigation of the effect of financial inclusion on economic growth in Nigeria, Okoye et al (2017) shows among that financial inclusion has promoted poverty alleviation in Nigeria through rural credit delivery. Nwafor and Yomi (2018) also reveal that financial inclusion has significant impact on economic growth in Nigeria. Similarly, Wakdok (2018) concludes that financial inclusion has a positive and significant impact on economic growth in Nigeria through financial deepening variables which are influenced by financial inclusion variable such as broad money, credit to private sector, loan deposit of the rural area and liquidity ratio of deposit money banks.

Likewise, Ogbeide and Igbinigie (2019) examine the impact of financial inclusion on poverty alleviation in Nigeria. The study found financial inclusion to exert significant impact on per capita income, reduces poverty level and improves standard of living. Moreover, Uruakpa et al. (2019) also show that deposits of rural branches of deposit money banks and ATM transactions exert a positive and significant impact on economic growth in Nigeria while loans of rural branches of deposit money banks exert a negative and insignificant impact on economic growth of Nigeria.

From the empirical review above, it is clear that financial inclusion has been operationalized using different indicators such as credit to private sector, loans of rural branches of deposit

money banks, deposits of rural branches of deposit money banks, deposit money bank branches per 100, 000 adults, number of ATMs per 1000 per people. Some studies classified these indicators along sub-themes such as accessibility, affordability, and availability. The differences in measures of financial inclusion also breed differences in findings on the empirical link between financial inclusion and investment. Most studies reviewed also establish a positive impact of financial inclusion on economic growth.

### 3.0 Methodology

This study is based on ex-post facto design, which entails the establishment of relationship between variables of interest using historical data. Hence, secondary data on quarterly basis computed from the available annual time series from the Central Bank of Nigeria (2019)'s statistical bulletin and World Development Indicators (2019). The study period was 1997Q1 to 2019Q4, making a total of 92 data sets. In model specification, this study adapts the model of Omojolaibi and Popogbe (2018) which specified investment as measured by gross capital formation as a function of three dimensions of financial inclusion, namely, affordability, accessibility, and availability and their respective proxies as credit to private sector, deposits with commercial (deposit money) banks and commercial banks' branches concentration.

### 3.1 Model Specification

The model for the study is designed as;

$$GCF = f(DRBDMB, NBDMBS, LCRBDMB, INF, INT) \quad (1)$$

Representing the implicit model in equation 1 in its implicit form we have

$$GCF = \alpha_0 + \alpha_1 DRBDMB + \alpha_2 NBDMBS + \alpha_3 LCRBDMB + \alpha_4 INF + \alpha_5 INT + \mu \quad (2)$$

Where:

GCF: Gross Capital Formation which is the dependent variable

DRBDMB: Deposit of Rural branches of deposit money banks (measure of accessibility)

NBDMBS: Number of branches of deposit money banks in Nigeria (Measure of availability)

LCRBDMB: Loan to customers of rural branches of deposit money banks  
(measure of affordability)

INFR: Inflation rate (Measure of Macroeconomic stability)

INT: Interest rate (Price of investment).

### 3.2 Apriori Expectaion

The apriori expectation revealed a positive expectation of the coefficients of the variables coefficients as follow

It is expected that each measure of financial inclusion in the study's model should have significant positive impact on gross capital formation in Nigeria. Hence, the following are expected to stand:  $\alpha_0 > 0$ ,  $\alpha_1 > 0$ ,  $\alpha_2 > 0$ ,  $\alpha_3 > 0$ ,  $\alpha_4 > 0$ ,  $\alpha_5 > 0$ ,

### 3.3 Sources and Measurement of Variables

The sources and description of the variables are presented in Table 1 below.

Table 1: Description of Variables

Variables	Description	Measurement	Source`
GCF	Gross capital formation,(as dependent variable)	Gross capital formation is measured as gross capital formation at current local currency unit.	WDI
Financial Inclusion			
DRBDMB	Deposits from rural branches of deposit money bank.	Deposits from rural branches of deposit money banks, expressed in Billion Naira.	CBN Statistical Bulletin
LCRBDMB	Loans to rural branches of deposit money banks.	Loans to rural branches of deposit money banks expressed in Billion Naira.	CBN Statistical Bulletin
NBDMB	Number of branches of deposit money banks in Nigeria.	Number of deposit money bank branches per 1000km <sup>2</sup> ,	CBN Statistical Bulletin
INTR.	Interest rate	Interest paid by banks on savings and deposit, expressed in percentage.	CBN Statistical Bulletin.
INFR	Inflation rate.	Inflation, consumer price indices (annual %),	WDI

Source: Researcher's Compilation.

### 3.4 Estimation Technique

In analyzing the data, a battery of econometric tools such as unit root test, cointegration test, pairwise granger causality test, Fully Modified Ordinary Least Squares, and Canonical cointegrating regression were applied to the quarterly time series data. The data analysis begins with the statistical description of the variables of study via descriptive statistical test, after which the augmented Dickey-Fuller (ADF) test was conducted to determine the stationarity or otherwise of each variable as well as ascertain the level of integration of the variables. Evidence of the I(1) nature of the series prompted the application of the Johansen cointegration test to determine the long-run relationship among the variables of study. Since if individually each variable is not stationary, then a linear combination of the variables should produce stationarity, hence, the result of the cointegration test showing evidence of cointegration led to the estimation of the long-run estimates of the impact of financial inclusion on investment in Nigeria using the Fully Modified Ordinary Least Squares (FMOLS) estimation technique.

## 4. Data Analysis and Results

### 4.1 Descriptive Statistics

The results of the descriptive statistical test of the variables of study, namely, gross capital formation (GCF), loans of rural branches of deposit money banks (LRBDMBS), deposit of rural branches of deposit money banks (DRBDMBS), number of branches of deposit money banks (NBDMBS), inflation rate (INFR) and saving interest rate (INTR) are presented in Table 2.

From the table, the average GCF over the study period (1997Q1-2019Q4) stands at N312billion compared with its standard deviation of N342billion. This suggests a relative instability (high



variability) of the variable from its mean value. In the same vein, their respective standard deviation higher than their mean values, LRBDMBS, and DRBDMBS are also relatively volatile in the period of investigation.

**Table 2: Descriptive Statistics**

	GCF	LRBDMBS	DRBDMBS	NBDMBS	INFR	INTR
Mean	3.12E+11	1652.013	2935.605	517.0326	6.0029	2.5097
Median	1.40E+11	1182.700	2201.775	545.0000	3.5079	2.3750
Maximum	1.23E+12	8529.625	16122.50	871.7500	18.2088	4.7000
Minimum	2.18E+10	8.9750	27.9250	246.0000	1.4292	1.0275
Std. Dev.	3.42E+11	1857.873	3387.480	160.2511	5.1061	1.1769
Skewness	1.1662	2.0965	2.4674	0.2703	1.0444	0.2302
Kurtosis	3.4436	8.5826	10.3858	2.7029	2.6294	1.6528
Jarque-Bera	21.6110	186.8633	302.4637	1.4586	17.2537	7.7694
Probability	0.0000	0.0000	0.0000	0.4822	0.0001	0.0205
Observations	92	92	92	92	92	92
Measurement	Billion Naira	Billion Naira	Billion Naira	Count	Per cent	Percent

Source: Researcher's computation using Eviews Version 10

However, NBDMBS, INFR and INTR having their mean value exceeding their respective standard deviation; can be inferred not to be widely dispersed from their average values. Based on the Jarque-Bera statistics, all the variables except NBDMBS and INTR, failed the normality test. All the variables are positively skewed and with kurtosis above 3, GCF, LRBDMBS and DRBDMBS could be described to be leptokurtic while other variables with less 3 kurtosis value (NBDMBS, INTR and INFR) are platykurtic in nature.

#### 4.2. Unit Root Tests

To avoid time-variant results and spurious regression occasioned with regression of non-stationary variables, this study conducts the augmented Dickey-Fuller (ADF) unit root test on each variable expressed logarithmically and the results as summarized in Table 3

**Table 3: Augmented Dickey-Fuller Unit Root Tests**

Variables	ADF at level		ADF at first diff		Integration
	Intercept	Remarks	Intercept	Remarks	Order
<i>ln</i> GCF	-0.1308	[0.9419]	-2.6343	[0.0900] ***	I(1)
<i>ln</i> LRBDMBS	-1.9370	[0.3141]	-7.9521	[0.0000] *	I(1)
<i>ln</i> DRBDMBS	-1.5306	[0.5137]	-9.7912	[0.0000] *	
<i>ln</i> NBDMBS	-0.9742	[0.7594]	-3.4667	[0.0112] **	
<i>ln</i> INFR	-2.5038	[0.1179]	-9.3840	[0.0000] *	I(1)
<i>ln</i> INTRS	-0.6386	[0.8556]	-9.4085	[0.0000] *	I(1)

Source: Researcher's computation      The prefix *ln* denotes natural logarithm.

Note: \*, \*\* and \*\*\* stationary at 1%, 5% and 10% respectively.

Table 3 revealed that none of the variables is stationary at level but at first difference I(1). The results of the ADF at first difference in Table 3 reveal that gross capital formation (GCF) attains stationarity at first difference at 10 per cent level of significance, while loans of rural branches of deposit money banks (LRBDMBS), deposits of rural branches of deposit money banks (DRBDMBS), inflation rate (INFR) and interest rate on savings by deposit money banks (INTR) attains stationarity at 1 per cent level after first difference. In the same vein, the hypothesis of unit root in the number of branches of deposit money banks (NBDMBS) is rejected at 5 per cent, at the first difference form of the variables. In sum, the ADF unit root test results reveal that the variables contain unit root(non-stationary) in their level form but when all the variables of study are expressed in the first differences, they all became stationary. The variables can be said to be I(1) series, that is, they are integrated of the order one(1), since they all attain stationarity only after first difference.

### 4.3 Cointegration Test

Since all the variables are integrated at first order I(1) there is a need to test for any evidence of long-run co-movement among the variables of study. The study therefore applies the Johansen cointegration test whose results is reported in Table 4.

**Table 4: Johansen Cointegration Test**

Hypothesized		Trace Test		Maximum Eigenvalue Test	
No. of CE(s)	Eigenvalue	Trace Statistic	Prob.	Max-Eigen Statistic	Prob.
None	0.3762	115.4424	0.0011*	42.01242	0.0299*
At most 1	0.2954	73.4300	0.0250*	31.16434	0.1019
At most 2	0.2164	42.2656	0.1514	21.70828	0.2357
At most 3	0.1295	20.5574	0.3858	12.34764	0.5137
At most 4	0.0840	8.2097	0.4432	7.815872	0.3977
At most 5	0.0044	0.3938	0.5303	0.393885	0.5303

Source: Researcher's computation using Eviews Version 10

Note: \*Rejection of null hypothesis of no cointegration

From Table 4, we found reported Trace test which indicates 2 cointegrating equations while Max-eigenvalue test indicates 1 cointegrating equations both at the 0.05 level. These implies that there is an evidence of a long-run relationship between financial inclusion and investment in Nigeria in the study period.

### 4.4 Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) Models Estimation

The cointegrating (long-run) effect of financial inclusion on investment in Nigeria was empirically established using the Fully Modified Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) techniques.

**Table 5: Fully Modified Least Squares (FMOLS)**

Dependent Variable: <i>In</i> GCF			
Method: Fully Modified Least Squares (FMOLS)			
Variable	Coefficient	t-Statistic	Prob.
<i>In</i> DRBDMB	0.5086	1.6942	0.0939***
<i>In</i> NBDMBS	0.3347	0.5896	0.5570
<i>In</i> LRBDMBS	-0.0411	-0.1802	0.8574
<i>In</i> INFR	0.3640	3.8246	0.0002*
<i>In</i> INTR	-1.5208	-10.5054	0.0000*
Constant	21.0158	7.5755	0.0000*
R-squared ( $R^2$ )	0.9471		
Adjusted $R^2$	0.9440		

Source: Researcher's computation                      The prefix '*In*' denotes natural logarithm.

Note: \*\*\*, \*\* and \* implies statistically significant at 10%, 5% and 1% respectively.

The results of the models as shown in Table 5 reveal that the joint explanatory variables explain change in capital formation by 94.71 percent as revealed in the R- Squared ( $R^2$ ) of 0.9471. The Adjusted  $R^2$  of 0.9440 also shows that the model is well specified. Further analysis of the FMOLS reveals that deposit of rural deposit money banks (DRBDMBS) has positive effect on gross capital formation (GCF) in Nigeria and the relationship is significant at 10 per cent level. This means that access to financial services spur the level of investment in Nigeria. Similarly, the number of branches of deposit money banks in Nigeria (NBDMBS) is positively signed with gross capital formation but is not statistically significant. This means that the number of branches of deposit money banks in Nigeria has only a suggestive but not significant effect on the level of investment in the country. Unlike, the number of branches of deposit money banks in Nigeria, loans of rural branches of deposit money banks (LRBDMBS) has negative but still non-significant effect on gross capital formation in Nigeria. In other words, loans of rural deposit money banks (LRBDMBS) though negatively signed, does not exert significant influence on investment in Nigeria. Furthermore, the result regression estimates further reveals that inflation and interest rate significant positive and significant negative effects respectively on gross capital formation in Nigeria.

In summary, the regression analysis indicates deposits of rural branches of deposit money banks, an accessibility measure of financial inclusion, and inflation rate have positive significant impact on investment (measured as gross capital formation) in Nigeria. However, interest rate exerts negative but significant impact on gross capital formation in the country. Other indicators of financial inclusion, number of branches of deposit money banks, and loans of rural branches of deposit money banks do not constitute significant determinants of the level of investment in Nigeria in the study period.

### 5.0 Conclusion and Policy Recommendations

This study analysed the impact of affordability, accessibility and availability indicators of financial inclusion on the level of investment as measured by gross capital formation in Nigeria between the period of 1997Q1 to 2019Q4 using Fully Modified Least Squares (FMOLS). Gross



capital formation as a proxy for investment, was regressed against three measures of financial inclusion, deposits of rural branches of deposit money banks (accessibility measure), loans of rural branches of deposit money banks (affordability measure), number of branches of deposit money banks in Nigeria (availability measure), and inflation rate and interest rate as control variables. Empirical findings show the existence of a long-run relationship between financial inclusion and investment in Nigeria. Furthermore, the FMOLS reveal that deposits of rural deposit money banks and inflation rates have significant positive impact on gross capital formation in Nigeria. However, interest rate exerts significant negative impact on gross capital formation in the country. Other indicators of financial inclusion, number of branches of deposit money banks, and loans of rural branches of deposit money banks do not constitute significant determinants of the level of investment in Nigeria in the study period.

It can therefore be concluded that financial access promotes the level of capital formation (investment) in Nigeria. This suggests that the more people have access to financial services via financial inclusion, in the forms of savings deposits, the more the expansion in the capital base of the economy and the higher the tendency of the translation of the capital formed to capital asset acquisition and by extension the higher the level of investment in the economy. The study recommends that more rural branches be opened by deposit money banks in Nigeria and incentives to do this like infrastructural development, tax holidays for rural branches of financial institutions in Nigeria, etc, should be provided by the government. Government regulatory agencies like the Central Bank of Nigeria should keep an eagle eye on investment environmental variable such as interest and also monitor inflation rate to ensure they are investment-friendly.

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