

## Financial Inclusion and Macroeconomic Stability As a Panacea for Poverty Reduction in Nigeria: An Empirical Analysis

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**Abstract:** *The study evaluated the impact of financial inclusion as a panacea for poverty reduction in Nigeria. It employed the Johansen cointegration test and the Granger causality test as an analytical technique based on the outcome of the unit root test conducted. The study found that the Trace test indicates eight co-integrating variables while the maximum Eigenvalue indicates three co-integrating variables at a 5% level of significance. The result showed that there exists a long-run relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. The Error Correction Mechanism (ECM) test revealed that about 29 per cent of disequilibria in Nigeria's poverty gap ratios in the previous years are corrected for in the current year. The Granger causality result revealed that the financial inclusion index, government revenue, government expenditure, money supply, interest rate, and the number of deposit money banks do not have a causal relationship with poverty gap ratios, while inflation rate as a uni-directional causal relationship with poverty gap ratios in Nigeria and conclude that there is no causal relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. Based on the findings, the study recommended that the financial sector in Nigeria needs to expand financial markets and engineer financial services and products particularly dedicated to the requirement of the low-income and rural segment of the population to ensure the availability, accessibility, and usability of financial services, thereby aiming to eradicate poverty and reduce income inequality in the rural and urban areas.*

**Keywords:** *Financial Inclusion, Government Revenue, Government Expenditure, Macroeconomic Stability, Poverty Reduction*

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### 1. Introduction

Globally, governments, scholars, and economists regard financial inclusion as a key tool for poverty reduction, job creation, wealth development, and enhancing people's welfare and standard of existence. This is due to its impact on poverty reduction, the notion has gained popularity in recent years (Felix, Kayit, & Ismail 2022). In this context, financial inclusion refers to the supply of financial services, mostly to the private sector, to anyone who could benefit from them. Though low financial literacy, insufficient infrastructural facilities, and insufficient and inefficient technology-based facilities required by financial institutions have all hampered the realization of large expansions in financial inclusion levels in Nigeria (Felix, et al. 2022; Abdullah, & Kazuo, 2020; Kama, & Adigum 2013).

Many governments throughout the world have been targeting financial inclusion, or the development of financial systems, financial services, or financial goods to reach every single user in the economy, in recent years. According to statistics, more than 60 countries have made financial inclusion a formal aim (Abdullah, & Kazuo, 2020; Vo, Van, Vo, & McAleer 2019). The underlying implication of financial inclusion is to give low-income people and small businesses equal access to financial services. Financial inclusion contributes to the expansion of a financial network and the efficient flow of funds inside a country's borders. Furthermore, financial inclusion tries to make formal financial services (such as bank and savings accounts, payment services, loans, and insurance) available to clients so that they can actively and effectively meet their demands. All financial inclusion functions are projected to promote individuals' personal well-being, eliminate poverty, and boost economic growth and development (Vo et al., 2019).

Looking at this from another angle, poverty as a global phenomenon has continued to capture the attention of various governments, civil society organizations, donor agencies, and international organizations, among others, particularly in developing countries where the rate is already alarming despite efforts to reduce the threat. Indeed, Africa is by far the poorest continent in the world, home to 28 of the world's poorest countries, with half of the population estimated to live in poverty without access to basic human needs such as nutrition, clean water, and shelter, and more than 75% of Africans living on less than \$1.90 USD per day in 2019. Though poverty levels on the continent are expected to fall, Africa remains the poorest region in the world (World Bank, 2019).

The poverty situation in Nigeria is highly serious; widespread and severe poverty displays a lack of food, clothing, education, and other essential necessities. Severely impoverished people lack the most essentials of existence to such an extent that it is difficult to imagine how they survive (Felix, Sale, & Adegoke, 2019). Meanwhile, the financial inclusion of the poor in Nigerian society has fostered a variety of economic activities and boosted national productivity growth. However, the continuous rise in poverty in Nigeria is attributable to the difficulties of financial exclusion (Felix et al. 2022). As a result, financial inclusion has been hailed as a powerful instrument for combating the three evils: unemployment, inequality, and poverty, particularly in Nigeria, which has been dubbed "the home of poverty" due to its large population of impoverished people. Similarly, financial inclusion has been identified as a means of achieving 7 of the 17 Sustainable Development Goals (SDGs), including eliminating extreme poverty and encouraging economic growth, innovation, and sustainable industrialization (World Bank, 2018).

According to Anthony, Ageme, Anisiuba, Hillary, & Onwumere (2018) and Felix et al, the main reason for increased poverty and unemployment among underprivileged populations is a lack of financial inclusion of disadvantaged people and the poor in any jurisdiction. As a result, access to financial services has been extremely limited, particularly in underdeveloped countries. Extending financial inclusion can be crucial for higher living standards and, by implication, poverty reduction. Furthermore, the Nigerian government and monetary authorities have implemented several policies aimed at increasing financial inclusion in the economy, such as the National Financial Inclusion Strategy (NFIS) and the establishment of community and microfinance banks to facilitate access to formal financial services.

The purpose of this policy is to reduce the number of Nigerians without access to financial services from 46.3% to 20% by 2020 to address the country's wave of poverty. Despite these regulatory initiatives in Africa's largest economy, many adults in Nigeria do not have a formal banking account. Furthermore, the Nigerian poverty rate increased to 93 million in 2020, with an extra 7 million people falling into extreme

poverty (World Bank 2020). The broad objective of this study is to evaluate the impact of financial inclusion as a panacea for poverty reduction in Nigeria; specifically, to examine the long run relationship between the financial inclusion variables, macroeconomic variables, and poverty reduction in Nigeria; and, to ascertain the causal relationship between the financial inclusion variables, macroeconomic variables, and poverty reduction in Nigeria. The study will be significant to the government, policymakers, financial institutions, and scholars.

## **2. Literature Review and Theoretical Framework**

Financial inclusion, according to the World Bank (2020), means that individuals and businesses have access to usable and affordable financial products and services that fulfil their needs, such as transactions, payments, savings, loans, and insurance, that are supplied ethically and sustainably. Access to a transaction account is the first step toward greater financial inclusion because it allows people to save, transfer, and receive payments. Poverty, on the other hand, is described as a person's inability to meet fundamental necessities such as food, water, housing, health, and education. Poverty is also defined as a severe lack of fundamental human necessities such as food, shelter, safe drinking water, sanitary facilities, information, and education due to a lack of both income and access to services (World Bank, 2019). Financial inclusion has been found to be negatively associated with macroeconomic stability, either by increasing financial risks or by decreasing macroeconomic stability, according to Morgan and Pontines (2018). They believed that financial inclusion broadened the pool of borrowers, decreasing lending norms and circumstances and, as a result, increasing economic and financial risks. A rise in lending to microfinance firms without sufficient oversight may damage the overall efficacy of a country's legislation, heightening risks in the financial system.

Scholars have shown an appreciable level of interest in trying to unravel the interaction between financial inclusion, macroeconomic stability, and poverty reduction in recent times. Koomson, Ansong, Okumu, and Achulo, (2023) investigated the direct and indirect effects of financial literacy on poverty through financial inclusion and entrepreneurship. A Probit model was used in the investigation. The study discovered that entrepreneurship and financial inclusion operate as change mechanisms via which financial literacy reduces poverty which indicates a positive impact, with findings varying by gender and location. These findings indicate that financial literacy has a poverty-reducing effect, primarily in Tanzania, followed by Kenya and Uganda. The findings help to understand how financial literacy and poverty interact and can be used to inform contextually relevant treatments and policies.

The impact of financial inclusion on poverty reduction in Nigeria was investigated by Felix, Kayit, and Ismail (2022). The Autoregressive distributed lag was used in the investigation. In the short run, the study discovered that bank branch spread, rural deposits, interest rate, government expenditure, and GDP growth have a negative and significant impact on poverty reduction, whereas credit to the private sector has a positive and significant impact on poverty reduction. Meanwhile, the results show that in the long run, bank branches spread; GDP growth has a negative and large influence on poverty reduction, whereas credits to the private sector and government expenditure have a positive and significant impact on poverty reduction. According to the report, the government should provide appropriate infrastructure, such as a road network, adequate electrical supply, communication networks, and other utilities, particularly in rural areas, to allow deposit banks to open more branches.

Over a sample of 75 developing and developed countries, Elisa, Gonzalo, and Olga(2022) investigated the positive moderating influence of institutional quality on the connection between financial inclusion and poverty reduction. As an analytical technique, the study used the Panel data approach with a fixed effect.

According to the study, institutional quality increases the beneficial benefits of financial inclusion on poverty rates. This effect is stronger in poorer economies than in richer ones. The findings have significance for policymakers interested in addressing the institutional causes of poverty. According to the study, efforts to improve institutional quality by combating corruption, when combined with expanded financial inclusion, can alleviate poverty in the poorest economies to a higher extent than improving institutional quality alone.

Using panel data from 54 African nations, Khan, Khan, Sayal, and Khan (2021) investigate the influence of financial inclusion on poverty, income inequality, and financial stability. The study employed multiple regressions across an unbalanced panel data set of 54 African countries, with the mean value calculated over four years. The findings indicate that financial inclusion (FI) is an important indicator since it reduces poverty, and income inequality, and promotes financial stability. According to the findings, the African financial sector needs to expand financial markets and engineer financial services and products that are specifically tailored to the needs of the low-income population to ensure the availability, accessibility, and usability of financial services, thereby aiming to eradicate poverty and reduce income inequality. The government and authorities should implement suitable policies to expand financial service networks in rural areas.

Emeka and Alugbuo (2021) investigated the impact of financial inclusion on poverty alleviation in Nigeria. The Logit model and an Instrumental variable model were used in the investigation. The dependent variable was a dummy variable called "poor," and the explanatory variables were the author's financial inclusion index, respondents' age, educational level, gender, employment status, wage payment, government transfers, pension, savings, self-employment income, and wage earnings. Even after adjusting for endogeneity in the explanatory factors, the study found that financial inclusion reduces household poverty in Nigeria.

Vo, Van, Vo, and McAleer (2019) evaluated the links between financial inclusion and macroeconomic stability in 22 emerging and frontier nations, a topic that has received little attention in the literature. The panel threshold estimation technique was used in the study. Under a specific threshold, financial inclusion, as represented by the growth rate in the number of bank branches with over 100,000 account holders, is found to improve financial stability, according to the study. Financial inclusion has also been shown to aid the maintenance of stable inflation and economic growth. The policy implications of the key empirical findings are also examined.

Bakari, Donga, Idi, Hedima, Wilson, Babayo, and Ibrahim (2019) investigated the role of financial inclusion in poverty reduction in 49 Sub-Saharan African nations. To evaluate the data, the study used a static panel data model. The study discovered that savings, private sector credit as a percentage of GDP, access to ATMs, access to information technology, inflation, and government spending all play important roles in poverty reduction. While interest rates and economic growth were found to exacerbate poverty, explaining a 124 and 14.8% increase in poverty, respectively. According to the study, apex regulatory authorities could lower policy rates to encourage low-income workers to use formal financial resources, as well as reintroduce rural banking programs and inexpensive internet services in both urban and rural areas.

An examination of the existing literature reveals several trends in the findings. Felix, *et al* (2022) and Bakari, *et al* (2019) showed a negative connection between financial inclusion, macroeconomic stability, and poverty reduction variables. However, Ansong, *et al* (2023), Elisa, *et al* (2022), and Khan, *et al* (2021) discovered a positive relationship between financial inclusion, macroeconomic stability, and poverty reduction variables. The general conclusion from these studies is that the results vary depending on a variety of factors such as sample periods, methodology used, estimation techniques, variables used, and countries considered

(developing or developed countries). Even though the results have been mixed, there may have been some omissions, prompting additional research in this area. This study, therefore, included a new variable which was not used by the previous studies mentioned such as number of deposit money banks in Nigeria and inflation rate as additional variables to financial inclusion and macroeconomic stability. Also, by extending the scope of the study to capture the recent happening in this area of study

## **2.1 Theoretical Literature**

### ***The Free Market Theory of Financial Inclusion***

The free-market theory was propounded by Milton Friedman in the 20<sup>th</sup> century. The free market hypothesis, commonly known as "the shareholder's wealth maximization theory," discusses the macroeconomic factors of financial inclusion. It is predicated on the notion that market forces can best decide access to financial services and that a free-market economy may achieve optimal financial inclusion. Government action in the financial system, in the form of controls and reforms, on the other hand, can exclude specific sectors of society from the financial system, increasing the poverty rate of the disadvantaged group. In a free market economy, financial service providers are involved in financial service transactions to supply and access funds utilized to carry out their everyday activities (Felix, 2022; Morgan & Pontines 2018).

Competition among financial service providers may force them to devise less expensive methods, such as knowing your customer Tier one, two, and three, internet banking, mobile banking, point of sale devices, children accounts, and so on, with the goal of inducing people to open an account and access other financial services available, thereby increasing access to financial services. The notion that a free market and deregulated financial systems always result in the spawning of financial goods underpins the proposition that a market-friendly system enhances the rate of financial inclusion rather than exclusion. In contrast, the general population, to meet their daily commitments, uses accessible financial services to finance their daily necessities such as education, health, shelter, and other amenities that would improve their living quality, hence lowering their poverty rate (Felix, 2022; Vo, *et al* 2019).

### ***Theories of Financial Inclusion Beneficiary***

There are differing opinions or perspectives on who benefits from financial inclusion results. Some studies contend that poor people are the ultimate beneficiaries of financial inclusion (Bhandari, 2018), while others believe that women are the ultimate beneficiaries of financial inclusion outcomes (Ghosh and Vinod, 2017), and still others believe that the economy and financial system are the ultimate beneficiaries of financial inclusion (Kim et al, 2018; Ozili, 2018).

### ***A Public Good Theory of Financial Inclusion***

According to the public good theory of financial inclusion, the supply of formal financial services should be considered a public good. The theory argues that formal financial services are a public good that should be available to everyone for the benefit of all. Everyone should have unrestricted access to finance. As a public benefit, one person's access to formal financial services does not decrease their availability to others. This means that everyone can be brought into the formal financial system, and everyone will be better off as a result. According to this view, all members of the population benefit from financial inclusion, and no one is excluded (Ozili 2020).

An individual or small business that establishes a formal bank account may be issued free debit cards under the public good premise of financial inclusion. They can conduct transactions using Automated Teller Machines (ATMs) without being charged a transaction fee. Financial institutions and other providers of formal financial services will carry the expense of providing formal financial services as a sunk cost of doing business. The government can provide financial institutions with subsidies to help them deal with any cost issues that occur because of providing free formal financial services to citizens. There are three advantages to the public good theory of financial inclusion. To begin, the public good hypothesis proposes that financial inclusion benefits everyone, regardless of status, income level, or demographic variations. Second, the government will subsidize the cost of providing formal financial services to citizens as a public good. Third, as a public benefit, it provides an opportunity for the government to take responsibility for achieving financial inclusion (Ozili 2020; Bakari, *et al* 2019).

Three flaws exist in the public good theory of financial inclusion. To begin with, viewing the provision of formal financial services to citizens as a public good ignores the root cause of financial exclusion. Second, by recognizing the provision of formal financial services to individuals as a public good, the government will be required to subsidize the cost of providing formal financial services to residents. Such subsidies might deplete public revenues, leaving inadequate funds to carry out other critical public projects. Third, the public good hypothesis presumes that the supply of formal financial services as a 'public good' is free or very low cost to consumers of formal financial services. When formal financial services are considered a public good, the degree of financial inclusion may not be sustainable in the long run, even if backed by public investment (Ozili 2020; Elisa, *et al* 2022).

#### ***Dissatisfaction Theory of Financial Inclusion***

According to the hypothesis, it is easier to persuade this set of persons to return to the formal financial sector than it is to persuade those who have never been in the official financial sector to return. This theory implies that individuals of the public who have left the formal financial system should be the primary target of financial inclusion programs before extending them to other parts of the population. Banked adults may become dissatisfied for a variety of reasons, including financial fraud, debit or credit card fraud, financial theft, long waiting hours before depositors can withdraw funds, payments taking too long to clear, high transaction costs, excessive bank charges, and so on (Ozili 2020; Morgan & Pontines 2018). According to the dissatisfaction theory of financial inclusion, financial inclusion programs in a country should first target all individuals who were previously in the formal financial sector but left because they were dissatisfied with the rules of engagement in the formal financial sector or had an unpleasant personal experience when dealing with firms and agents in the formal financial sector. This idea proposes that if the areas of unhappiness in the formal financial sectors have been totally rectified, it is simpler to draw back people who left because they were dissatisfied.

The financial inclusion unhappiness theory has some advantages. To begin, the theory makes a concerted effort to address the 'voluntary financial exclusion' issue. It minimizes the level of voluntary financial exclusion by persuading persons who left the formal financial sector due to unhappiness to return. Second, it is simple to identify the poor members of the population. Adults who were previously banked but are now unbanked can be easily identified because their personal information is recorded with financial institutions. They can be convinced to return to the official financial industry. Reaching out to previously banked adults is easier than reaching out to parts of the population who have never participated in the formal financial sector. Third, according to this view, achieving financial inclusion does not necessitate the use of public funds because it is heavily reliant on interpersonal persuasive skills and competencies (Ozili 2020, Felix, *et al* 2022).



There are numerous drawbacks to the discontent theory of financial inclusion. For starters, the approach does not promote financial inclusion for all members of the population. People who have never worked in the official financial sector are barred from applying. Second, the dissatisfaction theory implicitly assumes that financial exclusion is driven by customers' discontent with the formal financial sector's norms of interaction. This may not be the case in some cases because people can choose to leave the official financial sector for a variety of reasons, including religious and personal beliefs (Ozili, 2020). Finally, if social culture relies too heavily on the formal financial sector to live a pleasant life, individuals who are unsatisfied with the behaviour of financial institutions in the official financial sector may have no alternative but to remain in the formal financial sector.

### 3. Methodology

The study evaluated the impact of financial inclusion and macroeconomic stability as a panacea for poverty reduction in Nigeria. The study made use of annual time series data and adopted the factorial experimental research design which allows the researcher to examine the effect of two or more independent variables simultaneously on the dependent variable and strengthen the external validity of the study. It employed the Johansen cointegration test and the granger causality test as analytical technique based on the outcome of the unit root test conducted. Annual time series data from the World Development Indicators (2021) and the Central Bank of Nigeria Statistical Bulletin (2021) covering the period of 1981 to 2021 was use.

#### 3.1 Model Specification

This study adapted the work of Felix, Kayit, & Ismail, (2022) who studied the impact of financial inclusion on poverty reduction in Nigeria using Autoregressive Distributed Lag (ARDL). The co-integration test is used in this study based on the outcome of unit root test to determine the both the long-term and causal relationship between the financial inclusion variables, macroeconomic variables, and poverty reduction in Nigeria. The study also established the short-run error correction mechanism. The study's functional relationship between variables is expressed as follows:

$$PGR = f(FII, GOR, GOE, MS, INTR, INF, DMB) \quad (1)$$

$$PGR = \beta_0 + \beta_1 FII + \beta_2 GOR + \beta_3 GOE + \beta_4 MS + \beta_5 INTR + \beta_6 INF + \beta_7 DMB + \mu_t \quad (2)$$

Where:

PGR: Poverty Gap Ratios

FII: Financial Inclusion Index

GOR: Government Revenue

GOE: Government Expenditure

MS: Money Supply

INTR: Interest Rate

INF: Inflation Rate

DMB: Number of Deposit Money Banks in Nigeria

$\beta_0$ : Constant

$\beta_1$  to  $\beta_7$ : Parameters

$\mu_t$ : Error term

Log-linear some variables in equation 2 to give: Note: PGR, INTR and INF were not log linearize since the data are already in rate:

$$PGR = \beta_0 + \beta_1 infii + \beta_2 ingor + \beta_3 ingoe + \beta_4 inms + \beta_5 INTR + \beta_6 INF + \beta_7 indbm + \mu_t \quad (3)$$

After obtaining the long-run relationship, to estimate the short run relationship, the corresponding error correction equation is given as below:

$$\Delta PGR_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta Infii_{t-i} + \sum_{i=1}^p \beta_2 \Delta Ingor_{t-i} + \sum_{i=1}^p \beta_3 \Delta ingoe_{t-i} + \sum_{i=1}^p \beta_4 \Delta inms + \sum_{i=1}^p \beta_5 \Delta INTR + \sum_{i=1}^p \beta_6 \Delta INF + \sum_{i=1}^p \beta_7 \Delta indmb + \psi ECM_{t-1} + \mu_t \quad (4)$$

The  $ECM_{t-i}$  is the error correction term. The coefficient of the  $ECM_{t-i}$  measures the speed of adjustment toward the long run equilibrium

The study employed the Augmented Dickey Fuller (ADF) unit root test to determine whether the time series is stationary because time series data typically follow a specific trend and economic theory requires such data to be subjected to a stationarity test to avoid spurious results. This will also help the researcher in determining which research technique to use. For the study, all variables were integrated at order one I (1) using the ADF tests. This implies that at the first difference, all variables were integrated. Based on the unit root test results, the Johansen cointegration test and Granger causality were used in this study to determine the long-run and causal relationship between variables in the model. If there is evidence of cointegration in the model, the study will also conduct a valid error correction mechanism test to ascertain the short-run relationship.

#### 4. Results and Discussion

The results of this study are presented in the following order unit root test, co-integration test result, the Granger causality, and the error correction mechanism test.

##### Unit Root Test

The orders of integration of the variables are examined using the Augmented Dickey-Fuller (ADF) test statistics. The result presented in Table 1 below shows that all variables achieved stationarity at first differencing at 5% critical value. Based on the result, the study will use cointegration test to analyze the objective of the study:

**Table 1: Unit Root Test**

Variables	ADF	5% Critical Value (*)	Prob. *	Order of Integration
PGR	-6.003559	-2.936942	0.0000	I (1)
FII	-3.841666	-2.941145	0.0017	I (1)
GOR	-6.133469	-2.938987	0.0000	I (1)
GOE	-4.214311	-2.960411	0.0000	I (1)
MS	-3.730570	-2.951125	0.0080	I (1)
INTR	-4.987883	-2.941145	0.0002	I (1)
INF	-3.009166	-2.936942	0.0425	I (1)
DMB	-4.136248	-2.938987	0.0025	I (1)

**Source:** Author's Computation using E-View 9.

##### Co-integration Test

Based on the unit root test, which revealed that all variables were stationary and integrated at order one, the linear combination of one or more of these variables could demonstrate a long-run connection. The multivariate co-integration methodology described by Johansen (1990) was used to capture the level of cointegration among the variables to fulfil the specified goal of determining the long-run link between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. The trace test and maximum



eigenvalue from this technique were used to determine the number of co-integration vectors, and the findings are shown in Tables 2 and Table 3:

**Table 2: Unrestricted Cointegration Rank Test (Trace)**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.889810	259.8966	159.5297	0.0000
At most 1 *	0.722155	173.8801	125.6154	0.0000
At most 2 *	0.655785	123.9331	95.75366	0.0002
At most 3 *	0.529580	82.34002	69.81889	0.0036
At most 4 *	0.400848	52.92895	47.85613	0.0155
At most 5 *	0.344528	32.95162	29.79707	0.0210
At most 6 *	0.243183	16.47804	15.49471	0.0355
At most 7 *	0.134008	5.611319	3.841466	0.0178

**Source:** Author’s Computation using E-View 9

**Table 3: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.889810	86.01644	52.36261	0.0000
At most 1 *	0.722155	49.94700	46.23142	0.0192
At most 2 *	0.655785	41.59310	40.07757	0.0335
At most 3	0.529580	29.41106	33.87687	0.1557
At most 4	0.400848	19.97734	27.58434	0.3427
At most 5	0.344528	16.47357	21.13162	0.1984
At most 6	0.243183	10.86672	14.26460	0.1610
At most 7 *	0.134008	5.611319	3.841466	0.0178

**Source:** Author’s Computation using E-View 9

The trace test indicates eight co-integrating variables while the maximum eigenvalue indicates three co-integrating variables at a 5% level of significance. The result, therefore, suggests that there exists a long-run relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. Hence, there is a need to carry out an error correction mechanism test (ECM). The usual method for modeling time series equations is an Error Correction Mechanism (ECM). The ECM allows for handling non-stationary data series and separating handling of non-stationary data series and the separation of the long and short-term:

**Error Correction Model Test**

The result in the Table above shows that the coefficient of error correction mechanism (ECM) is negative - 0.298006 and significant at 0.05 per cent critical level. This shows that about 29 per cent of disequilibria in Nigeria’s poverty gap ratios in the previous years are corrected for in the current year. Alternatively put, in this study, the error correction coefficient is -0.298006. The coefficient reveals that the speed of adjustment between the short-run and long-run realities of the cointegrating equations is 29% within a year. This result is presented in Table 4:

**Table 4: Error Correction Model Result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.122803	1.454178	0.084449	0.9332
D(FII)	2.257874	1.931613	1.168906	0.2514
D(GOR)	-0.000156	0.000926	-0.168764	0.8671
D(GOE)	-0.004073	0.003305	-1.232315	0.2271
D(MS)	0.000480	0.001024	0.469051	0.6423
D(INTR)	-0.835022	0.647683	-1.289244	0.2069
D(INF)	-0.013232	0.075570	-0.175092	0.8621
D(DMB)	0.003082	0.004216	0.730885	0.4703
ECM(-1)	-0.298006	0.185046	-1.610442	0.0000
R-squared	0.645056			
F-statistic	7.042219			
Prob(F-statistic)	0.000028			
Durbin-Watson stat	1.953525			

**Source:** Author’s Computation using E-View 9

The significance of the ECM is an indication and a confirmation of the existence of a long run equilibrium relationship between innovation in Nigeria and all the explanatory variables. This shows exactly what needs to be done to absolve the short-run dynamics of the relationship. Again, the significance of ECM (-1) holds that a negative and statistically significant error correction model coefficient is necessary for the variables to be co-integrated.

**Granger Causality Test**

This test is conducted to identify the nature of the causal relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. Decision rule: reject  $H_0$  if the probability value is lower than 0.05 and accept  $H_0$  if otherwise. The result is presented in Table 5 below:

**Table 5: Granger Causality Test Result**

Null Hypothesis	Obs	F-stat	Prob	Decision	Type of Causality
FII does not Granger Cause PGR	39	1.15408	0.3274	Accept $H_0$	No causality
PGR does not Granger Cause FII		1.67825	0.2018	Accept $H_0$	No causality
GOR does not Granger Cause PGR	39	0.84842	0.4370	Accept $H_0$	No causality
PGR does not Granger Cause GOR		0.10359	0.9019	Accept $H_0$	No causality
GOE does not Granger Cause PGR	39	0.08894	0.9151	Accept $H_0$	No causality
PGR does not Granger Cause GOE		2.20054	0.1263	Accept $H_0$	No causality
MS does not Granger Cause PGR	39	0.03574	0.9649	Accept $H_0$	No causality
PGR does not Granger Cause MS		1.03680	0.3655	Accept $H_0$	No causality
INTR does not Granger Cause PGR	39	0.90038	0.4159	Accept $H_0$	No causality
PGR does not Granger Cause INTR		0.40962	0.6671	Accept $H_0$	No causality
INF does not Granger Cause PGR	39	0.65461	0.0261	Reject $H_0$	Uni-directional Causality
PGR does not Granger Cause INF		0.42889	0.6547	Accept $H_0$	Uni-directional Causality
DMB does not Granger Cause PGR	39	1.59502	0.2177	Accept $H_0$	No causality
PGR does not Granger Cause DMB		2.27732	0.1180	Accept $H_0$	No causality

**Source:** Author’s Computation using E-View 9

The Granger causality result revealed that financial inclusion index, government revenue, government expenditure, money supply, interest rate, and number of deposit money banks does not have a causal relationship with poverty gap ratios, while inflation rate has an un-directional causal relationship with poverty gap ratios in Nigeria. Based on the results, there is not causal relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria.

## **5. Conclusion and Recommendations**

### **5.1 Conclusion**

This study evaluated the impact of financial inclusion as a panacea for poverty reduction in Nigeria; specifically examined the long run relationship between the financial inclusion variables, macroeconomic variables, and poverty reduction in Nigeria; and ascertained the causal relationship between the financial inclusion variables, macroeconomic variables, and poverty reduction in Nigeria. The study made use of annual time series data and adopted the factorial experimental research design which allows the researcher to examine the effect of two or more independent variables simultaneously on the dependent variable and strengthen the external validity of the study. The study employed the Johansen cointegration test and the Granger causality test as an analytical technique based on the outcome of the unit root test conducted.

The unit root test revealed that all variables are stationary at order one. The co-integration test shows that the trace test indicates eight co-integrating variables while the maximum eigenvalue indicates three co-integrating variables at a 5% level of significance. The result, therefore, suggested that there exists a long-run relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. The error correction mechanism test above shows that the coefficient of error correction mechanism (ECM) is negative - 0.298006 and significant at 0.05 per cent critical level. This shows that about 29 per cent of disequilibria in Nigeria's poverty gap ratios in the previous years are corrected for in the current year. The Granger causality result revealed that the financial inclusion index, government revenue, government expenditure, money supply, interest rate, and the number of deposit money banks do not have a causal relationship with poverty gap ratios, while the inflation rate has an un-directional causal relationship with poverty gap ratios in Nigeria. Based on the results, there is no causal relationship between financial inclusion, macroeconomic stability, and poverty reduction in Nigeria. This shows a similar characteristic to the trend of Nigeria's economy in recent times.

### **5.2 Recommendations**

Based on the findings, the study recommended that the financial sector in Nigeria needs to expand financial markets and engineer financial services and products particularly dedicated to the requirement of the low-income and rural segment of the population to ensure the availability, accessibility, and usability of financial services, thereby aiming to eradicate poverty and reduce income inequality in the rural and urban areas. The government and policymakers should put in place adequate policies to expand the networks of financial services in rural areas. Further, the financial regulator may help the financial service providers to reach the unbanked population to bring them into the formal economy. Regulations shall be put in place to allow low-income people and households and small businesses to have deposit accounts and availability of ATMs to access and use financial services in rural areas. Moreover, the regulators and decision-makers shall develop a strategy to abolish constraints related to the provision of collateral in the case of small loans and credit for businesses.

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