FINANCIAL INCLUSION, DOMESTIC INVESTMENT AND SELECTED MACROECONOMIC PERFORMANCE IN NIGERIA

Akeeb Olushola Oladele[1]; Alwell Nteegah[2]; Okechuku Onuchuku[3] and Monday Olulu Robinson[4]

[1]Department of Economics, Faculty of Social Sciences University of Port Harcourt, Nigeria.

[2]Department of Economics, Faculty of Social Sciences University of Port Harcourt, Nigeria.

[3]Department of Economics, Faculty of Social Sciences University of Port Harcourt, Nigeria.

[4]Department of Economics, Faculty of Social Sciences University of Port Harcourt, Nigeria.

Abstract

The high level of unbanked public and the need to improve the performance of the economy through financial inclusion, make it imperative to investigate how financial inclusion has reduced unemployment, poverty and stabilised prices in Nigeria. To achieve the objectives of the paper, time series data were sourced and analysed using the Autoregressive and Distributed Lag (ARDL) technique. The results show that: Credit penetration, deposit penetration and domestic investment were positively and insignificantly related to unemployment rate in the long run. In the short run, credit penetration, deposit penetration and domestic investment penetration were negatively but significantly related to unemployment rate. Bank's branches penetration was negatively related to unemployment in the long run but positively linked to unemployment rate in the short run. This implies that banks penetration retarded unemployment in the long run but does not in the short run. Hence financial inclusion had significant implication on unemployment in the short run and less impact on unemployment in the long run. The long and short-run results of the poverty rate model shows that deposit penetration, branches penetration and investment penetration all had negative and significant relationship with poverty. This implies that financial inclusion significantly retarded poverty in Nigeria. Financial inclusion has mix implications on price stability both in the short and long run. The results also show that the macroeconomic variables adjust speedily to changes in financial inclusion. The goodness of fit shows that financial inclusion has serious implication on macroeconomic performance in Nigeria. Based on these findings, the study concludes that financial inclusion has significant implications on poverty and less impact on unemployment hence recommends: increase in deposit mobilisation through savings, domestic credit and banks' branches to create jobs and reduce poverty in Nigeria.

Keywords: Deposit, credit, Banks, penetration, inclusion, Poverty, employment and price level

i. Introduction

Achieving improve macroeconomic performance through financial intermediation remain a crucial role of monetary system and government of most less developed nations like Nigeria. This is evidenced in debate on connections between monetary sector advancement and monetary growth over years. In older study, Robinson (1952) argued that "when firm's profits grow properly, it improves the growth of financial wellbeing in the community, therefore, to the

author, finance does not directly leads to economic growth, and instead it reacts to the demands of the productive sector of the economy before stimulating growth".

However, scholars like Schumpeter (1911), Garley and Shaw (1955), Gold-smith (1969) and Mc-Ken (1973) argued on need to examine rational on monetary sector ability to stimulate monetary performance due to accessible funding boost. Romer (1986) state that monetary inclusion is a kind of role of monetary sector in encouraging endogenous growth via positively contributing to fund gathering through investment and savings. Over years, the stance on monetary sector connection with monetary performance took importance in scholarly and policy studies. Several propositions are initiated to examine development based on local savings, fund gathering technology inventions, revenue increment and monetary intermediation (Levine et al., 2000 and Andrienova & Dematriade, 2008).

Notwithstanding, activities in monetary sector are expected trigger "financial inclusion" a situation Kim et al. (2018) saw as: "the ease of accessibility and availability of the formal monetary-services, such as bank deposit, credits, insurance, among others., for all participants in an economy" The connection between monetary inclusion and real sectors on monetary growth, develops into idea of "trickle down effect," means that it motivates growth, and poverty mitigation because of revenue distribution (Beck et al., 2007).

Though hindering fundamental monetary services seems to be common in less developed nation like Nigeria due high poverty level, unaccounted economic activities from underground economy and local nature of most areas and settlements. The CBN (2016) report on national monetary inclusion technique revealed that nearly 58% of Nigeria which represent over 95 million adults do not have access to fundamental and cheap monetary services. This number is composed of over 35% of banked public, 10% served by other monetary firms and 9% serviced by non-formal monetary service providers.

Nigeria government recognising critical part access to cheap monetary services play in economic advancement process is most populous Africa nation with population of over 200 million has currently presented through CBN policies and reforms on financial inclusion in order to capture more Nigeria adults into the banking public. One of these is National Financial Inclusion Strategy (NFIS) introduced in 2012. This technique provides blue-print targeted at directing activities of every stakeholders in advancing simpler monetary services. The key drivers of measure are agent banking, Tiered "Know–Your-Customer (KYC)" requirement, financial literacy, buyer's protection, linking banking, execution of micro, small and medium scale Enterprises Development Fund (MSMEDF) and credit enhancement programmes (CEPs). The CEPs includes Nigerian Incentive-Based Risk sharing system for agricultural lending (NIRSAL), re-funding and re-discounting platforms for SMEs guarantee program and establishing entrepreneurship advancement centres among others (Yaaba, 2017)

The above efforts by government and monetary authorities seem to produce results. For instance, record of CBN also revealed that percentage of Nigeria adults that could access formal financial services increased from 36% in year 2010 to 40% in 2012, 48% in 2014 and did not change till 2016. The percentage of adult people that could access to monetary services rose consistently

from 30% for year 2010 to 32%, 36% then 38% for year 2012, 2014 and 2016 and other monetary service providers which includes: micro-finance-banks, insurance firms, pension funding and other service providers rose between 2010 by 6% and 2016 10%. Unregistered monetary service providers and monetary firms reduced from 17% in year 2010 to 8% in year 2016 which indicates that more adult Nigeria currently have access to formal financial services as outlined in technique.

Not minding efforts and outcome achieved by monetary authorities to improve monetary services and make them available and cheaper to public to improve performance of nations, real GDP increment rate which was estimated to rise at 2% in year 2019, deduced to -4% in 2020. The marginal increment noticed in 2019 compare to 2018 was mostly from transport, crude, Information and Communication Technology sectors and family consumption. Agriculture was negatively impacted because incessant flood and dispute between herdsmen and farmers. Manufacturing continues suffering from inadequate funding from monetary sector (AEO, 2020).

The measures utilized in lowering price level to 6 to 9%, range encountered structural and macro-economic constraints which includes: increasing food cost and arrears payments which result in rate estimated at 11% in year 2019. With monetary revenues lower than 7% of GDP, increased public expenses increases deficit, funded mostly by borrowing finally, in 2019, total government debt was $84b, 14% high compare to 2018. This government borrowing is 20% of GDP, up from 17% in year 2018. Local government debt amount to $56 billion and external government debt $2 billion. The share of bilateral debt in total debt was estimated at 12% and that of Euro-bonds at 40%.. At this juncture it is pertinent to ask the following questions (i) has the proportion of adult Nigerians who have access to financial services improve over the years? (ii) Does availability of monetary services to the public improve key macroeconomic indicators like: job creation, poverty reduction and stabilise prices in Nigeria? This paper seeks to answer these questions through empirical investigation. We shall continue our investigation by reviewing works carried out by past scholars on the topic, followed by outlining the methodology employed to address the questions raised, results, findings and concluding remarks.

ii. Literature Review

The Neo-structural theory arises as criticism on monetary liberalization by McKinnon-Shaw of 1973 using macro-economic perspective. Taylor in 1983 and van Wijnbergen in 1982, presented two arguments on this point, one was particular for developing nation. In these models they stated that "control or uncontrolled money markets play a vital part in deciding whether monetary liberalization can stimulate economic growth or not. If an increase in the real deposit interest rate leads to a shift of assets from the unorganised to the formal credit market, the existence of reserve requirements will lead to a decline in financial intermediation". In non-organised money-market, requirements do not exist and level of contraction impact on funding supply is ascertained by level to which assets are substituted-out from inflation or out from curb-market.

The other argument was based on price-push inflation that arises from elevated interest rates that could trigger effective demand collapse. Even though financial intermediation does not reduce,

this argument remains valid, because increase in chances to save could reduce demand. The neo-structural models are also based on assumption that "unorganised money markets are competitive which may not be the case". Another issue with these models is on fact that "they consider the aggregate credit and investment volume and not investment efficiency". The implications of this theory is that financial services provided by deposit money banks are critical for financial intermediation, economic growth and poverty alleviation. Less developed countries especially, Nigeria is faced with poor financial services and low income which cumulate into low level of investment, unemployment and poverty.

The detection of consequences of financial exclusion on macroeconomic performance first seen in the early work of Adam Smith in 1776 when he pointed-out crucial role of DMB in improving economic advancement. After several decades, precise in 2005, world leaders re-echoed it during "World Economic Summit". In this conference, World leaders ascribed critical roles to monetary-inclusion in attainment of MDGs. Consequent upon this development, Yaaba (2017) conclude that "economists as well as world leaders have recognised monetary-inclusion as a means of reducing income inequality, minimising the incidence of paucity and thus enhancing an all-inclusive participation in the development process".

Supporting this crucial role of financial-inclusion in the development process, Demirguc-Kunt et al (2017) in their work provided proof on how ease to cheap monetary services motivate people to make daily monetary transactions efficiently and safely and increase their investment and monetary risk handling options by using formal monetary system. They argued that "development is very common for people living in the poorest 40% of households". They also maintained that not all monetary products are operative in accomplishing advancement goals like poverty and inequality annihilation.

Kim et al. (2018) using dynamic panel estimation (DPE), Vector auto regression model (VAR), IRFs, and panel Ganger cause-based tests in their work and uncovered connection between access to monetary services provided by banks and monetary growth in Organization of Islamic Cooperation (OIC) nations. The outcome from their work also revealed that simple access to monetary services availed by banks positively affect monetary growth, and ease to monetary services and economic performance have mutual cause relations given panel ganger cause-based tests results.

Makena and Walle (2019) did similar work using dynamic panel estimation (DPE) and panel VAR on Africa nations perceived as low monetary-inclusion rated and uncovered that monetary inclusion captured by adult access to monetary services strongly and positively affect economic performance in Africa and their outcome and findings introduced to their fore efforts to compel financial inclusion program as among most absolute means for achieving or accomplishing inclusive growth in Africa. Similar work by Sharma (2016) uncovered direct connections between economic performance and access to monetary services captured using bank penetration, bank services availability and bank services usage. The findings from Sharma present prove to social bank experiments for India with deep bank institutions.

Uddin et al. (2012) used autoregressive distributed lag (ARDL) approach to examine connections between bank monetary services and poverty eradication in Bangladesh from year 1976 to 2010. There findings show that long time improve bank sector activities was linked with poverty alleviation. However, two-way cause-based connection exist between improve bank sector activities and poverty reduction was found in short run. Based on their findings, they suggested that government and financial sector operators must improve monetary sector in order to eradicate poverty and improve the performance of Bangladesh economy. These findings were also reinforced by another study in 2014 by same authors using same method ARDL and for Bangladesh. This time, they used growth variables in addition to data sourced between year 1970 to year 2011. Their findings this time indicated that policy and politic in Bangladesh have powers to reduce or eradicate poverty by availing funds to SMEs thereby, stimulating jobs and eradicating poverty.

Boukhatem (2016) studied how monetary-inclusion reduced poverty using panel analysis for data obtained 67 low and middle income nations over time period year1988 to year 2012. This author did not use growth variable like other works and findings revealed improvement in access to monetary services impact positively on poverty reduction. This result ignites call on policy-makers to consider program for increasing fund supply or bank-credit which contribute to enhancing people welfare and increase monetary transactions that triggers increased opportunities for fund gathering, revenue allotment and triggers family demand.

In another national based study on how improved monetary services availed by bank sector triggered monetary growth, Calderon & Liu (2002) uncovered that two-direction causation exist between improved monetary services and monetary growth. But this work reports different outcome for upcoming nations and advanced economies. The study uncovered that improved monetary services is highly growth friendly in advanced nation compare to less developed countries.

Grimm and Paffhausen (2015) in study to examine the impact of micro-credit on Joblessness across 54 economies with more of countries from Latin-America found that microfinance was not viable means of employment. The authors found that most micro-finance programmes are geared towards income stability instead of employing labour. The authors further submitted that it is difficult process to ensure that intervention programmes help to realised positive effect on job creation when it is aimed at maintaining present jobs with good welfare package and other good working conditions.

In similar study in sub-Sahara Africa by van-Rooyen et al (2012), they discovered from their investigation that micro-finance had less implication on employment. The investigation was carried out with data from 15 impact examinations on micro-credit and micro-savings schemes aimed at low-income individuals in sub-Sahara Africa countries. It was found that just about 2 out of 15 studies both micro-credits focused provided evidence of any effect on employment, while none of these studies of micro-savings-based interventions scheme conceived employment as an output. In another in Senegal to assess Plan Canada Youth Microfinance Project pilot initiative scheme in country aimed at enhancing relationship between youth savings and credit association and modern monetary firms to encourage youth have access to services provided by

modern monetary firms, Nayar (2014) discovered from his study that low start up levels likely determine whether youths do not want to save their earnings or seek services with modern monetary firms or that the youths were not willing to access services provided by formal monetary firms.

In country specific study by Ayadi et al., (2008) on impact of financial services improvement on monetary growth in post-SAP economy in Nigeria. Findings from this study show that "improvement in monetary services does not really stimulate economic growth". Onwioduokt (2007) in his study on "the effect of monetary sector development on the performance of the Nigeria's economy", He finds proof of one direction causality between monetary sector factors and monetary growth but does not uncover any evidence of feed-back on how monetary sector factor impacts positively on economic performance. Subbarao (2009), in his own work "the monetary services provision and economic prosperity" uncovered direct association between improvement in monetary wellbeing and improve monetary services assess specifically, amongst working poor in local areas which triggers local dwellers to save, invest and access fund facilities.

In another study in Nigeria on monetary-inclusion and economic performance by Babajide et al (2015) using OLS method, they found that monetary-inclusion is main factor that affects output and productivity which are salient determinants of economic performance in any nation. Based on these findings, they suggest available nation resources should be utilised as alternative measure for growing Nigeria economy toward achieving sustained economic growth.

Samuel & Samuel (2020) studied "impact of monetary-inclusion on economic growth in Nigeria over the period 1990 – 2014" using OLS and ECM. The study uncovered ease to monetary services directly and seriously impact economic performance by monetary penetration factors like: broad money-supply, credit-to-private sector, loan deposit of local area and commercial banks liquidity ratio. Based on these findings, they suggest: that government and operators of monetary systems should ensure strict compliance to the rules and regulations guiding monetary activities in order to achieve needed results. The study also suggests that monetary-inclusion strategies should be geared toward improving the performance of the economy via increase in economic activities.

The review done so far shows that several studies have been done on the contributions and impact of monetary-inclusion on monetary growth in developed and upcoming nations. Most of these studies consulted are cross country type while others are country specific ones. For instance, Boukhatem (2016) studied how monetary-inclusion helped in reducing paucity using panel analysis for 67 low and mid revenue countries. Makina and Walle (2019) used DPE and panel VAR to examine monetary-inclusion and monetary increment in Africa nations. Kinn et al (2018) used DPE and panel VAR to examine how monetary services availed by banks affect monetary growth in OICs. On country specific study, Uddin et al (2012) used ARDL approach to investigate how monetary-inclusion alleviates paucity in Bangladesh between 1976 – 2010 and 1970 – 2011. Samuel and Samuel (2020) used OLS to study impact of monetary-inclusion on monetary increment in Nigeria over period 1990 to 2014.

While appreciating works from other scholars on the topic we are presently investigating, it is necessary to state that our study shall be guided by issues raised in the different studies consulted but will differ in methodology and scope. Most of the studies examined used credit to economy, savings and interest rate as key variables of monetary inclusion. They also focused more on monetary-inclusion and economic growth but few on poverty alleviation. This paper deviated from others by examining how monetary inclusion, domestic investment affects selected macro-economic performance like: Joblessness, price level and poverty level in Nigeria. Also in this study monetary-inclusion is proxy by number of accounts per one thousand adults Nigerians, local-credit to GDP ratio, local-deposit to GDP ratio and domestic investment. These are possible gaps this study intends to fill.

iii. Method

The identification of the crucial role of financial inclusion in enhancing economic performance was first emphasised in the early work of Adam Smith in 1776. He pointed out the crucial role of deposit money banks in enhancing economic growth and development. Later McKinnon and Shaw (1973) in their work argued strongly for financial liberalisation as a means of achieving sustainable growth. The Endogeneous growth model led by Romer (1986) also recognised the critical role of financial services in the growth process and poverty alleviation via human capital development. Grossman and Helpman (1991) specially argued that financial services provided by deposit money banks and security markets help investors to take up innovative activities which affects economic growth through productive investment. The NeoStructuralists however argued that financial sector plays a vital role in determining whether financial services provided by the sector could spur economic growth or not.

Empirically, Boukhatem (2016) studied how financial inclusion helped in reducing poverty using panel analysis for 67 low and middle income countries. Makina and Walle (2019) used dynamic Panel and panel VAR to examine financial inclusion and economic growth in African countries. Kinn et al (2018) used dynamic panel and panel VAR to examine how financial services provided by banks affect economic growth in Organisation of Islamic Countries (OICs). On the country specific study, Uddin et al (2012) used the Autoregressive and Distributed Lag (ARDL) approach to investigate how financial inclusion alleviate poverty in Bangladesh between 1976 – 2010 and 1970 – 2011. Samuel and Samuel (2020) used the Ordinary Least Squares (OLS) to study the impact of financial inclusion on economic growth in Nigeria over the period 1990 – 2014. While appreciating the various works done by other scholars, this shall follow the paths adopted by Uddin et al (2012) and Samuel and Samuel (2020) in its investigation and analysis. However, the choice of variables (both dependent and explanatory variables) are major points of departure from the studies mentioned above.

Based on these theoretical and analytical underpinnings, the seeks to achieve its objectives by specifying the following functional relationship between financial inclusion, domestic investment and selected macroeconomic performance as follows.

$$UNMR_t = f(NAPA_t, DCE_t, DDE_t, GCF_t, INTR_t) \qquad\qquad 1$$

$$POVR_t = f(NAPA_t, DCE_t, DDE_t, GCF_t, INTR_t) \qquad\qquad 2$$

$$INFR_t = f(NAPA_t, DCE_t, DDE_t, GCF_t, INTR_t) \qquad\qquad 3$$

For ease of estimation, the above macroeconomic functional relationships could be expressed in mathematical form thus:

$$UNMR_t = \alpha_0 + \alpha_1 NAPA_t + \alpha_2 DCE_t + \alpha_3 DDE_t + \alpha_4 GCF_t + \alpha_5 INTR + e_t \qquad 4$$

$$POVR_t = \beta_0 + \beta_1 NAPA_t + \beta_2 DCE_t + \beta_3 DDE_t + \beta_4 GCF_t + \beta_5 INTR + e_t \qquad 5$$

$$INFR_t = \delta_0 + \delta_1 NAPA_t + \delta_2 DCE_t + \delta_3 DDE_t + \delta_4 GCF_t + \delta_5 INTR + e_t \qquad 6$$

Where:

$\alpha_0, \beta_0 \,\&\, \delta_0 =$ intercept or autonomous component of macroeconomic performance; $\alpha_1 - \alpha_4, \beta_1 - \beta_4 \,\&\, \delta_1 - \delta_4 =$ parameter estimates

$UNMR_t$ = Unemployment rate; $POVR_t$ = Poverty rate; $INFR_t$ = Inflation rate; $NAPA_t$ = Number of bank account per 1000 adults/bank branch penetration; DCE_t = ratio of Domestic credit to GDP/ credit penetration; DDE_t = ratio of Domestic deposit to GDP/deposit penetration; GCF_t = ratio of Gross capital formation to GDP/investment penetration and $INTR_t$ = interest rate

The nature of information to be investigated in this study is predominantly quantitative; hence mostly secondary data were used in our analysis. These are information already published in text books, economics journals, Central Bank statistical bulletin etc. In nutshell, the study sourced it data from: Central Bank of Nigeria statistical bulletin, National Bureau of Statistics, and The World Bank data base.

For us to ascertain the long run capacity and short run dynamic interactions among the time series variables under study – Unemployment rate, poverty rate and inflation rate and deposit penetration, credit penetration, bank branch penetration, ratio of domestic investment to GDP and interest rate on loanable funds, we adopted also the Autoregressive distributed lag (ARDL) bound test approach to co-integration as formulated by Pesaran and Shin (1999) and Perasan et al (2001) due to its superiority over the Engle and Granger (1987) and Johnson Johansen's (1995) models. The ARDL cointegration technique as a general 12 vector autoregressive (VAR) model of order p, in Z_t,

Where: Z_{it} = column vector composed of the six variables: Y_{it} = selected macroeconomic variables (unemployment rate, poverty rate and inflation rate)

$Z_{it} = (Y_{it}\ DDE_{it}\ DCE_{it}\ NBPA_{it}\ GCF_{it}\ INTR_{it})'$ was also used. The null hypothesis of no cointegration is tested against the alternative hypothesis of cointegration. ARDL is therefore represented as follows:

$$D(Y_{it}) = \beta_{01} + \lambda_{1i}(Y_{t-1}) + \lambda_{2i}(DDE_{t-1}) + \lambda_{3i}(DCE_{t-1}) + \lambda_{4i}(NBPA_{t-1}) + \lambda_{5i}(GCF_{t-1}) + \lambda_{6i}(INTR_{t-1})$$

$$\sum_{t=1}^{p}\beta_{1i}D(Y_{t-1}) + \sum_{t=1}^{q}\beta_{2i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{3i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{4i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{5i}D(GCF_{t-1}) + \qquad 7$$

$$\sum_{t=1}^{q}\beta_{6i}D(INTR_{t-1}) + \varepsilon_{1i}$$

$$D(DDE_{it}) = \beta_{02} + \lambda_{2i}(Y_{t-1}) + \lambda_{3i}(DDE_{t-1}) + \lambda_{4i}(DCE_{t-1}) + \lambda_{5i}(NBPA_{t-1}) + \lambda_{6i}(GCF_{t-1}) + \lambda_{7i}(INTR_{t-1})$$

$$\sum_{t=1}^{p}\beta_{2i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{3i}D(Y_{t-1}) + \sum_{t=1}^{q}\beta_{4i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{5i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{6i}D(GCF_{t-1}) \qquad 8$$

$$+\sum_{t=1}^{q}\beta_{7i}D(INTR_{t-1}) + \varepsilon_{2i}$$

$$D(DCE_{it}) = \beta_{03} + \lambda_{3i}(Y_{t-1}) + \lambda_{4i}(DDE_{t-1}) + \lambda_{5i}(DCE_{t-1}) + \lambda_{6i}(NBPA_{t-1}) + \lambda_{7i}(GCF_{t-1}) + \lambda_{8i}(INTR_{t-1})$$

$$\sum_{t=1}^{p}\beta_{3i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{4i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{5i}D(Y_{t-1}) + \sum_{t=1}^{q}\beta_{6i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{7i}D(GCF_{t-1}) \qquad 9$$

$$+\sum_{t=1}^{q}\beta_{8i}D(INTR_{t-1}) + \varepsilon_{3i}$$

$$D(NBPA_{it}) = \beta_{04} + \lambda_{4i}(Y_{t-1}) + \lambda_{5i}(DDE_{t-1}) + \lambda_{6i}(DCE_{t-1}) + \lambda_{7i}(NBPA_{t-1}) + \lambda_{8i}(GCF_{t-1}) + \lambda_{9i}(INTR_{t-1})$$

$$\sum_{t=1}^{p}\beta_{4i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{5i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{6i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{7i}D(Y_{t-1}) + \sum_{t=1}^{q}\beta_{8i}D(GCF_{t-1}) \qquad 10$$

$$+\sum_{t=1}^{q}\beta_{9i}D(INTR_{t-1}) + \varepsilon_{4i}$$

$$D(GCF_{it}) = \beta_{05} + \lambda_{5i}(Y_{t-1}) + \lambda_{6i}(DDE_{t-1}) + \lambda_{7i}(DCE_{t-1}) + \lambda_{8i}(NBPA_{t-1}) + \lambda_{9i}(GCF_{t-1}) + \lambda_{10i}(INTR_{t-1})$$

$$\sum_{t=1}^{p}\beta_{5i}D(GCF_{t-1}) + \sum_{t=1}^{q}\beta_{6i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{7i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{8i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{9i}D(Y_{t-1}) \qquad 11$$

$$+\sum_{t=1}^{q}\beta_{10i}D(INTR_{t-1}) + \varepsilon_{5i}$$

$$D(INTR_{it}) = \beta_{06} + \lambda_{6i}(Y_{t-1}) + \lambda_{7i}(DDE_{t-1}) + \lambda_{8i}(DCE_{t-1}) + \lambda_{9i}(NBPA_{t-1}) + \lambda_{10i}(GCF_{t-1}) + \lambda_{11i}(Y_{t-1})$$

$$\sum_{t=1}^{p}\beta_{6i}D(INTR_{t-1}) + \sum_{t=1}^{q}\beta_{7i}D(DDE_{t-1}) + \sum_{t=1}^{q}\beta_{8i}D(DCE_{t-1}) + \sum_{t=1}^{q}\beta_{9i}D(NBPA_{t-1}) + \sum_{t=1}^{q}\beta_{10i}D(GCF_{t-1}) \qquad 12$$

$$+\sum_{t=1}^{q}\beta_{11i}D(Y_{t-1}) + \varepsilon_{5i}$$

The ARDL bounds test is based principally on the combined F-statistic which its asymptotic distribution is non-standard under the null hypothesis of no cointegration. The basic step in the

ARDL bounds approach is to estimate the six equations (1, 2, 3, 4, 5 & 6) by ordinary least squares (OLS).

Consequent upon earlier works by Pesaran and Shin (1999) and Perasan et al (2001), the short run dynamic parameters is arrived at by the estimation of an error correction model linked with the long-run estimates. The model where the null hypothesis of no cointegration is rejected is derived with an error-correction term. Hence the vector error correction model is therefore stated thus:

$$D(Y_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DCE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(NBPA_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(GCF_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(INTR_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{ii} \qquad 13$$

$$D(DDE_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DCE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(NBPA_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(GCF_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(INTR_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{it} \qquad 14$$

$$D(DCE_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(DCE_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(NBPA_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(GCF_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(INTR_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{it} \qquad 15$$

$$D(NBPA_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(NBPA_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(DCE_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(GCF_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(INTR_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{it} \qquad 16$$

$$D(GCF_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(GCF_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(DCE_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(NBPA_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(INTR_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{it} \qquad 17$$

$$D(INTR_{it}) = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} D(INTR_{it-1}) + \sum_{t=1}^{q} \lambda_{2i} D(Y_{it-1}) + \sum_{t=1}^{q} \lambda_{3i} D(DDE_{it-1}) + \sum_{t=1}^{q} \lambda_{4i} D(DCE_{it-1}) +$$

$$\sum_{t=1}^{q} \lambda_{5i} D(NBPA_{it-1}) + \sum_{t=1}^{q} \lambda_{6i} D(GCF_{it-1}) + \lambda ECT_{it-1} + \varepsilon_{it} \qquad 18$$

Where: $\lambda_{1i,}\lambda_{2i,}\lambda_{3i,}\lambda_{4i,}\lambda_{5i,}$ & $\lambda_{6i,}$ are the short-run dynamic coefficients of the model's convergence to equilibrium and β is the speed of adjustment

iv. Results

Table 1. Descriptive statistics

Statistic	UNPR (%)	POVR (%)	INFR (%)	INTR (%)	DDE/GDP	DCE/GDP	NBPA/100000	GCF/GDP
Mean	8.017692	57.18205	19.12103	22.10718	3331.829	9.210077	3.146410	36.36513
Median	6.870000	58.11000	12.22000	21.55000	385.1900	8.169000	1.890000	34.11000
Maximum	27.10000	88.00000	72.84000	36.09000	17040.72	19.62600	6.560000	89.38000
Minimum	3.500000	32.00000	5.380000	10.00000	6.560000	4.958000	1.230000	14.90000
Std. Dev.	4.893495	14.58604	17.07432	6.183622	5030.569	3.556115	1.875377	19.06441
Skewness	2.605203	0.181041	1.784043	-0.064411	1.370275	1.194680	0.576982	1.057202
Kurtosis	9.466660	1.908294	4.996617	2.694020	3.515372	3.999963	1.741735	3.822555
Jarque-Bera	112.0698	2.149753	27.16630	0.179105	12.63636	10.90208	4.736654	8.364368
Probability	0.000000	0.341340	0.000001	0.914340	0.001803	0.004292	0.093637	0.015265
Sum	312.6900	2230.100	745.7200	862.1800	129941.3	359.1930	122.7100	1418.240
SumSq. Dev.	909.9591	8084.600	11078.23	1453.013	9.62E+08	480.5462	133.6475	13811.16
Observations	39	39	39	39	39	39	39	39

Source (computedresultEViews12)

The descriptive result reported in table 1 indicates that there is a serious disparities and instabilities in both macroeconomic aggregates and financial inclusion in Nigeria over the period under consideration. These are evidenced in the standard deviation, minimum and maximum values of unemployment rate, poverty rate, price level, interest rate on credit, ratio of domestic deposit to economic growth, ratio of domestic credit by deposit money banks to GDP, number of deposit money banks branches per 100,000 adults and gross capital formation percentage of GDP. The implication of this result is that the Nigerian economy had witnessed very high level of instability both in growth performance, job creation, poverty alleviation, stable prices and financial sector development.

Table 2: Unit Root Test Result at Level and first Difference using Philip Perron (PP)

Variable	PP Statistic	1%	5%	10%	Decision
UNPR	5.631	-3.616	-2.941	-2.609	Stationary@ level
POVR	-5.924	-3.621	-2.943	-2.610	Stationary@ 1st difference
INFR	-9.691	-3.621	-2.943	-2.610	Stationary@ 1st difference
INTR	-8.507	-3.621	-2.943	-2.610	Stationary@1st difference
DDE	5.220	-3.616	-2.941	-2.609	Stationary@ level
DCE	-7.319	-3.621	-2.943	-2.610	Stationary@ 1st difference
NBPA	-5.590	-3.621	-2.943	-2.610	Stationary@ 1st difference
GCF	-3.568	-3.616	-2.941	-2.609	Stationary@ level

Source (computed result EViews 12)

The unit roots test results reported in table 2 indicate mix order of stationarity among the variables under investigation. For instance unemployment rate, deposit penetration, and ratio of domestic investment to GDP were stationary at level {i(0)} while poverty rate, inflation rate, interest rate, credit penetration and bank branch penetration were stationary at first difference {i(1)}. This mix order of stationarity informed the choice of ARDL technique for our analysis. To check for long run relationship among the variable, the ARDL bound test was carried out. The result is presented in table 3 below:

Table 3: Bound test Result for Unemployment model

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Critical values	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.266371	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Actual Sample Size	35		Finite Sample: n=35	
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419

Source (computed result EViews 12)

The autoregressive and distributed lag (ARDL) bound test for long run dynamics reported in table 3 shows that long run equilibrium exists between the dependent and independent variables given the F-statistic of 7.266371 and the critical values at 1%, 5% and 10% respectively. Given this result, we reject the null hypothesis that; No levels relationship exists among the variables in the unemployment model. The confirmation of long run relationship is a pre-condition for estimating the long run coefficients and error correction model (ECM) for the unemployment equation.

Table 4(a): ARDL long run result for Unemployment Model. Selected model: ARDL (3,4,4,4,2,1)

Variable	Coefficient	t-Statistic	Prob.
C	-15.83987	-2.883121	0.0149
UNPR(-1)*	-0.143173	-0.422646	0.6807
DDE(-1)	0.001793	5.242151	0.0003
DCE(-1)	1.488459	4.071502	0.0018
NBPA(-1)	-2.167039	-2.787297	0.0177
GCF(-1)	0.181085	3.662723	0.0037
INTR(-1)	0.075846	1.029681	0.3253
D(UNPR(-1))	-0.865205	-2.134009	0.0562
D(UNPR(-2))	-0.514996	-1.370199	0.1979
D(DDE)	-0.000437	-0.649787	0.5292
D(DDE(-1))	-0.002823	-4.146545	0.0016
D(DDE(-2))	-0.002770	-3.816901	0.0029
D(DDE(-3))	-0.001449	-2.333292	0.0396
D(DCE)	0.589013	3.030888	0.0114
D(DCE(-1))	-0.580377	-2.470966	0.0311
D(DCE(-2))	-0.835135	-3.562815	0.0045
D(DCE(-3))	-0.396048	-1.777014	0.1032
D(NBPA)	-0.027258	-0.068393	0.9467
D(NBPA(-1))	2.331436	3.345097	0.0065
D(NBPA(-2))	2.778236	3.942448	0.0023
D(NBPA(-3))	1.794128	2.718036	0.0200
D(GCF)	-0.105745	-1.364660	0.1996
D(GCF(-1))	-0.185156	-1.947313	0.0775
D(INTR)	0.012724	0.208584	0.8386

Source (computed result EViews 12)

Table 4(b): Long run coefficients with restricted constant and no trend for Unemployment rate model.

Variable	Coefficient	t-Statistic	Prob.
DDE	0.012521	0.444638	0.6652
DCE	10.39625	0.426367	0.6781
NBPA	-15.13583	-0.451833	0.6602
GCF	1.264800	0.417389	0.6844
INTR	0.529751	0.323952	0.7521
C	-110.6347	-0.384707	0.7078

Source (computed result EViews 12)

The summary of long run result of the unemployment model reported in tables 4(a &b) show that ratio of deposit money banks' deposit to GDP is positively and insignificantly related to unemployment level. This implies that increase in the ratio of DMBs deposit to GDP increased unemployment and vice versa. This result deviates from theoretical expectation and economic theory and corroborates earlier studies by Arcand et al (2013), Crepon et al (2014), Grimm and Paffhausen (2015) and Stewart and Dewet (2012) which reported negative relationship between

access to financial services and job creation. An increase in domestic deposit to GDP is a measure of financial liquidity in an economy. This shows the extent to which loanable funds by deposit money banks are available to both the private and public sectors borrowing. Hence an increase in domestic deposit makes lending rate to fall due to high level of liquidity or supply of loanable fund, hence stimulate investment, economic activities and help create additional jobs.

Ratio of domestic credit to the private sector by DMBs to GDP also has positive coefficient with unemployment level. It is also insignificant at 5 percent level. This implies that domestic credit by DMBs had not stimulated employment in Nigeria thus deviated from the apriori theoretical expectation and economic theory but agrees with earlier studies Arcand et al (2013), Crepon et al (2014), Grimm and Paffhausen (2015) and Stewart and Dewet (2012) which reported negative relationship between access to financial services and job creation. An increase in domestic credit to GDP is a measure of financial penetration in an economy. This shows the extent to which loanable funds by deposit money banks to the private sector have improve the performance of an economy. Theoretically, an increase in domestic credit to the private, stimulate investment, economic activities and create additional jobs.

Ratio of domestic investment to GDP deviated from theoretical expectation and theory with positive coefficient. It is also insignificant at 5 percent level. This implies that increase in domestic investment spurred unemployment in Nigeria over the period of this study. This result is in tandem with earlier studies by Arcand et al (2013), Crepon et al (2014), Grimm and Paffhausen (2015) and Stewart and Dewart (2012) which reported negative relationship between access to financial services and job creation. Usually, increase in domestic investment stimulate production and general economic activities hence create employment in an economy.

Deposit money banks' branch penetration bears a negative coefficient but insignificant at 5 percent level. This indicates that increase in DMBs branches per 100,000 adults/ spreads of banks' branches create jobs thus reduced unemployment over the period under investigation. This result is in tandem with the theoretical expectation and agrees with previous studies by Kondo (2007) and Dunn and Arbuckle (2001) which reported negative relationship between access and usage of financial services and unemployment rate. Increase in number of banks' branches per group of adult citizens makes financial service accessible and available to the unbanked public thereby encourage entrepreneurship, investment and employment. Interest rate conforms to theoretical expectation with a positive coefficient though it is not significant at 5 percent level. This implies that increase in cost of funds spurred unemployment and vice versa. Increase in cost of loanable funds raises cost of production and stifle investment and employment in an economy.

Table 5: Error Correction Model Result for Unemployment model with Selected Model: ARDL (3, 4, 4, 4, 2, 1)

Variable	Coefficient	t-Statistic	Prob.
D(UNPR(-1))	-0.865205	-4.955400	0.0004
D(UNPR(-2))	-0.514996	-2.603341	0.0245
D(DDE)	-0.000437	-1.354056	0.2029
D(DDE(-1))	-0.002823	-6.971444	0.0000
D(DDE(-2))	-0.002770	-5.739738	0.0001
D(DDE(-3))	-0.001449	-4.068598	0.0019
D(DCE)	0.589013	5.320001	0.0002
D(DCE(-1))	-0.580377	-4.739832	0.0006
D(DCE(-2))	-0.835135	-7.011586	0.0000
D(DCE(-3))	-0.396048	-3.407820	0.0058
D(NBPA)	-0.027258	-0.102829	0.9199
D(NBPA(-1))	2.331436	6.462938	0.0000
D(NBPA(-2))	2.778236	6.483652	0.0000
D(NBPA(-3))	1.794128	4.551976	0.0008
D(GCF)	-0.105745	-2.044820	0.0656
D(GCF(-1))	-0.185156	-3.535075	0.0047
D(INTR)	0.012724	0.385582	0.7072
CointEq(-1)*	-0.143173	-8.866167	0.0000
$R^2 = 0.92$; R^2 - adjusted = 0.83; Durbin -Watson Stat = 2.53; AIC = 2.5; SC = 3.3			

Source (computed result EViews 12)

The ARDL error correction model (ECM) result reported in table 5 indicates that ratio of domestic deposit to GDP has negative relationship with unemployment rate at level, lags 1, 2 & 3. It is also significant at 5 percent level. This implies that ratio of domestic deposit to GDP significantly retarded unemployment hence created jobs in Nigeria during the period of this study. This result is in tandem with theoretical expectation and theory and agrees with previous studies by Kondo (2007) and Dunn and Arbuckle (2001) which reported negative relationship between access and usage of financial services and unemployment rate. Increase in domestic deposit increase money supply and level of liquidity hence reduce interest rate on loanable funds for investment which help to stimulate production, economic growth and job creation.

Credit penetration has positive relationship with unemployment at level but has negative sign with unemployment rate at lags 1, 2 & 3. It is significant at level and the lags coefficients. This implies that ratio of domestic private credit to GDP has significant retarding effect on unemployment in Nigeria over the period. Increase in domestic private sector credit promotes investments hence help stimulate economic activities and reduce unemployment. This result also conforms with previous studies by Kondo (2007) and Dunn and Arbuckle (2001) which reported negative relationship between access and usage of financial services and unemployment rate.

Bank penetration has negative relationship with unemployment rate at level but insignificant at level hence agrees with previous studies by Kondo (2007) and Dunn and Arbuckle (2001) which

reported negative relationship between access and usage of financial services and unemployment rate. However, it is positively and significantly related to unemployment at lags 1, 2 & 3 which deviated from theoretical expectation. This implies that number of DMBs branches per 100,000 adults has significant positive implication on unemployment hence spurred joblessness during the period of this study which corroborates earlier studies by Arcand et al (2013), Crepon et al (2014), Grimm and Paffhausen (2015) and Stewart and Dewart (2012) which reported negative relationship between access to financial services and job creation. Nigeria still have very high level of unbanked public due to non-availability of DMBs branches in most rural communities. The absence of formal banking institution in the rural communities makes access to financial services difficult and expensive. This hamper entrepreneurship, investment and job creation in the rural areas.

Ratio of domestic investment to GDP has negative nexus with unemployment at level and lag 1. It is also significant at 5 percent level. This implies that domestic private investment has very strong negative implication on unemployment hence friendly with job creation. This variable conforms with theoretical expectation and economic theory and conforms with previous studies by Kondo (2007) and Dunn and Arbuckle (2001) which reported negative relationship between access and usage of financial services and unemployment rate. Increase in domestic private investments is a pre-condition for increase economic activities and job creation. Though the domestic investment to GDP stood at 36.4 percent on an average over the period, any marginal rise in private domestic investment reduces unemployment by creating additional jobs in the economy.

Interest rate with a positive nexus with unemployment is in tandem with theoretical expectation and economic theory. Though insignificant at 5 percent level, the result suggests that the high cost of loanable fund is one of the principal causes of unemployment in Nigeria. Interest rate on loanable fund over the period of this stood at an average of 22.1 percent. This high and unhealthy for investment, production and job creation in Nigeria. The negative coefficient of the speed of adjustment of the error correction model indicates that the variables in the unemployment equation adjust speedily to changes in long run dynamics/equilibrium. The coefficient of determination indicates that 92 percent of the systematic variation in unemployment is influenced by financial inclusion and domestic investment in Nigeria over the period under study.

Table 6: Model Diagnostic test for Unemployment model

Diagnostic test	F-statistic	Probability
Jarque-Bera test for normality	0.271	0.873
Breusch-Godfrey serial correlation LM test	0.841	0.463
Breusch -Pagan Godfrey Heteroskedasticity test	0.718	0.758
Ramsey RESET test for specification error	2.732	0.129

Source (computed result EViews)

The results of the diagnostics test on the residual as reported in table 6 reveal that the error term is normally distributed around the mean as the null hypothesis is accepted. It also shows no evidence of autocorrelation given the serial correlation LM test value of 0.841 and a probability value of 0.463 hence the acceptance of null hypothesis (Ljung & Box, 1978). Furthermore, the test for heteroscedasticity revealed that it is absent in the model as we accept the null hypothesis of homoscedasticity (Engle, 1982; & Jarque and Bera, 1980). The Ramsey RESET test indicated that no variable is missing in the model as the null hypothesis is also accepted. The adherence of the model to the basic assumptions of ordinary least squares estimation affirm that the model is good for prediction and forecast hence the best linear estimator (the BLUE)

Table 7: Bound test Result for Poverty rate model

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.229415	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Actual Sample Size	35		Finite Sample: n=35	
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419

Source (computed result EViews 12)

The autoregressive and distributed lag (ARDL) bound test for long run dynamics reported in table 7 shows that long run equilibrium exists between the dependent (poverty rate) and independent variables (financial inclusion) given the F-statistic of 4.229415 and the critical values at 1%, 5% and 10% respectively. Given this result, we reject the null hypothesis that; no levels relationship exists among the variables in the poverty model. The confirmation of long run relationship is a pre-condition for estimating the long run coefficients and error correction model (ECM) for the poverty equation.

Table 8(a): ARDL long run result for Poverty model - Selected Model: ARDL (1, 4, 3, 1, 0, 3)

Variable	Coefficient	t-Statistic	Prob.
C	19.21064	0.803718	0.4327
POVR(-1)*	-0.485958	-3.540876	0.0025
DDE(-1)	-0.001961	-2.969408	0.0086
DCE(-1)	5.147149	4.117055	0.0007
NBPA(-1)	-5.081147	-2.357818	0.0306
GCF**	-0.430253	-1.460923	0.1623
INTR(-1)	0.068800	0.251596	0.8044
D(DDE)	-0.005370	-2.820786	0.0118
D(DDE(-1))	0.003752	1.705589	0.1063
D(DDE(-2))	-4.31E-05	-0.018782	0.9852
D(DDE(-3))	-0.005709	-2.711797	0.0148
D(DCE)	3.170758	4.597742	0.0003
D(DCE(-1))	-2.224065	-3.039746	0.0074
D(DCE(-2))	-2.369790	-2.879776	0.0104
D(NBPA)	-9.833566	-5.412355	0.0000
D(INTR)	-0.165112	-0.716741	0.4833
D(INTR(-1))	-0.220295	-0.852710	0.4057
D(INTR(-2))	-0.442707	-1.872702	0.0784

Source (computed result EViews 12)

Table 8(b): Long run coefficient with restricted constant and no trend for Poverty rate Model.

Variable	Coefficient	t-Statistic	Prob.
DDE	-0.004036	-4.112563	0.0007
DCE	10.59175	3.624264	0.0021
NBPA	-10.45593	-3.069529	0.0069
GCF	-0.885370	-1.975081	0.0647
INTR	0.141576	0.245180	0.8093
C	39.53147	0.945023	0.3579

Source (computed result EViews 12)

The long run result of the poverty rate model reported in tables 8(a &b) show that ratio of domestic deposit to GDP is negatively and significantly related to poverty level. This implies that increase in the ratio of domestic deposit to GDP retarded poverty and vice versa. This result conforms to theoretical apriori expectation and economic theory. This result is in agreement with earlier studies by: Honohan, (2007 & 2008); Garcial-Herrer and Turegano (2015); Jabir et al (2017) and Omar and Inaba (2020). These studies reported a negative relationship between access to financial service and poverty rate which implies that access to financial services reduce incidence of poverty.

Ratio of domestic credit to the private sector by DMBs to GDP has positive coefficient with poverty rate. However, it is also significant at 5 percent level. This implies that domestic credit

by DMBs significantly stimulated poverty in Nigeria thus deviated from the apriori theoretical expectation and economic theory. The result deviated from earlier studies by Honohan, (2007 & 2008); Garcial-Herrer and Turegano (2015); Jabir et al (2017) and Omar and Inaba (2020).

Ratio of domestic investment to GDP is in consonance with theoretical expectation and theory with a negative coefficient. It is also significant at 5 percent level. This implies that increase in domestic investment significantly retarded poverty in Nigeria over the period of this study.

Deposit money banks' branches penetration bears a negative coefficient and is significant at 5 percent level. This indicates that increase in the spreads of banks' branches reduce poverty thus significantly improve the living condition of the people in Nigeria over the period under investigation. This result is in tandem with the theoretical expectation. This result agrees with study by Park and Mercado (2018) who found that financial inclusion defined in term of spread of size on financial services did not reduced poverty in Less developed countries.

Interest rate conforms to theoretical expectation with a positive coefficient though it is not significant at 5 percent level. This implies that increase in cost of funds spurred poverty and vice versa. An increase in cost of credit will reduce access and affordability of basic necessity of living hence fuel poverty. In nutshell, all the indicators of financial inclusion except domestic credit comply with theoretical apriori expectation and are significant at 5 percent level. This implies that financial inclusion significantly reduced poverty in Nigeria over the period of this study.

Table 9: ARDL Error Correction (ECM) Result for Poverty rate model with Selected Model: ARDL (1, 4, 3, 1, 0, 3)

Variable	Coefficient	t-Statistic	Prob.
D(DDE)	-0.005370	-5.412779	0.0000
D(DDE(-1))	0.003752	3.785572	0.0015
D(DDE(-2))	-4.31E-05	-0.036822	0.9711
D(DDE(-3))	-0.005709	-4.744903	0.0002
D(DCE)	3.170758	6.758271	0.0000
D(DCE(-1))	-2.224065	-4.114806	0.0007
D(DCE(-2))	-2.369790	-3.860632	0.0013
D(NBPA)	-9.833566	-7.335728	0.0000
D(INTR)	-0.165112	-0.977775	0.3419
D(INTR(-1))	-0.220295	-1.352902	0.1938
D(INTR(-2))	-0.442707	-2.808672	0.0121
CointEq(-1)*	-0.485958	-6.328906	0.0000
$R^2 = 0.84$; R^2 - adjusted = 0.76; Durbin -Watson Stat = 2.28; AIC = 5.76; SC = 6.30			

Source (computed result EViews 12)

The ARDL error correction model (ECM) result reported in table 9 indicates that ratio of domestic deposit to GDP has negative coefficient with poverty rate at level, lags 2 & 3 but has positive coefficient at lag 2. It is also significant at 5 percent at these lags. This implies that ratio of domestic deposit to GDP significantly implication on poverty rate in Nigeria. The conformity

of domestic deposit to theoretical expectation and its significance shows that domestic deposit retarded poverty over the period of this study. Increase in domestic deposit increase money supply and level of liquidity hence reduce interest rate on loanable funds for investment which help to stimulate production, create job and reduce poverty. This result agrees with earlier studies carried out by the following scholars: Honohan, (2007 & 2008); Garcial-Herrer and Turegano (2015); Jabir et al (2017) and Omar and Inaba (2020). These studies reported a negative relationship between access to financial service and poverty rate which implies that access to financial services reduce incidence of poverty.

Ratio of domestic private sector credit to GDP has positive relationship with poverty at level but has negative relationship with poverty at lags 1 & 2. It is also significant at these lags levels. This implies that domestic private credit to GDP has significant effect on poverty rate in Nigeria over the period. Increase in domestic private sector credit promotes investments hence help stimulate economic activities, create additional jobs and reduce poverty. This result deviated from the works of: Honohan, (2007 & 2008); Garcial-Herrer and Turegano (2015); Jabir et al (2017) and Omar and Inaba (2020) at level but complies with these earlier studies at lags 1 & 2. The studies reported a negative relationship between access to financial service and poverty rate which implies that access to financial services reduce incidence of poverty.

Number of DMBs branches per 100,000 adults has negative and significant relationship with poverty rate. This result is in consonance with theoretical apriori expectation. This implies that number of DMBs branches per 100,000 adults has significant negative implication on poverty hence reduced poverty during the period of this study. The rise in deposit money bank branches after the banking sector in 2004 and the availability of DMBs branches/services in most rural communities may have accounted for this result. The formal banking institution and services in the rural communities have made access to financial services easy and cheaper. This encourages entrepreneurship, investment, job creation and help reduce poverty. Its complies with earlier studies by Honohan, (2007 & 2008); Garcial-Herrer and Turegano (2015); Jabir et al (2017) and Omar and Inaba (2020). These studies reported a negative relationship between access to financial service and poverty rate which implies that access to financial services reduce incidence of poverty. It however, deviated from the study by Park and Mercado (2018) which found that spread and size of financial services do not reduce poverty in less developed countries.

Interest rate with negative relationship with poverty at level and all the lags levels. This is in tandem with theoretical expectation and economic theory. Though insignificant at 5 percent level, the result suggests that interest rate on loanable fund has less implication on poverty rate in Nigeria. Interest rate on loanable fund over the period of this stood at an average of 22.1 percent. This high and unhealthy for investment, production, job creation and poverty reduction in Nigeria.

The negative coefficient of the speed of adjustment of the error correction model indicates that the variables in the poverty equation adjust speedily to changes in long run dynamics/equilibrium.

The coefficient of determination indicates that 84 percent of the systematic variation in poverty rate is influenced by financial inclusion and domestic investment in Nigeria over the period under study.

Table 10: Model Diagnostic test for Poverty rate

Diagnostic test	F-statistic	Probability
Jarque-Bera test for normality	8.845	0.012
Breusch-Godfrey serial correlation LM test	1.000	0.390
Breusch -Pagan Godfrey Heteroskedasticity test	0.966	0.528
Ramsey RESET test for specification error	0.275	0.607

Source (computed result EViews 12)

The results of the diagnostics tests on the residual as reported in table 10 reveal that the error term is not normally distributed around the mean as the null hypothesis is rejected (Engle, 1982;& Jarque and Bera, 1980). The result however shows no evidence of autocorrelation given the serial correlation LM test value of 1.00 and a probability value of 0.39 hence the acceptance of null hypothesis (Ljung & Box, 1978). Furthermore, the test for heteroscedasticity revealed that it is absent in the model as we accept the null hypothesis of the presence of homoscedasticity. The Ramsey RESET test indicated that no variable is missing in the model as the null hypothesis is also accepted given the probability value of 0.607. The adherence of the model to the basic assumptions of ordinary least squares estimation affirms that the model is good for prediction and forecast hence the best linear estimator (the BLUE)

Table 11: ARDL Bound test result for inflation rate model - Selected Model: (2, 0, 0, 1, 4, 4)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.457049	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Actual Sample Size	35		Finite Sample: n=35	
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419

Source (computed result EViews 12)

The autoregressive and distributed lag (ARDL) bound test for long run dynamics reported in table 11 shows that long run equilibrium exists between the dependent (inflation rate) and independent variables (financial inclusion) given the F-statistic of 3.457049 and the critical

values at 5% and 10% respectively. Given this result, we reject the null hypothesis that; no levels relationship exists among the variables in the inflation rate model. The verification of long run relationship is a pre-condition for estimating the long run coefficients and error correction model (ECM) for the inflation rate equation. The long run result is presented in table 12

Table 12 (a): ARDL Long run result for Inflation rate model -selected model:(2, 0, 0, 1, 4, 4)

Variable	Coefficient	t-Statistic	Prob.
C	-90.19766	-2.190840	0.0419
INFR(-1)*	-0.644061	-3.799512	0.0013
DDE**	-0.000721	-1.024861	0.3190
DCE**	1.323951	1.433341	0.1689
NBPA(-1)	2.177263	0.704607	0.4901
GCF(-1)	0.891039	1.668403	0.1125
INTR(-1)	2.418190	2.582098	0.0188
D(INFR(-1))	0.586823	3.393863	0.0032
D(NBPA)	-3.613238	-0.959715	0.3499
D(GCF)	0.282755	0.488554	0.6311
D(GCF(-1))	-1.226675	-2.567350	0.0194
D(GCF(-2))	1.262762	2.895870	0.0096
D(GCF(-3))	-1.708170	-3.228259	0.0047
D(INTR)	1.024518	1.638467	0.1187
D(INTR(-1))	-2.038814	-2.475565	0.0235
D(INTR(-2))	0.188835	0.274550	0.7868
D(INTR(-3))	-0.689666	-1.169665	0.2574

Source (computed result EViews 12)

Table 12(b): Long run coefficients with restricted constant and no trend for Inflation rate model.

Variable	Coefficient	t-Statistic	Prob.
DDE	-0.001120	-0.988442	0.3360
DCE	2.055629	1.248446	0.2279
NBPA	3.380522	0.744368	0.4663
GCF	1.383469	1.933723	0.0690
INTR	3.754596	2.853112	0.0106
C	-140.0452	-2.349018	0.0304

Source (computed result EViews 12)

The summary of long run result of the inflation rate model reported in tables 12(a &b) show that ratio of domestic deposit to GDP is negatively and insignificantly related to inflation level. This implies that increase in the ratio of domestic deposit to GDP retarded price level and vice versa. This result is in consonance with theoretical expectation and economic theory and also in tandem with earlier studies by El Sherif (2019) and Nbutor and Uba (2013 & 2014) which found negative nexus between financial inclusion and inflation rate. Increase in domestic deposit to GDP reduce interest rate on loanable fund, stimulate investments and production hence curb inflation at least in the short run.

Ratio of domestic credit to the private sector by DMBs to GDP has positive relationship with price level. It is also insignificant at 5 percent level. This implies that domestic credit by DMBs fuels inflation in Nigeria thus deviated from the apriori theoretical expectation and economic theory and agreed with earlier study by Mehrotra and Yetman (2014) which found positive relationship between financial inclusion and inflation rate. Increase in domestic private credit spur investment, production and stabilises price.

Ratio of domestic investment to GDP deviated from theoretical expectation and theory with positive coefficient. It is also insignificant at 5 percent level. This implies that increase in domestic investment spurred inflation rate in Nigeria over the period of this study. This corroborates earlier study by Mehrotra and Yetman (2014) which found positive relationship between financial inclusion and inflation rate. An increase in domestic to GDP stimulate production, output and stabilises price level.

Deposit money banks' penetration has a positive and insignificant relationship with inflation rate at 5 percent level. This indicates that increase in DMBs branches per 100,000 adults/ spreads of banks' branches fuels inflation over the period under investigation. This result deviated from the theoretical expectation. This conformed earlier study by Mehrotra and Yetman (2014) which found positive relationship between financial inclusion and inflation rate. Increase in ratio of bank branches makes financial services accessible and affordable to the banking public hence stimulate investment, production and stabilises price.

Interest rate conforms to theoretical expectation with a positive and significant relationship with inflation rate at 5 percent level. This implies that increase in cost of funds spurred price level and vice versa. High cost of loanable funds stifle investment, retards production and fuels inflation.

Table 13: ARDL Error Correction (ECM) Result for inflation rate model selected model: ARDL (2, 0, 0, 1, 4, 4)

Variable	Coefficient	t-Statistic	Prob.
D(INFR(-1))	0.586823	4.438380	0.0003
D(NBPA)	-3.613238	-1.390819	0.1812
D(GCF)	0.282755	0.673704	0.5091
D(GCF(-1))	-1.226675	-3.820986	0.0013
D(GCF(-2))	1.262762	3.576798	0.0022
D(GCF(-3))	-1.708170	-4.517597	0.0003
D(INTR)	1.024518	2.704607	0.0145
D(INTR(-1))	-2.038814	-3.968554	0.0009
D(INTR(-2))	0.188835	0.451152	0.6573
D(INTR(-3))	-0.689666	-1.683611	0.1095
CointEq(-1)*	-0.644061	-5.680298	0.0000
$R^2 = 0.79$; R^2 - adjusted = 0.70; Durbin -Watson Stat = 2.53; AIC = 7.35; SC = 7.84			

Source (computed result EViews 12)

The ARDL error correction model result for inflation rate reported in table 13 shows that ratio of DMBs penetration is negatively and insignificantly related to general price level. This result is in

consonance with theoretical expectation and its implies that increases in banks' branches reduces inflation rate hence stabilises price and vice versa. Increases in banks' branches bring financial service to the doors of the banking public hence makes financial services easy and accessible to savers and investors. This promotes investment, production and stabilises price. However, the insignificance of this variable reveals that banks' branches is inadequate to enhance price stability in Nigeria over the period under investigation. The result is in tandem with earlier studies by El Sherif (2019) and Nbutor and Uba (2013 & 2014) which found negative nexus between financial inclusion and inflation rate.

Ratio of domestic investment to GDP has both negative and positive relationship with inflation rate. It is positively related to price level at level and lag 2 but negatively related to price level at lag 1 & 3. Ratio of domestic investment to GDP is significant at the lags level. This implies that domestic investment (capital formation) has serious but unstable implication on price stability in Nigeria over the period of this study. Increase in domestic investment stimulate production and stabilise prices.

Interest rate on loanable fund also has both positive and negative relation with inflation rate. It is positively related to price level at level and lag 2 but negatively related to price level at lag 1 & 3. Interest rate is significant at level and lag 1 but insignificant at lags 2 & 3. This implies that interest rate on loanable funds has serious but unstable implication on price stability in Nigeria over the period of this study. Increase in cost of loanable fund raises cost of production and price level.

The negative coefficient of the error correction model and its significance at 5 percent shows that the variables in the inflation rate model adjust speedily to changes in price level in Nigeria over the period of this study. Also the goodness of fit of 0.79 reveals that about 79 percent of the systematic variation in price level is accounted for by changes in financial inclusion.

Table 14: Model Diagnostic test for Inflation rate model

Diagnostic test	F-statistic	Probability
Jarque-Bera test for normality	1.168	0.558
Breusch-Godfrey serial correlation LM test	3.108	0.072
Breusch -Pagan Godfrey Heteroskedasticity test	0.464	0.936
Ramsey RESET test for specification error	20.17	0.003

Source (computed result EViews 12)

The results of the residual diagnostics tests reported in table 14 show that the error term is normally distributed around the mean as the null hypothesis is accepted (Engle, 1982;& Jarque and Bera, 1980). The result also shows no evidence of autocorrelation given the serial correlation LM test value of 3.108 and a probability value of 0.072 hence the acceptance of null hypothesis (Ljung & Box, 1978). Furthermore, the test for heteroscedasticity revealed that it is absent in the

model as we accept the null hypothesis of the presence of homoscedasticity. The Ramsey RESET test indicated that there is a missing variable in the model as the null hypothesis is not accepted given the probability value of 0.003. The adherence of the model to the basic assumptions of ordinary least squares estimation affirms that the model is good for prediction and forecast hence the best linear estimator (the BLUE)

v. Discussion of Findings

Credit and deposit penetrations (ratios of credit and domestic deposit to GDP) and domestic investment as a percentage of GDP were positively related to unemployment rate hence spurred unemployment in the long run. However, the variables were negatively related to unemployment in the short run error correction model. This implies that financial inclusion stimulated joblessness in the long run but retarded joblessness in the short run. The long run result is in tandem with earlier studies and findings by Arcand et al (2013), Crepon et al (2014), Grimm and Paffhausen (2015) and Stewart and Dewet (2012) which reported positive relationship between financial inclusion and unemployment. However, the short run error correction model result corroborates earlier studies by Kondo (2007) and Dunn and Arbuckle (2001) which reported negative relationship between financial inclusion and unemployment rate.

Empirical evidence from Nigeria shows that though the proportion of adult population who access and uses financial services have increased since 2004 after the banking sector reform, the rural communities in the countries are still with no access to modern financial services. With about 70 percentage of the Nigerian population in the rural areas, it implies that these communities are bound to have low savings, investments and high level of unemployment. The high level of poverty, insecurity and dearth of basic infrastructure been experienced in the country over the years may have accounted for the positive impact of credit and deposit penetration and domestic investments on unemployment in the long run. However, the introduction of modern financial services like: Automated Teller Machine (ATM), Point of sales (POS) and mobile banking applications may have accounted for the negative impact of financial inclusion on unemployment in the short run.

The proportion of banks' branches per 100,000 adults was negatively related to unemployment in the long run but positively linked to unemployment rate in the short run. This implies that banks branches penetration retarded unemployment in the long run but spurred joblessness in the short run. Increase in branch network of banks enhance easy access and usage of financial services which stimulate investment and create jobs. Though the number of bank branches per 100,000 adults had increased since 2004, the number is ratio is still small to achieve the set target of financial inclusion in Nigeria.

The insignificance of all the financial inclusion variables in the long run implies that it has less implication on unemployment in the long run. However, the financial inclusion variables were significant in the short run error correction model which indicate that financial inclusion significantly affected unemployment in the short run.

The impact of financial inclusion on poverty rate shows that deposit penetration, banks branches per 100,000 adults and proportion of domestic investment to GDP all have negative and

significant relationship with poverty level in the long run. This implies that in the long run, these variables significantly retarded poverty over the period under investigation. This results are in agreement with earlier studies by Honohan (2007 & 2008), Garcial-Herrer and Turegano (2015), Jarbir et al (2017), Park and Mercado (2018) and Omar and Inaba (2020). Credit penetration and interest rate deviated from theoretical expectation with positive coefficients. This implies that increase in credit penetration and interest rate spurred poverty in the long run. Most scholars attributed the high level of poverty in Nigeria to high level of interest rate on loanable fund and fall in credit penetration.

In the short run error correction model, deposit penetration, credit penetration, number of banks' branches per 100,000 adults and interest rate were all negatively and significantly related to poverty rate in Nigeria. These results imply that financial inclusion retarded poverty significantly in the short run. These results also agree with earlier studies by: by Honohan (2007 & 2008), Garcial-Herrer and Turegano (2015), Jarbir et al (2017), Park and Mercado (2018) and Omar and Inaba (2020) which reported negative link between financial inclusion and poverty level. It should be noted after the banking sector reform in 2004, the sector had witnessed serious innovations. These innovations ranges from increase in bank branches, turnaround time to Information and communication services. Most banking services are now automated and even loan could be accessed through mobile network. These appears to have increased people's access to modern financial services which may help to reduce poverty. However, this depends on the earning and income capacity of the banking public.

Deposit penetration has negative and significant effect on inflation rate in the long run. This implies that ratio of deposit to GDP retarded inflation hence stabilises price level. This result is in agreement with earlier studies by El Sherif (2019) and Nbutor and Uba (2013 & 2014). They found that financial inclusion via deposit penetration stabilised price level. However, in the long run also, ratio of domestic credit to GDP, DMB penetration, domestic investment as percentage of GDP and interest rate were positively but insignificantly related to inflation rate. This implies that these variable fuel inflation rate. This result agrees with earlier studies carried out by Mehrotra and Yetman (2014) which found that increase in financial inclusion sometimes increase price level and reduced people's welfare.

Financial services are like a double-edged sword and fire. It can improve investment, production, create jobs and reduce poverty if properly managed but could also hamper investment, reduced job creation and increase poverty if not properly managed. Production and consumption react speedily to changes in price level, level of liquidity, interest rate amongst others. The poor management of the financial sector which had cumulated into high interest rate, high exchange rate of the naira to other foreign currencies among others may have accounted for these results over the period of this study.

The short run error correction model result of the inflation rate model indicates that DMB penetration was negatively and insignificantly related to inflation rate. This implies that banks' branches spread help stabilised price level over the period of this study. However, domestic investment as a percentage of GDP and interest rate have mixed results with negative and positive coefficients. These imply that domestic investment and interest had both retarding and

spurring effects on price level. The instability witnessed in the financial sector which partly cumulated into an unstable macroeconomic environment may have accounted for this results.

The high speed of adjustments of the error corrections mechanisms reported in all the models (unemployment, poverty and inflation) show that these macroeconomic variables adjust speedily to changes in financial inclusion proxy by deposit penetration, credit penetration, banks' branches penetration, domestic investment as a percentage of GDP and interest rate in Nigeria. Also the high coefficient of determination of: 92%, 84% and 79% respectively reported for the unemployment, poverty and inflation rate models show that financial inclusion variables accounted for very high systematic variation in the selected macroeconomic variables under study.

The post estimation test shows that all the variables and their residuals conform to the basic assumptions of ordinary least squares estimation and thus good for prediction and forecast.

Vii. Concluding Remarks

This paper examined the impact of financial inclusion on unemployment rate, poverty level and inflation rate using the ARDL methodology. Based on the results and findings as outlined above, the study concludes that: financial inclusion has less implication on unemployment in the long run but has negative and significant impact on unemployment in the short run. Financial inclusion has negative and significant implications on poverty both in the short and long run over the period of this study. Financial inclusion was inconsistent in explaining changes in inflation rate both in the short and long run in Nigeria over the period of this study. Credit penetration and banks' branches penetration fuel inflation. Only deposit penetration retarded inflation in the long run. Based on this findings, the paper recommends: increase in deposit mobilisation through savings, domestic credit and banks' branches to create jobs and reduce poverty and selected allocation of credit to the real sector to curb inflation in Nigeria.

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