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Financial Deepening and Sustainable Development Goal in Nigeria (1982-2016)

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Abstract:
This paper examined the impact of financial deepening in achieving sustainable development goal in Nigeria. The study relied on secondary time series annual data and analyzed the collected data by using inferential statistics. The methods of analysis or estimation techniques included Augmented Dickey-Fuller (ADF) Unit Root test, and Autoregressive Distributed Lags (ARDL) model. The finding of this study thus points to the fact that the bulk of the money supply has been left fallow instead of using them for productive purpose, obviously, the credit providers are holding on to their money for fear of inherent and probable bad and irrecoverable debts associated with lending activities. It was also revealed that there was an existence of both short run and long run relationships among the variables of interest. In the light of the forgoing findings, it was concluded that the behaviours of financial deepening from time to time caused a significant change on the growth of Nigerian economy. Consequently, it was recommended that the monetary authorities should ensure optimal money supply while monitoring to ensure that the bulk of the money supply is put into productive use rather than left idle, as this will bring about positive relationship between money supply and economic growth.

Keywords: Financial deepening, sustainable economic development, autoregressive distributed lag

1. Introduction

Sustainable development refers to the development that meets the needs of the present without compromising the ability of future generations to meet their own needs, calling for the active participation of all sectors of society in promoting sustainable development. The goal of sustainable development is to realize the harmonious operation of three subsystems, namely, economy, society, and ecology. The world can be simply classified into developed and developing countries. Regardless of which end of the spectrum a nation stands, both extremes have caused environmental stress in the world. Therefore, it is important to understand the differences, and issues between the developed and developing nations, in order to effectively understand the dynamics. Environmental constraints in Developing countries are full of pressures from Population Growth, Inefficient Technology, Weak Governance, Poor Health Sector, Low per capita Income, and Poverty (Demetriade & Hussein 2010). Therefore, the emphasis for developing countries is on the need for progress, a desire to have social and economic growth. Hence, growth would take precedence to the environment. In terms of the perspective from the developed countries, economic growth results in increasing wealth, income, standard of living, and improved health care facilities. This state of affluence on the other hand came at a price of environmental degradation, which commenced from the dawn of the industrial revolution in the 18th Century. The drive to industrial development was based on the increasing use of fossil fuels, raw materials, synthetics and chemicals. This increase consumption and production drive placed great pressures on the environment through overexploitation and depletion of resources, accumulation of CO_2 and greenhouse gases in the atmosphere, pollution, and destruction of eco-systems. Therefore, one can conclude that issues arising in the environment are as a result of both the inadequate development and the result of economic growth in the countries of the world (WECD, 1987)

Therefore, when we think in terms of economic growth, we realise that growth is the major economic goal of many nations (McConnell, 2002). Thus, as a goal, a Nation that can achieve economic growth will be better suited to meet the wants of individuals and resolve socio-economic problems such as poverty (McConnell 2002). Thereby, ensuring the well-being of the economy and improving standard of living, by raising incomes/ providing jobs. In addition, economic growth can possibly

even protect the environment by the creation of parks, reserves, and implementation of key policies. Consequently, some economists have argued that economic growth will eventually lead to an improvement in the environment. This may be so, but the more rapid our growth, consumption and the use of our Natural Capital Resources, the more waste we produce, the more prone we are to environmental degradation and exhaustion. Hence, with economic growth as our goal it is likely to overshadow environmental concerns, placing the environment in the back seat while focus is towards gaining wealth. However, despite this, it is interesting to note that when a country achieves a high standard of living, the people attach value to environmental amenities. In other words, as people become wealthier, they have more time to think about other things than their survival; and with this wealth can influence governments to improve the environment (Serageldin, 1994).

Given that economic development automatically translates to economic growth, which is one of the core visions of many countries (especially developing ones), let us not forget therefore, that one of the ways to achieve this is by constructing solid economic fundamentals by creating various instruments and products in the financial sector as well as creating an inclusive and liquid environment in all these products, widely known as financial deepening. This is because in a developed financial system widens access to funds; conversely, in an underdeveloped financial system, access to funds is limited and people are restricted by the availability of their own funds and have to resort to high cost informal sources such as money lenders. When the availability of funds is limited and the cost is high, there would be the economic activities that can be financed and hence the effect shall be reducing economic growth (Mohan, 2006). There is a general resolution among economists that financial development triggers economic growth. A large number of empirical research works support the forgoing view that development of the financial system contributes to economic growth (Rajan and Zingales, 2003).

There is no doubt that myriads of empirical works exist in the area of financial deepening and economic growth, but most of the studies were based on financial component proxies that may not adequately capture the true measures of financial deepening as it relates to economic growth. They merely analyzed the impact of financial deepening on economic growth without including variables that depict the size of the financial sector in terms of branch expansion or coverage; and many studies expressed market capitalization as a simple percentage of GDP and this does not show in absolute naira terms the size of the capital market. The extent of liquidity as measure by the market turnover was also no captured properly among the variables of existing studies. Furthermore, most of the studies used broad money and credit to the private sector as two different variables in the same econometric model. This may lead to the problem of multicollinearity as credit to the private sector is a sub-set of broad money. Therefore, this study makes a significant contribution by addressing all the identified gaps and recognizes that financial services may affect the growth process through multiple channels, some of which depend on the coverage of the financial institution, while others depend on the level of activities in the stock market.

2. Literature Review

2.1. Conceptual Review

2.1.1. Financial Deepening

Anish (2017) describes financial deepening as a process of achieving a greater penetration of financial services to all levels of society which can either be through the formal banking sector or through informal channels. There are two indicators for this namely, first is the presence of financial institutions and their services across levels of society, and the second is the growth per capita of real cash in hand. The first aspect would of financial deepening indicators is commonly referred to as financial widening as it concentrates on enabling more institutions to provide a wider range of services, triggering inclusive economic growth. In his own account, Andjarsari (2015) defines financial deepening as the increased condition and amount of financial services, with wider alternatives of services that can be accessed by every foreign and domestic investors as well as retail and institutional investors. It also has greater macro effects on the economy as the liquidity and ratio of money supply to GDP is significantly increased.

From the above views about financial deepening, it becomes obvious that financial deepening simply means increasing provision of financial services and that one of its key features is that it accelerates economic growth through the expansion of access to those who do not have adequate finance themselves. Typically, in an underdeveloped financial system, it is the incumbents who have better access to financial services through relationship banking. Moreover, incumbents also finance their growth through internal resource generation. Empirical evidence consistently emphasizes the nexus between finance and growth, though the issue of direction of causality is more difficult to determine. At the cross-country level, evidence suggests that various measures of financial development such as assets of the financial intermediaries, liquid liabilities of financial institutions, domestic credit to private sector, stock and bond market capitalization) are highly and positively associated with economic growth (King and Levine, 1993; Levine and Zervos, 1998). Other studies establish a positive relationship between financial development and growth at the industry level (Rajan and Zingales, 1998).

2.1.2. Benefits of Financial Deepening

In recognition of the critical role being played by financial deepening, Andjarsari (2015) points out the following benefits of financial deepening:

- Through comparative studies and success stories in other countries, financial deepening is shown to have a significant function in supporting economic growth, mitigating systemic risk, sustaining financial stability and trimming down poverty and inequality levels.
- When global volatility occurs, financial deepening can help to slow the effect and prohibit it from falling into a deeper crisis, as the market has a better structure and is built with better defense mechanisms.
- Financial deepening will also create more even wealth and growth distribution. Better access to credit by the poor can reduce poverty by investing in human capital and micro-entrepreneurship. Broadening access to the financial sector and products could benefit the poor through increasing capital flow and allocation, thus gradually reducing inequality.
- Furthermore, financial deepening is needed to provide financing to the small & medium enterprises (SME) as a result of crowding out by large corporations. With a deeper financial sector, larger corporations can raise funding more easily through bonds and equity, so that banking can lend to SMEs.

2.1.3. Challenges of Financial Deepening

Structural characteristics of countries, policy factors, and exogenous influences (e.g., the technology available, socio-political conditions) determine the environment within which financial deepening may either flourish or stagnate. Thus, International Monetary Fund [IMF] (2017) highlights the following obstacles to financial deepening:

- Huge fixed costs in financial provision is responsible for why larger low-income country economies can sustain more diversified financial systems and why, for instance, small island economies tend to have shallow systems. Similarly, low national incomes, a high degree of informality, and low population density are factors that increase the costs and risks for financial institutions. These structural factors work to exclude large segments of the population from formal financial services and explain why many LICs have underdeveloped financial systems.
- A convergence of demand and supply factors limits financial deepening in Less Developed countries.

These impediments not only affect macro-financial stability but also reduce the growth dividends from deepening. At the same time, unsustainable expansion of financial systems can pose risks for stability. Weak and limited supervisory and regulatory frameworks and capacity, deficient early warning and resolution systems, and governance problems in LICs increase the risks of such fragility. The considerable heterogeneity among LICs, however, suggests that there is no "one-size-fits-all" solution. Different areas and approaches may be needed to promote financial deepening generally.

2.1.4. Policies Matter to Resolve Challenges of Financial Deepening

Cross-country experiences in emerging market and low-income countries suggest that targeted and balanced initiatives to encourage competition, put in place information and market infrastructure, address collateral issues, limit excessively intrusive public sector interventions and dominance, maintain macroeconomic stability, and exercise appropriate macro-prudential oversight to avoid creating new sources of instability can help overcome specific impediments to increasing the depth, breadth, and inclusion of financial systems.

2.1.5. Economic Growth and Sustainable Development

It is important to understand, that economic growth is not synonymous with economic development. What this actually means, is that economic development is the advancement of economic wealth of a country, aimed at the overall welfare of the citizens. Achieving overall welfare is accomplished through improving the quality of life, measured by life expectancy, literacy, gross domestic product (GDP) and so forth. While in comparison, economic growth measures in a narrower context using only GDP. Economic growth occurs when real output increases over time. Real output is measured by Gross Domestic Product (GDP) at constant prices, so that the effect of price rises on the value of national output is removed.

Therefore, sustainable economic growth means a rate of growth which can be maintained without creating other significant economic problems, especially for future generations. There is clearly a trade-off between rapid economic growth today, and growth in the future. Rapid growth today may exhaust resources and create environmental problems for future generations, including the depletion of oil and fish stocks, and global warming. Periods of growth are often triggered by increases in aggregate demand, such as a rise in consumer spending, but sustained growth must involve an increase in output. If output does not increase, any extra demand will push up the price level.

Sustainable development is the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend. The desired result is a state of society where living conditions and resource use continue to meet human needs without undermining the integrity and stability of the natural system and sustainable development can be classified as development that meet the needs of the present without compromising the ability of the future generation. The World Commission on Environment and Development (1987) defines the term Sustainable Development as "Development that meets the needs of the present without negatively affecting the ability of future generations to meet their own needs." This concept therefore, takes into consideration the right to development and the protection of the environment. Sustainable Development therefore aims to meet present needs and address short-term issues with the overall goal of long-term Sustainability. Therefore, Sustainable Development is an integrated concept that:

- Requires meeting the basic needs towards the aspiration for a better improved quality life

- Is based on democracy, where the rule of law is grounded in the respect of fundamental rights.
- Promotes employment in an economy, whose strength is based on education, innovation, social cohesion, and the protection of human health and the environment (EEA).

Accordingly, the implementation of Sustainable Development will require progress in three areas, well known as the three (3) pillars of Sustainable Development, which are

Environment, Economic, and Social. These three fundamental pillars are interconnected, so much so, that the actions in one area can reinforce the goals of another. Thus, this indicates the importance and overall goal of achieving integration and a balance between the three pillars of Sustainable Development.

2.1.6. Financial Deepening and Economic Growth: The Nexus

The association between economic growth and financial deepening has been a wide-ranging subject of experiential research. The practical evidence suggests that there is a significant positive relationship between financial development and economic growth. There are several ways in which financial development can affect real growth of output. As observed by Goldsmith (1969) and Bencivenga and Smith (1991), the first way is to increase the volume of investment and the second is to raise the volume and structure of savings. Fry (1988) agrees that these are the basic ways financial development can affect real growth of output. Again, from the works of Greenwood and Jao (1976) and King and Levine (1993), financial development is likely to affect growth by improving the efficiency of investment through project selection, innovation and entrepreneurship growth. This last point is the emphasis laid in the numerous recent endogenous growth models. Financial deepening can have a macroeconomic effect for a country. Financial deepening generally can increase the ratio of money supply to GDP or some price index. It can have the effect of increasing liquidity. Having access to money can provide more opportunities for investment and growth.

2.2. Theoretical Review

2.2.1. Supply-Leading Hypothesis

This study is hinged on the supply-leading and demand-following hypotheses of the financial deepening–growth relationship. The leading proponent of the supply-leading hypothesis are Schumpeter, 1911, supported by Calderon and Liu, 2003, Gurley and Shaw, 1967, King and Levine, 1993, and McKinnon, 1973, among others (Agu and Chukwu, 2008). The hypothesis asserts that financial development has a positive effect on economic growth. Accordingly, the effect runs from financial development to economic growth and it is caused by an improvement in the efficiency of capital accumulation or an increase in the rate of savings as well as the rate of investment. One of the most significant effects of the supply-leading approach is that, as entrepreneurs have new access to the supply-leading funds, their expectations increase and new horizons (or possible alternatives) are opened up, thereby making the entrepreneur "think big".

2.2.2. Demand-Following Hypothesis

The demand-following view, on the other hand, states that financial development responds to changes in the real sector. The Keynesian theory of financial deepening asserts that financial deepening occurs due to an expansion in government expenditure. In order to reach full employment, the government should inject money into the economy by increasing government expenditure. An increase in government expenditure increases aggregate demand and income, thereby raising demand for money (Mckinnon, 1973). Robinson (1952) reveals that it is the necessity from high economic growth that creates demand in the financial sector. Thus, in this view, it is the improvements in the economy that drive higher demand for the use of money, which consequently promotes financial development. In other words, financial markets develop and progress as a result of increased demand for their services from the growing real sector. Causality runs from economic growth to financial development, that is, an increase in economic growth causes a rise in demand for financial services and this results in the expansion of the financial sector (Goldsmith, 1969; Jung, 1986; Kar & Pentecost, 2000; Lucas,1988; Omotor, 2007; Robinson, 1952).

2.2.3. Feedback and Neutral Hypotheses

In between the supply-leading and demand-following hypotheses there are two other views; the first is the feedback hypothesis. This postulates that there is a mutual effect between financial development and economic growth. The second is the neutral hypothesis, which asserts no relationship between financial development and economic growth (Apergis & Levine, 2007).

In conclusion, the causal relationship between financial development and economic growth depends on the stage of economic development. In the early stages of economic development, the supply-leading view can stimulate real capital formation. The development of new financial services creates new opportunities for saver sand investors and causes an increase in economic growth. The supply-leading view become less important as financial and economic development proceed, and gradually the demand-leading view start to dominate. Patrick (1966) states that one industry can be encouraged financially on the basis of a supply-leading view, and, when it develops, its financing shifts to demand-leading. Other industries that are still at a low level of development will remain in the supply-leading phase.

2.2.4. Empirical Review

Tari and Oliver (2017) investigate the nexus between financial deepening and economic growth, and the causality result supports the view that causality runs from financial development to economic growth, implying that the supply-leading hypothesis prevails in Nigeria. The supply-leading hypothesis was developed by Goldsmith, 1969, who suggested that financial development has a positive causal impact on economic growth as it could boost the capital accumulation efficiency and/or increase the level of savings and thus the level of investment, as suggested by McKinnon, 1973, and Shaw, 1967. In other words, through a growth in savings and an increase in investment efficiency, financial development may play a key role in growing national output (Levine, 1997). Moreover, this would create incentives for financial innovations and the implementation of new technology.

In a related study, Adelakun (2010) empirically examines the relationship between financial development and economic growth using GY, which is the annual growth of gross domestic product (GDP), real interest rate (R), the ratio of gross domestic savings to GDP (S), the ratio of domestic credit to private sector to GDP (P), ratio of liquidity liabilities to GDP (M), the ratio of gross fixed capital formation to GDP (I), and trade openness (T). The perceived relationship between financial development and economic growth was estimated using the Ordinary Least Squares Estimation Method (OLSEM). The results showed that there is a substantial positive effect of financial development on economic growth in Nigeria. The Granger causality test showed that financial development promotes economic growth, but there is evidence of causality from economic growth to the development of financial intermediaries.

Similarly, Calderon and Liu (2003) examined the direction of causality between financial development and economic growth by using the Geweke decomposition test on pooled data of 109 developing and industrial countries from 1960 to 1994. The study found out that financial development generally leads to economic growth; the Granger causality from financial development to economic growth and the Granger causality from economic growth to financial development coexist. The study concludes that financial deepening contributes more to causal relationships in developing countries than in industrialized countries. Ndebbio (2004) investigated financial deepening, economic growth, and development for Sub-Saharan African countries. The study employed two financial deepening variables, namely the degree of financial intermediation measured by M2 as ratio to GDP, and the growth rate of per capita real money balances. The study revealed that development in the financial sector of these countries spurs sustainable economic growth.

Johannes et al., (2011) using Johansen cointegration established positive relationships between financial development and economic growth in both the long run and short run in Cameroon for the period 1970–2005 at the 5% level of significance. The results agreed that financial sector development causes economic growth in the long run and the short run, that is, economic growth is a result of financial sector development.

In another line of empirical evidence, Khan (2008) used the Autoregressive Distributed Lag (ARDL) framework to examine the relationship between financial development and economic growth in Pakistan from 1961 to 2005. His results revealed that in the short and long run, financial development and investment impact positively on economic growth. The results also reveal that in the short run, real deposit rate impacts significantly on real output, while in the long run real deposit rate and economic growth have an insignificant positive relationship.

Similarly, Audu and Okumoko, (2013) studied financial development and economic growth in Nigeria. Their study covered the period between 1970 and 2012. The study estimated the long-run relationship between financial development and economic growth using the Johansen full information maximum likelihood method. Empirical results suggest that all the variables used except ratio of money supply to GDP (MGDP) and the ratio of credit issued to non-financial private firms to total domestic credit (CNFPF) positively influenced financial development and economic growth. The Granger causality results revealed that there is a unidirectional relationship running from lending rate to gross domestic product, financial deepening to GDP. Also, a unidirectional relationship runs from bank credit to the private sector via GDP, MGDP, and the ratio of commercial bank deposit to gross domestic product (RDEP), while a bi-directional relationship exists between LCNFPF and LGDP as well as between RDEP and MGDP.

Odeniran and Udeaja, (2010) studied financial sector development and economic growth in Nigeria. Their study covered the period between 1960 and 2009 and four variables—namely, ratios of broad money stock to GDP, growth in net domestic credit to GDP, growth in private sector credit to GDP, and growth in banks deposit liability to GDP—were used to proxy financial sector development, and real GDP per capita was used to measure real growth rates with 1990 as the base year. They tested the competing finance–growth nexus hypotheses using a Granger causality test in a VAR framework. They found that various measures of financial development cause output in the Granger framework even at the 1% level of significance, with the exception of ratio of broad money to GDP. They found the existence of a bi-directional relationship between some of the proxies of financial development and economic growth. They also found that net domestic credit is equally driven by growth in output, indicating unidirectional causality.

3. Methodology

3.1. Data Sources

This study relied on secondary mode of data collection and obtained time series annual data spanning the period 1981 - 2016. All the data were extracted from Central Bank of Nigeria (CBN) statistical bulletin 2016 edition. Although there is

a diversity of institutions that operate in the financial sector with many indicators for different financial institution, this study used bank-based activities, stock market-based size and density of banks measures as financial deepening variables.

3.2. Model Specification

In this study, the model used by Tari and Oliver (2017) in their investigation of the financial deepening and economic growth nexus in Nigeria was adapted. In their specifications, six explanatory variables were used in investigating financial deepening. In the current investigation, six different explanatory variables were used to build the model but some of the variables used in the current study were at variance with the previous studies. The model was formulated such that the real Gross Domestic Product (RGDP) depends on the ratio of broad money supply to Gross Domestic product (M2/GDP), ratio of private sector credit to Gross Domestic product (CPS/GDP), bank density (BD), absolute value of broad money supply (M2), absolute value of stock market capitalization (MCAP) and Number of deals on the stock market (NOD). Therefore, the implicit form of the model is specified as:

RGDP = f (M2/GDP, CPS/GDP, M2, MCAP, NOD, PLR) ....(i)

The econometric equation thus becomes;

RGDP = b0 + b1M2/GDP + b2CPS/GDP +b3M2 + b4MCAP + b5NOD + Ut...... (ii)

Taking the natural logarithm of equation i translate to:

logRGDP = b0 + b1M2/GDP + b2CPS/GDP + b3logM2 + b4logMCAP + b5logNOD + Ut............... (iii)

the logarithms of the variables were obtained in order to bring the time series properties of the variables to the same base.

3.3. Description of Variables

RGDP is the real gross domestic product growth rate which is a proxy for economic growth. This measure provides a high indicative power of the quality and quantity of economic growth. M2/GDP is the ratio of broad money supply to gross domestic product which measures the depth of financial services and product in the economy. CPS/GDP is the ratio of bank credit to private sector to GDP which defines the amount of credit supply to the private individuals in relation to the aggregate economy. Previous studies have revealed that credit to the private sector is the most comprehensive indicator of the activity of financial intermediaries (Levine, Loayza & Beck, 2000). This is because it is associated with the system's ability to mobilize resources from the surplus-saving unit and make them available to the deficit-spending unit. M2 stands for broad money supply which is the aggregate of money available in an economy and this, to a large extent determines the amount of credit that can be granted by the financial intermediaries. MCAP is the absolute naira value the stock market capitalization which shows the overall size of the stock market as a percentage of GDP. The assumption behind this measure is that the overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis (Levine & Zervos, 1996). NOD indicates the number of times transactions are carried out on the floor of the exchange; Turnover identifies the ease and speed with which economic agents can buy and sell securities. With a high turnover, the initial investors do not lose access to their savings for the duration of the investment project because they can easily, quickly, and cheaply sell their portfolio. b0 = Intercept of relationship in the model/constant; b1 – b7 = coefficient of each exogenous variable; Ut = stochastic or error term. The a priori expectations for the coefficients in the model are b1, b2, b3, b4, b5, > 0

3.4. Model Estimation Technique and Method of Data Analysis

With the aid of E-view software, the model was estimated using annual data from 1981-2016. The methods of analysis were by using inferential statistics while the estimation techniques include Ordinary Least Square (OLS) method, Augmented Dickey-Fuller (ADF) Unit Root test, Johansen Co-integration test and Autoregressive Distributed Lags (ARDL) model. Once the cointegration and stationarity of variables were established, the model in eq.(iv) was estimated using the ARDL model estimator for logRGDP. In the final stage we estimated the short run dynamic parameters by estimating an error correction model (ECM) associated with the long run estimates.

4. Data Analysis

4.1. Stationary Test

Most economic time series are non-stationary time series and generally exhibits a stochastic trend. A stochastic process is said to be weakly stationary if its mean and variance are constant over time and if the value of the covariance between two time periods depends only on the distance or lag between the two periods and not the actual time at which the covariance is computed. We begin the ADF test procedure by examining the optimal lag length using Akaike's Information Criteria (AIC), before proceeding to identify the probable order of stationarity. The results of the tests for all the variables and for the three alternative models are presented in table 1.0, first for their logarithmic levels, and then (in cases where it was found that the series contain a unit root) for their first and second differences.

Variables	Constant	Constant and Trend	None	K	Order of Integration
RGDP	-0.173422	-1.489658	3.339424*	8	I(0)
M2/GDP	-0.603188	-2.324244	1.711327	8	-
CPS/GDP	-0.208758	-1.675650	1.084900	8	-
M2	1.617977	-0.633448	1.630056	8	-
MCAP	-0.690268	-1.277964	1.728418	8	-
NOD	-1.291556	-3.125337	1.824497	8	-
PLR	-1.391723	-5.074855*	-0.525907	8	I(0)
Unit Root Test at First Differences					
Variables	Constant	Constant and trend	None	k	Order of integration
RGDP	-4.205650*	-3.783713*	-	8	I(0)
M2/GDP	-4.544177*	-4.766022*	-4.978073*	8	I(I)
CPS/GDP	-4.901402*	-5.093009*	-4.691608*	8	I(I)
M2	-2.875280	-3.153312	-0.531482*	8	I(I)
MCAP	-4.286893*	-4.070828*	-3.028181*	8	I(I)
NOD	-5.827701*	-1.134005	-1.034018	8	I(I)

Table 1: Augmented Dickey-Fuller Test Results Unit Root Test at Logarithmic Levels
H0: B = 0; Ha: B > 0

Notes: *Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationary. Critical values obtained from ADF critical values are -2.954021, -3.557759 and -1.951332 for the first, second and third model respectively. The optimal lag lengths k was chosen according to Akaike's Information criteria.

The stationary results in table 1.0 above indicate that each of the series is non-stationary when the variables are defined in levels with the exception for real GDP and Prime Lending Rate (PLR) variables, where the tests indicate that they are I(0). However, first differencing the series removes the non-stationary components in all other cases and the null hypothesis of non-stationarity is clearly rejected at 5% significance level suggesting that all other variables (except M2) are integrated of order one I(I). M2 was further subjected to test and found integrated at second difference I(2). However, the robustness of the two first models allows us to treat the variable as I(I). Thus, because of the different orders of integration of the variables, Auto-regressive Distributed Lags (ARDL) model was used to estimate the impact of financial deepening on the growth of Nigerian economy.

4.2. Autoregressive Distributed Lag (ARDL) Model

The ARDL model proposed by Pesaran, Shin and Smith (2001) is adopted in this paper. The model is advantageous as it can be applied on a time series data irrespective the different orders of integration of the variables. In addition, a dynamic error correction model (ECM) can be derived from the model, which makes the estimation of both the short run dynamics and long run equilibrium possible simultaneously after a multivariate cointegration test. Also, the test is relatively more efficient in small sample data as in case in this paper. Thus, the unrestricted error correction model (UECM) of ARDL model used to examine the long run and the short run relationship takes the following forms:

$\Delta \log RGDP = \beta_0 + \beta_1 M2/GDP_{t-1} + \beta_2 CPS/GDP_{t-1} + \beta_3 \log M2_{t-1} + \beta_4 \log MCAP + \beta_5 \log NOD + \Sigma \pi_i \Delta \log RGDP_{t-1} + \Sigma \theta_i \Delta \log M2/GDP_{t-1} + \Sigma \gamma_i \Delta \log CPS/GDP_{t-1} + \Sigma \lambda_i \Delta \log M2_{t-1} + \Sigma \varphi_i \Delta \log MCAP_{t-1} + \Sigma \mu_i \Delta \log NOD_{t-1} + \Sigma \tau_i \Delta \log M2_{t-1} + U_t$ ....(iv)

The variables are as earlier defined under variable description. β_1, β_2, β_3, β_4, β_5 and β_6 refer to the long run coefficients or multipliers while π_i, θ_i, γ_i, λ_i, φ_i, μ_i, τ_i are the short run coefficients or multipliers. In the final stage we estimate the short run dynamic parameters by estimating an error correction model (ECM) associated with the long run estimates as follows:

$\Delta \log RGDP = \beta_0 + \beta_1 M2/GDP_{t-1} + \beta_2 CPS/GDP_{t-1} + \beta_3 \log M2_{t-1} + \beta_4 \log MCAP + \beta_5 \log NOD + \Sigma \pi_i \Delta \log RGDP_{t-1} + \Sigma \theta_i \Delta \log M2/GDP_{t-1} + \Sigma \gamma_i \Delta \log CPS/GDP_{t-1} + \Sigma \lambda_i \Delta M2_{t-1} + \Sigma \varphi_i \Delta MCAP_{t-1} + \Sigma \mu_i \Delta NOD_{t-1} + \Sigma \tau_i \Delta M2_{t-1} + \Psi ECM_{t-1} + e_t$

Where π_i, θ_i, γ_i, λ_i, are short run dynamic coefficients to equilibrium and ΨECM_{t-1} is the coefficient that measure the speed of adjustment or convergence of $\Delta \log$ RMGDP to the equilibrium in case there is deviation; which must be negative and statistically significant for us to say that it is rightly signed.

Estimated Short Run Coefficients with ARDL (Co-Integrating Form)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-3.153777	0.557469	-5.657317	0.0299
D(LRGDP(-2))	-2.323144	0.433082	-5.364218	0.0330
D(LRGDP(-3))	1.179447	0.205848	5.729707	0.0291
D(M2_GDP)	0.118333	0.019771	5.985232	0.0268
D(M2_GDP(-1))	0.097101	0.015511	6.260312	0.0246
D(M2_GDP(-2))	0.008037	0.004729	1.699512	0.2313
D(M2_GDP(-3))	0.020950	0.006038	3.469896	0.0740
D(CPS_GDP)	-0.073598	0.011002	-6.689414	0.0216
D(CPS_GDP(-1))	-0.050707	0.007096	-7.145464	0.0190
D(CPS_GDP(-2))	-0.061416	0.008647	-7.102564	0.0193
D(CPS_GDP(-3))	-0.039336	0.005813	-6.767183	0.0211
D(LM2)	-1.634039	0.244825	-6.674308	0.0217
D(LM2(-1))	-1.225163	0.239839	-5.108284	0.0363
D(LM2(-2))	0.875258	0.140429	6.232736	0.0248
D(MCAP)	-0.000033	0.000006	-5.832705	0.0282
D(MCAP(-1))	0.000027	0.000005	5.310219	0.0337
D(MCAP(-2))	0.000013	0.000005	2.835914	0.1051
D(MCAP(-3))	0.000072	0.000011	6.492547	0.0229
D(LNOD)	-0.159884	0.031981	-4.999340	0.0378
D(LNOD(-1))	-0.149773	0.019261	-7.775947	0.0161
D(LNOD(-2))	-0.297028	0.046098	-6.443424	0.0232
D(LNOD(-3))	0.049062	0.031684	1.548449	0.2616
ECM(-1)	-0.391818	0.213376	1.836283	0.2077

Table 2: ARDL Error Correction Regression and Estimated Long-run Coefficients
ARDL Co-Integrating and Long Run form
Dependent Variable: LRGDP
Selected Model: ARDL (4, 4, 4, 3, 4, 4)
Date: 06/04/18   Time: 15:57
Sample: 1982 2016
Included observations: 31

R-squared	0.999982	Mean dependent var	10.32272
Adjusted R-squared	0.999726	S.D. dependent var	0.506179
S.E. of regression	0.008383	Akaike info criterion	-7.595005
Sum squared resid	0.000141	Schwarz criterion	-6.253533
Log likelihood	146.7226	Hannan-Quinn criter.	-7.157718
F-statistic	3905.938	Durbin-Watson stat	2.767039
Prob(F-statistic)	0.000256		

Table 3

Considering the estimated coefficients displayed in table 2.0, R2 value of 99% shows a reasonable goodness of fit of the fitted data series in the model; this shows that the explanatory variables are responsible jointly for 99% variation in the endogenous variable. The probability value of 0.000256 is less than the critical value of 0.05 which confirms that the percentage of variation in the endogenous variable which is caused by the explanatory variables is not due to chance or error and that the explanatory variables are statistically significant to the estimated model. The Durbin Watson value of 2.767 is greater than the benchmark of 2 and translates that the model is free of autocorrelation complicity. The F-statistic of 3905.938 is large enough and significant, translating that, the exogenous variables are strong predictors of the endogenous variable and the overall performance of the model is good. Also, from the result of the analysis, lag 1 and 2 of the RGDP is found to be negatively and significantly affecting the current value of real RGDP; while lag 3 of RGDP is positively but significantly affecting RGDP over the period of the study. For ratio of broad money to GDP (M2/GDP), both the current value and lag 1 to 3 values are all found to be positively related to the current value of RGDP; meanwhile, while its current value and lag 1 value is positive and significant, the lag 2 and 3 values are insignificant to economic growth. The forgoing means that 1% increase in broad money supply to GDP will increase the economic growth by 11.8% in conformity with the apriori expectation. This connotes

that extent of financial deepening determines to a large extent the growth in the economy. The both the current and all the lag values of CPS/GDP are negatively related to economic growth, and this is against the apriori expectation. The forgoing could mean that credit to private supply have not been channeled to highly productive activities that could increase the overall output of the economy. Thus, 1% increase in CPS/GDP will significantly reduce economic growth by 7.4% and vice versa. The broad money supply (M2), against apriori expectation also exerts negative pressure on economic growth, except its lag 2 such that 1% rise in M2 will culminate in about 1.63% decrease in the average mean value of economic growth, which could also mean that quantity of money supply in itself has no economic value unless invested in productive activities. The finding of this study thus points to the fact that the bulk of the money supply has been left fallow instead of using them for productive purpose, perhaps, the credit providers are holding on to their money for fear inherent and probable bad and irrecoverable debts associated with lending activities. Its impact is however insignificant at 5% level to the estimated model. Furthermore, market capitalization (MCAP) is positively signed both in its current and lag values, translating that it exerts positive and significant relationship with economic growth, obviously in corroboration of the a priori expectation. The market turnover as proxied by number of transaction deals (NOD) on the stock market shows negative relationship with economic growth, and this contradicts the a priori expectation. The impact of exerted by NOD is significant with p-value of 0.0378 which is less than the 0.05 significance level. Therefore, 1% increase in the frequency at which transactions take place on the stock market will decrease the mean value of economic growth by about 16% and vice versa, with the exception of its lag 3 which is positively but insignificantly related to economic growth. The economic implication of the relationship is that the more difficult it is for investors to access liquidity in the stock market, the less the orders are placed for the purchase and sales of financial instruments on the floor of the stock market and this frustrates the mobilization of funds to productive sectors that have direct bearing with economic growth. The coefficient of error correction model (ECM) is -0.391818 and statistically significant at 5% level with p-value of 0.20177 with t-statistic of 1.8363, and with expected sign. The negative value shows that there exists an adjustment speed from short run disequilibrium to long run equilibrium. This indicates that about 39% of deviations from the equilibrium level in the current year will be corrected in years following. This means that when the economic growth is at disequilibrium level due to experience of any shock by the explanatory variables, the speed of its adjustment to converge to equilibrium is 39%.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2_GDP	0.070969	0.052693	1.346855	0.3103
CPS_GDP	-0.195825	0.093310	-2.098651	0.1707
LM2	0.572099	0.217877	2.625787	0.1196
MCAP	0.000320	0.000125	2.554580	0.1251
LNOD	-0.907933	0.449248	-2.021004	0.1807
C	15.990121	3.283057	4.870497	0.0397

Table 4: Estimated Long Run Coefficients with ARDL
ECM (-) =logRGDP-0.0710M2/GDP -0.01958CPS/GDP
+ 0.5721logM2 + 0.0003logMCAP – 0.9079logNOD + 15.9901

In the estimated long-run relationship depicted in table 6.0 above, it shows that all the variables of interest affect economic growth in the log-run. Hence, in the long-run, 1% increases in ratio of broad money to GDP with insignificantly increase economic growth by 7% and vice versa. Furthermore, while the ratio of credit to private to GDP shows negative relationship with economic growth, broad money supply (M2) shows positive relationship with economic growth; such that 1% increase in CPS/GDP will culminate in about 19.6% insignificant decrease in economic growth and vice versa, while 1% increase in broad money supply will insignificantly cause the average mean value of economic growth to increase by about 5.8%. Market capitalization also exhibit positive relationship with economic growth and this connotes that 1% increase in market capitalization will have insignificant impact by increasing the mean value of economic growth by 0.03% and vice versa. Number of deals on the other hand has significant negative impact on economic growth and this also means that 1% increase or decrease in number of transaction conducted on the stock market will decrease or increase the average value of economic growth by 9.1%.

ARDL Bounds Test		
Test Statistic	Value	k
F-statistic	32.78868	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Table 5: ARDL Co-integration Bound Test Result
Date: 06/04/18   Time: 17:15
Sample: 1986 2016
Included observations: 31
Null Hypothesis: No long-run relationships exist

The F-statistic value of 32.78868 is evidently above the I(0) critical value bound. This indicates that we reject the null hypothesis that there is no existence of long-run relationship among the variables of interest.

5. Diagnostics Test of Residuals

5.1. Autocorrelation Test
To verify whether the residuals from the model are free from autocorrelation or serially uncorrelated, Breusch-Godfrey serial correlation test was conducted and the result are depicted in the table 4.0 below:

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.851731	Prob. F(1,1)	0.5255
Obs*R-squared	14.25890	**Prob. Chi-Square (1)**	0.0002
F-statistic	1.661867	Prob. F(2,4)	0.2983
Obs*R-squared	14.06875	Prob. Chi-Square(2)	0.0009

Table 5: Breusch-Godfrey Serial Correlation Lm Test

Since the null hypothesis is that the residuals are serially uncorrelated, the F-statistic p-value of 0.5255 indicates that we fail to reject the null hypothesis at both 1% and 5% significance levels. We therefore conclude that the residuals are serially uncorrelated. The forgoing position is confirmed by the Durbin-Watson Stat. of 2.77

5.2. Homoskedasticity Test
The Breusch-Pagan-Godfrey homoskedasticity test results on the residuals from the models are depicted in the table 6.0 below:

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	5.527760	Prob. F(28,2)	0.1645
Obs*R-squared	30.60453	Prob. Chi-Square(28)	0.3349
Scaled explained SS	0.110993	Prob. Chi-Square(28)	1.0000

Table 6

Since the null hypothesis is that the residuals are homoskedastic, the F-statistic p-value of 0.1645 indicates that we fail to reject this null hypothesis at both 1% and 5% significance levels. We therefore conclude that the residuals are homoskedastic.

6. Conclusion and Recommendations
The impact of financial deepening on economic growth in the face of sustainable economic development has been examined in this paper from 1982-2016. Obviously, financial deepening plays a crucial role in promoting economic growth. The study employed Autoregressive Distributed Lags (ARDL) model and the and Error Correction Method. The co-integration test shows the existence of negative long run relationship among ratio of credit to private sector to GDP, ratio of broad money supply to GDP and number of deals on the stock market; in addition, there exist a positive long run equilibrium relationship among broad money supply, market capitalization and economic growth. The bound test also confirms the existence of long

run equilibrium relationship among the variables. The error correction method reveals that a deviation from the equilibrium level in the current year will be corrected by 39% in years following; meaning that when economic development is above or below its equilibrium level, the speed of its adjustment to converge to equilibrium is 39%. The coefficient of multiple determinations (R2) in the ARDL model is 99% and the corresponding p-value is 0.000256 which led to the overwhelming rejection of the null hypothesis which states that financial deepening does not have a significant impact on the economic growth in Nigeria. Hence, it is concluded that financial deepening has significant impact on economic growth in Nigeria. Also, the F-statistics shows that the time to time behaviour of the explanatory variables all put together cause a significant change on the economic growth. Based on the findings in this study, recommendations were made as follows:

- Firstly, the monetary authorities should ensure optimal money supply while monitoring to ensure that the bulk of the money supply is put into productive use rather than left idle, as this will bring about positive relationship between money supply and economic growth;
- Secondly, that government through the provision of enabling environment should continue to encourage the private investors to invest in the productive sectors of the economy rather than embracing investment that have no direct bearing with economic prosperity.
- Thirdly, number of transaction deals were found to be negatively related to the growth of economy in this study, it is consequently recommended that government should ensure stabilization and possible reduction in the transaction circle in the capital market while facilitating easy access to fund so as to ensure high market liquidity aided by continuous patronage of the investors as this will yield eventual growth in the economy.
- The relationship of the ratio of broad money supply to GDP is negative, translating to lack of financial deepness caused by the paucity of money supply, government should therefore ensure that that there is optimal money supply that is commensurate with economic growth.

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