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Let's listen to Sarma: developing an index of financial inclusion for Nigeria.

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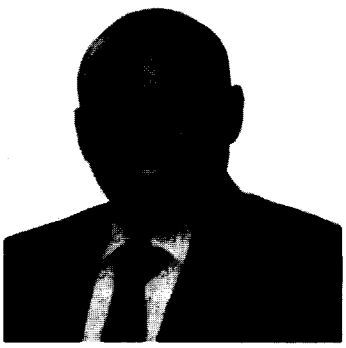
Let's Listen to Sarma: DEVELOPING AN INDEX OF FINANCIAL INCLUSION FOR NIGERIA[2]



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Abstract

The National Financial Inclusion Strategy of the Central Bank of Nigeria was designed to reduce the percentage of adult Nigerians excluded from financial services from 46.3 per cent as at 2010 to 20.0 per cent by 2020. As a component of the policy tool kit, the strategy makes provision for annual data gathering to measure progress in financial inclusion drive of the Bank. This approach and others recognised by the CBN are mostly survey based, hence occasional and expensive. In order to facilitate cross-country comparison, this study adopted Sarma (2008, 2012) to compute a composite index for financial inclusion for Nigeria from 2007Q1 to 2016Q2. The results indicate that financial inclusion effort of the CBN is yielding the desired result, particularly in term of penetration dimension.

In other words, there is increase in coverage with limited access to the services rendered by these institutions that could be of immense benefit to the customers. The study therefore, recommends that, CBN should not concentrates effort on reducing the percentage of adult Nigerians excluded from financial services alone, but also ensure that the customers benefit from financial services so as to enhance their participation in the developmental process. An inclusive financial system requires more than the size of the banked population, it includes the availability of banks services (such as credit facilities) and relative ease with which the services can be accessed.

***Key words:** Financial inclusion, Cartesian space, Strategy, Nigeria*
***JEL Classification:** G00, G21, O16*

1. Introduction

As far back as 2007, Mandira Sarma[3] constructed a composite index for financial inclusion and there seems to be, a decade later, what can best be described as a continuous search for an index to measure progress in financial coverage. According to Sarma (2008), the need for a composite index of financial inclusion arises due largely to the inability of a single indicator (such as number of bank account per 1,000 adults, number of banks branches per 100,000 adults, domestic credit as percentage of gross domestic product (GDP) as well as domestic deposit as percentage of GDP) to capture the progress in inclusive financing. Moreso, having a single indicator for financial inclusion with a unified methodology can, at any particular point in time, facilitate cross country comparison, hence avails policy makers the opportunity to determine the progress in curtailing financial exclusion.

Sarma (2008) identifies three distinct criteria which must be satisfied for a fairly good attempt at developing a composite indicator of financial inclusion, namely; larger component of different dimensions of financial inclusion must be incorporated; it must be easy and simple to compute as well as comparable across countries. To satisfy the condition of broad coverage of various dimensions of financial inclusion, she developed three distinct dimensions covering the entire aspect of banking services, namely: banking penetration, availability of

The views expressed herein are solely mine and should not in any way be misconstrue for that of Central Bank of Nigeria.

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banking services and banking usage dimensions. She then computed the index for 2004 across some selected developed, emerging market and developing economies excluding Nigeria.

The recognition of the negative impact of financial exclusion on development is mirrored in the 1776 work of Adam Smith, who highlighted the critical role of banks in stimulating economic development. This was re-echoed by the world leaders at a World Economic Summit in 2005 where vital function was ascribed to inclusive finance in the attainment of the Millennium Development Goals (MDGs). Following this therefore, it is safe to conclude that economists as well as world leaders have recognised financial inclusion as a means of reducing income inequality, minimising the incidence of poverty and thus enhancing an all-inclusive participation in the developmental process.

The Central Bank of Nigeria (CBN), as a signatory to the 2011 Maya declaration, developed a National Financial Inclusion Strategy (NFIS) for Nigeria in 2012 with the main objective of reducing the percentage of adult Nigerians excluded from financial services from 46.3 per cent as at 2010 to 20.0 per cent by 2020. This study attempts to measure the country's progress, from the supply side, in inclusive financing as contained in the 2012 financial inclusion strategy for the country using Sarma (2008) methodology. This will enable the CBN and other interested parties not only to determine the progress made in the implementation of the financial inclusion strategy of the Bank over the years, but peer review the country with her contemporaries.

To achieve this, the study is divided into five sections. Following this introduction is Section Two which briefly reviews the current structure of the Nigerian financial system and the recent initiatives by the CBN to enhance financial inclusion. Section three, in line with Sarma (2008) but with slight modification, details the methodology for constructing the index, while section four analyses the result and the last section concludes the paper.

2.0 Brief Review of the Current Structure of the Nigerian Financial System

Closely related to the objective of the study, the Nigerian financial landscape in 2016can be discussed from two perspectives: the regulators and the operator's perspectives.

The regulators

Central Bank of Nigeria (CBN): The CBN serves as the regulatory institution of the financial system. The law establishing the Bank was enacted in 1958 while it commenced operation in 1959. The Bank is saddled with the responsibility of ensuring price and financial system stability, achievable through effective and efficient regulation and supervision of the financial institutions and conduct of monetary policy.

Nigerian Deposit Insurance Corporation (NDIC): it was Established in 1998, and is saddled with the responsibility of protecting depositor's funds. It also has the duty of fostering monetary stability and promotion of efficient and effective payment system.

The Operators

Deposit Money Banks (DMBs): According to the Organisation for Economic Cooperation and Development (OECD), DMBs are resident depository institutions and quasi-corporations that acquired deposits liabilities payable on demand, transferrable by cheque or otherwise, usable for making payment. The DMBs in Nigeria are licensed by the CBN. As at November 2016, there are twenty four (24) DMBs in Nigeria, of which nineteen (19) are commercial banks, four (4) are merchant banks and one (1) is a non-interest bank. It is however important to note that during the first half of 2016 a new license was issued for the establishment of one more commercial bank.

Microfinance Banks: As the name implies, these are companies licensed by the

Central Bank of Nigeria to provide microfinance services to the economically active poor, micro, small and medium enterprises, so as to enable them carry out or expand their businesses with relative ease. In addition to the existing Nine hundred and seventy nine (979) functional microfinance banks, eighteen (18) new licenses were issued in the first half of 2016.

Primary Mortgage Institutions: The CBN(2003) Guideline for Primary Mortgage Institutions (PMIs) describes PMIs as companies licensed to carry out mortgage business in Nigeria. Mortgage business, according to the guideline, includes but not limited to; granting of loans or advances for building, improvement or extension or purchase of dwelling/ commercial houses. There are, as at November 2016, a total of thirty five (35) PMIs in Nigeria.

Nigeria Export-Import Bank (NEXIM): This is an export credit agency established in 1991 to replace the Nigerian Exports Guarantee and Insurance Corporation with the aim of providing exports credit guarantee and insurance for exports of the Nigerian commodities to the international market.

Finance Companies/Houses: These are companies that specialise on short-term non-bank financial intermediations through borrowing of funds from the investing public for onward lending to the public in the form of local purchase order (LPO), equipment financing and debt factoring. Three (3) new licenses were granted by the CBN in the first half of 2016, in addition to the existing sixty four (64) Finance Houses(FHs).

Discount Houses: Following the CBN Guideline for Discount Houses (DHs), the DHs are any financial institution in Nigeria that transacts discount business which consist of trading in and holding of treasury bills, commercial bills and other securities. Although, the number of DHs had risen to six (6) in the past, there are presently no DHs in Nigeria. Most of the DHs have converted to merchant banks.

Bank of Industry (BoI): This is one of the major development finance institutions in Nigeria established in 1964 as Nigerian Industrial Development Bank Limited (NIDB). It aims at providing financial assistance for the establishment/expansion/modernisation of large, medium and small projects.

Bank of Agriculture (BOA): It is an agricultural and rural development finance institution initially incorporated in 1972 as the Nigerian Agricultural Bank (NAB) and later in 1978 renamed the Nigerian Agricultural Cooperative Bank (NACB). The Bank of Agriculture as it is today is a result of the merger of the Nigerian Agricultural Cooperative Bank (NACB), People's Bank of Nigeria (PBN), and the Family Economic Advancement Programme (FEAP). The bank is statutorily responsible for the provision of credit to support the activities in the agricultural value chain.

The Infrastructure Bank: This is a development finance institution with a major focus on the development of infrastructure as the name implies. It supports long-term infrastructure projects such as transportation, infrastructure, municipal common services, mass housing and district development, among others. It was established in 1992 as Urban Development Bank (UDB).

2.1 Recent Initiative of the Central Bank of Nigeria to Enhance Financial Inclusion

The Central Bank of Nigeria had initiated several policies and programmes in the past to boost financial inclusion, besides the initiatives of the federal, states and local governments. The most recent and worthy of mention is the National Financial Inclusion Strategy lunched in October 2012. The strategy provides a blue print aimed at guiding the activities of all stakeholders in terms of advancing financial inclusion. The major drivers of the strategy are; agent banking, Tiered Know-Your-Customer requirement, financial literacy, consumer protection, linkage banking, implementation of Micro, Small and Medium Enterprises Development Fund (MSMEDF) and credit enhancement programmes (CEPs). The CEPs includes Nigerian Incentive-Based Risk sharing System for Agricultural Lending (NIRSAL), Refinancing and Rediscounting Facilities for Small and Medium Enterprises, Small and Medium Enterprise Guarantee Scheme Funds and establishment of Entrepreneurship Development Centres (EDCs), among others.

To ensure effective implementation of the strategy, the Bank established a Financial Inclusion Secretariat which is saddled with the responsibility of coordinating the activities of the stakeholders, collect and collate data to analyse progress on financial inclusion and serve as the Secretariat for the Financial Inclusion Steering Committee (FISC) and Financial Inclusion Technical Committee (FITC).

In order to facilitate efficient operations of the drivers of the financial inclusion strategy, the CBN further developed the framework for agent banking, MSMEDF, Mobile Money Operations, financial literacy and know-your-customer requirements.

During the first half of 2016, the CBN embarked on some programmes to further fast track the implementation of the National Financial Inclusion Strategy. Prominent among these programmes are:

a) Setting Targets on Financial Inclusion for Banks: The Financial Inclusion Secretariat and four selected commercial banks were directed to set target for banks in terms of products and channels that are capable of enhancing financial inclusion. The areas considered includes number of new accounts, loans granted, bank agents deployed, banks branches established in selected local government areas all in a year.

b) Digitalisation of Financial Services: As a starting point, the CBN recognised two schemes to drive digital financial inclusion in the country. The schemes are: E-Wallet for Farmers and Social Safety Nets.

c) National Financial Inclusion Strategy for States: The technical committees are set up at state level to facilitate implementation of the financial inclusion strategy.

d) Review of Mobile Money Regulation: mobile money regulation was reviewed with the aim of promoting the adoption of mobile money. The changes include, the Super-Agent framework, issuance of Shared Agent Network Regulation and new mobile money services guidelines.

3.0 Methodology and Data

3.1 Methodology

Following Sarma (2008) the computational procedure of the three interrelated dimensions of financial inclusion includes penetration, services and usage dimensions.

The Penetration Dimension is given as:

$$PI_t = \frac{ba_t}{adult_t} \quad (1)$$

Where PI is the penetration index, badenotes the number of bank accounts, adult represents the total adult population and t is the time dimension.

According to Sarma (2008), considering the importance of the number of users in inclusive financing, Penetration Index (PI) connotes the availability of banking services to the people. The value of this measure equals one, if every adult in the study area has at least one account and zero otherwise. Due to data paucity, however, Sarma (2008) adopts the proportion of number of bank accounts to total adult population.

The Services Dimension takes the form of:

$$SI_t = \omega_1 \frac{b_t}{adult_t} + \omega_2 \frac{atm_t}{adult_t} \quad (2)$$

Where SI is services index, b is the number of branches, atm represents the number of automated teller machines and adult represents adult population.ω_1 and ω_2 are the respective weights of the variables. Ease of access is at the core of an inclusive financial system.

The Usage Dimension is presented as:

$$UI_t = \frac{dc_t + dl_t}{y_t} \quad (3)$$

Where UI represents usage index, dc is domestic credit, dldenotes deposit liabilities and y stands for the level of economic activities proxy by gross domestic product (GDP). This index is paramount, as it is not only access to services that matters but also the usage of the services, hence the importance of this dimension

The resultant indexes from implementation of equations (1) to (3) are standardised as:

$$I_i = \frac{V_i - mn_i}{mx_i - mn_i} \quad (4)$$

Where I_i is the index of dimension i, V is the actual value of dimension i, while mn represents the minimum value of dimension i and mx is the maximum value of the dimension. Equation (4) yields result that lies between 0 and 1. The closer the value of a particular index to 1 the better the level of the dimension and vice versa.

Further consolidation of PI, SI and UI, yields another set of two indexes given as:

$$Index\ 1_t = \frac{\sqrt{PI_t^2 + SI_t^2 + UI_t^2}}{\sqrt{(\varpi_p^2 + \varpi_s^2 + \varpi_u^2)}} \quad (5)$$

Where PI, SI and UI represent penetration, services and usage indexes, respectively.ϖ_p, ϖ_s and ϖ_u are the weights of penetration, services and usage dimensions, respectively. The equation is the normalised Euclidean distance of Index 1 from point O which indicates a worst situation in term of financial inclusion.

$$Index\ 2_t = 1 - \frac{\sqrt{(\varpi_p - PI_t)^2 + (\varpi_s - SI_t)^2 + (\varpi_u - UI_t)^2}}{\sqrt{(\varpi_p^2 + \varpi_s^2 + \varpi_u^2)}} \quad (6)$$

Where all variables are as defined under equation (5).

Index 2 presents the inverse of the normalised Euclidean distance from point w which is the ideal point. This according to Sarma (2008) is to ensure that the higher value of index 2 corresponds to the higher value of financial inclusion.

The final Index (IFI) is then derived as the arithmetic mean of indexes 1 and 2:

$$IFI_t = \frac{Index\ 1_t + Index\ 2_t}{2} \quad (7)$$

3.2 The Decision Rule

Since the resultant index lies between 0 and 1(lower and upper boundaries),Sarma, (2008, 2012) provided a decision rule that helps in assessing the level of a country at any particular point in time on the Cartesian space. Points 0 on the Cartesian space is the base, implying perfect financial exclusion and point Wis the target, connoting perfect financial inclusion. In between the two extremes on the Cartesian space is financial inclusion at various levels. The following rule following Sarma (2008) can be applied to the resultant financial inclusion index to determine a country's level in terms of inclusive financing.

$$HFI = 0.5 < FII < 1 \quad (8)$$

$$MFI = 0.3 < FII < 0.5 \quad (9)$$

$$LFI = 0 < FII < 0.3 \quad (10)$$

Where HFI, MFI and LFI implies high financial inclusion, medium financial inclusion and low financial inclusion, respectively.

4.0 Interpretation of Results and Some Practical Caveat

4.1 Interpretation of Results

Figure 1 depicts Indexes 1 and 2 as presented by equations (5) and (6). While Index 1 is plotted on primary axis, Index 2 is charted on secondary axis. A close scrutiny of both charts reveals that the trends are the same, only the magnitude differs. Both indexes report the trough to be the first quarter of 2008 and fourth quarter of 2013 as the plough. In other words, both Indexes 1 and 2 were at the bottom in 2008Q1 and at the peak in 2013Q4.Importantly, the IFI averaged both indexes throughout the studied period, implying that it is a true representative of its components.

Figure 2 illustrates the IFI for Nigeria for the study period calculated as presented in

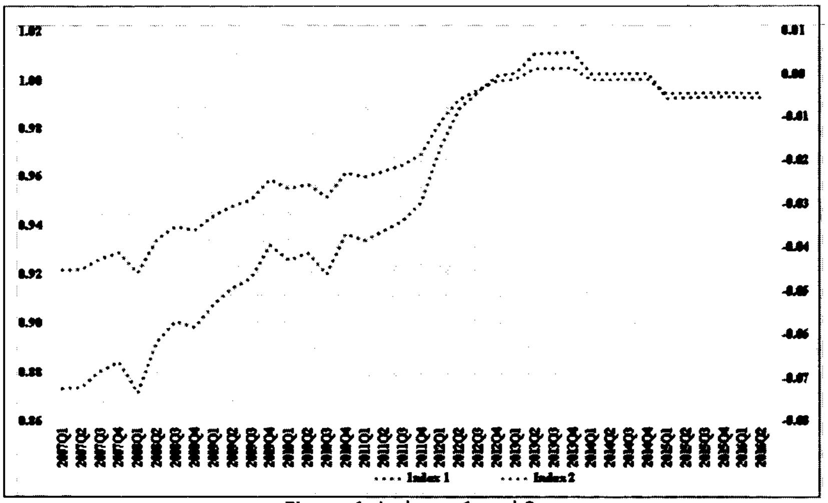

Figure 1: Indexes 1 and 2

equation (7). To start with, it is important to note that the IFI lies between 0 and 1.Point 1, for instance, indicates perfect financial inclusion, which implies that the country has achieved the target of covering 80.0 per cent of the total adult population as proclaimed in the National Financial Inclusion Strategy. Reducing the number of financially excluded adults by the year 2020 to 20.0 per cent translates to increasing the number of adult population that are financially included to 80.0 per cent. Point 0 implies the reverse. Any point in between 0 and 1 signifies the level of financial inclusion at that particular time. The closer the index to one (1), the more financial inclusive is the country and the closer it is to zero (0), the more the financial exclusion. In other words, given the target of 80.0 per cent set to be attained by the CBN in 2020, it follows that, the more the IFI approaches one, the closer the attainment of the financial inclusion target of the CBN.

Visual inspection of figure 2demonstrates that Nigerians, during the study period, were most financially excluded in the first quarter of 2008 and most financially included in the fourth quarter of 2013. Interestingly, these periods coincided with the period of trough and plough of Indexes 1 and 2, respectively. The Index of Financial Inclusion was at 0.425 at the beginning of the study period and rose gradually and steadily to 0.505 in the fourth quarter of 2013 except for marginal declines comparatively to the preceding quarters, in the first and third quarters of 2008 and 2010, respectively,

From the peak of 0.505 recorded in 2013Q4, the IFI for Nigeria fell slightly to 0.500 and remained stable until the first quarter of 2015 when it further dipped to 0.495 where it persisted till the end of the study period.

Following equations (8) to (10), Nigeria can be said to be a medium financial inclusion country striving to join the high financial inclusive countries. Although, it had veered briefly into the class of the high financial inclusion (0.51) in Q4 of 2013, but could not sustain the drive as it did not last more than a quarter.

To get a clearer picture of the dimension that is driving the country's financial inclusion, we further explore the country's stance in the 3-dimensional Cartesian Space,

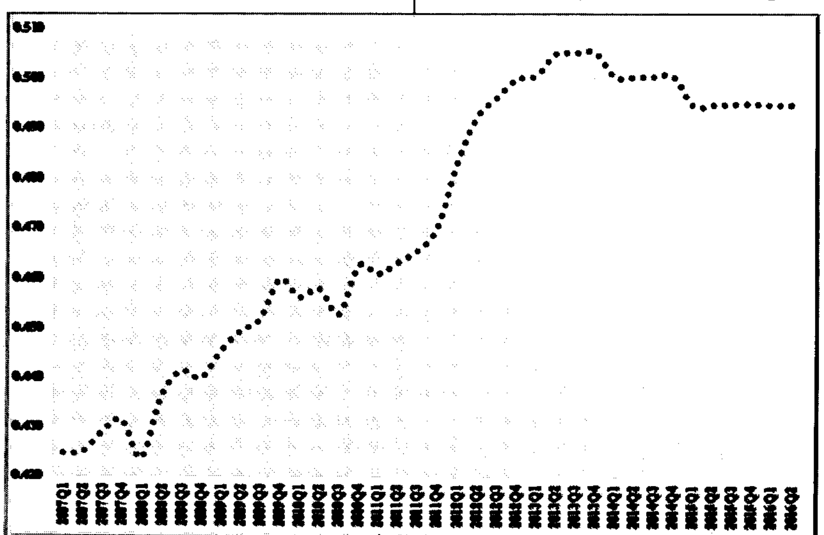

Figure 2: Financial Inclusion Index for Nigeria, 2007Q1 to 2016Q2

presented as Figures 3 to 12. The blue, red and Olive green lines in all the figures represent penetration, services and usage indexes, respectively. Careful examination of the figures shows that Penetration Index (PI) has really been on the increase since the beginning of the study period. It started from 0.096 in 2007Q1 and rise steadily until it reached an all-time peak of 0.340 in the fourth quarter of 2013 after which it began to reluctantly decline. It stood at 0.322 in the second quarter of 2016. This implies that the efforts by the Nigerian authority to reach more unbanked/under-banked in term of access is yielding the desired results as financial services are becoming increasingly available to the people. The problem however, lies with usage and services indicators. It is clear from the graphs that the two indicators are still lying at the base of the graphs. This is undoubtedly in tune with the reality of financial services in Nigeria. Although, more people are gaining access

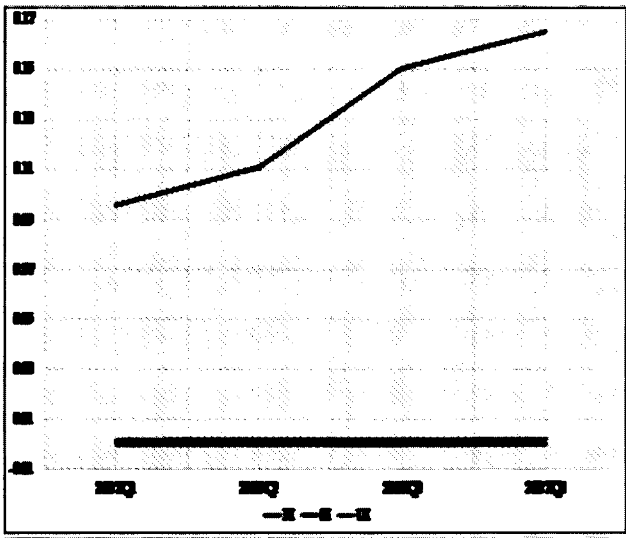

Fig. 3: Nigeria in a Three Dimensional Cartesian Space

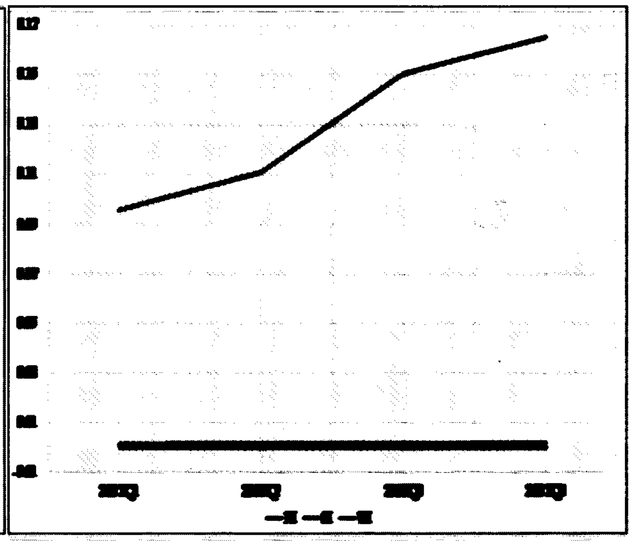

Fig.4: Nigeria in a Three Dimensional Cartesian

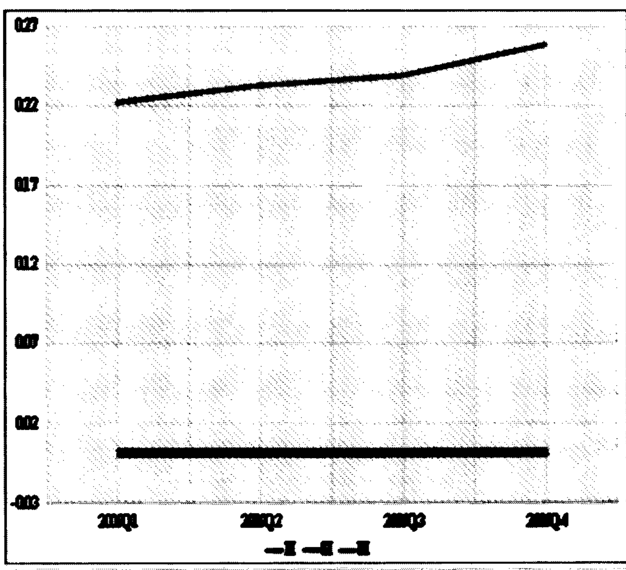

Fig. 5: Nigeria in a Three Dimensional Cartesian Space in 2009

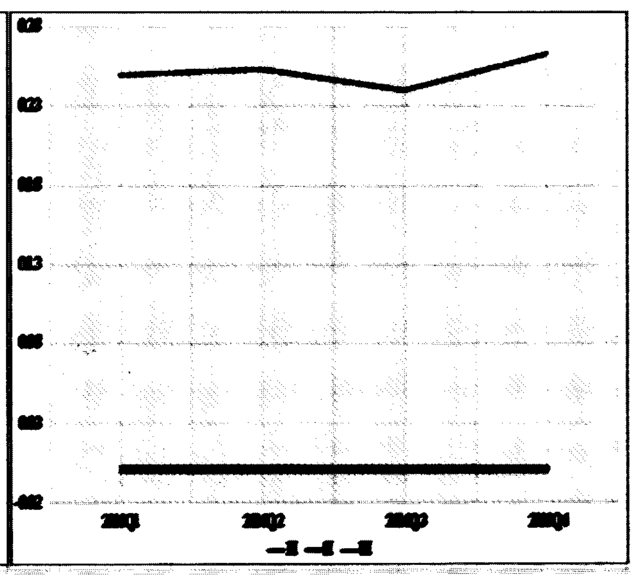

Fig. 6: Nigeria in a Three Dimensional Cartesian Space in 2010

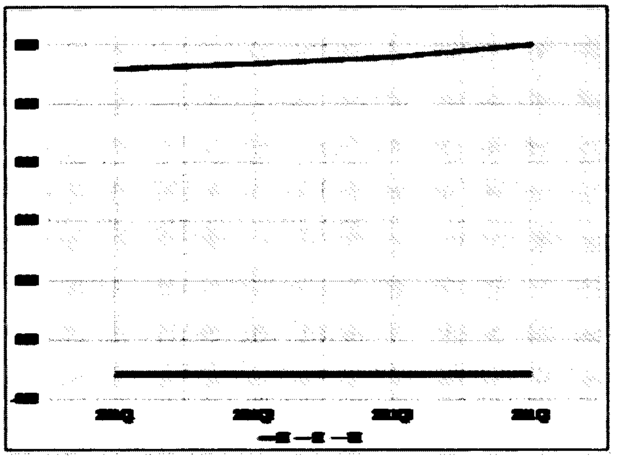

Fig. 7: Nigeria in a Three Dimensional Cartesian Space in 2011

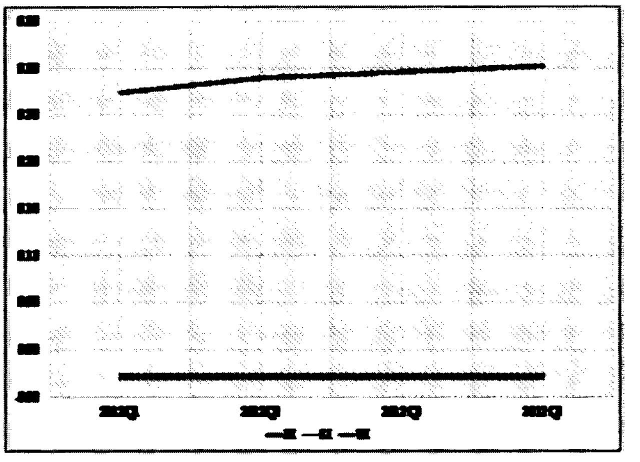

Fig. 8: Nigeria in a Three Dimensional Cartesian Space in 2012

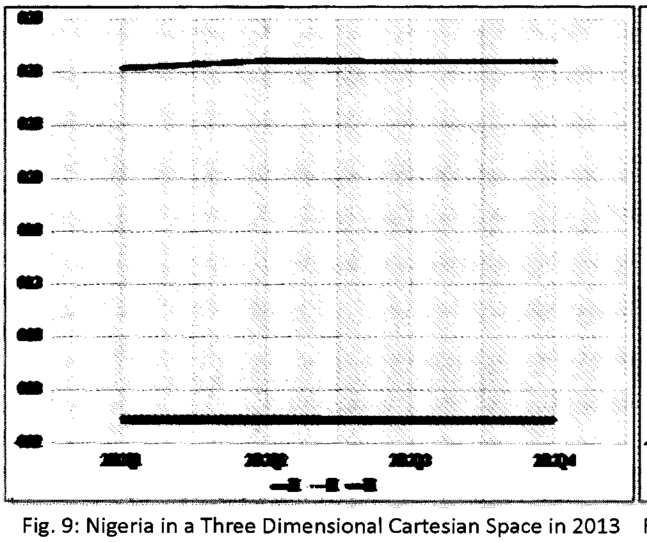

Fig. 9: Nigeria in a Three Dimensional Cartesian Space in 2013

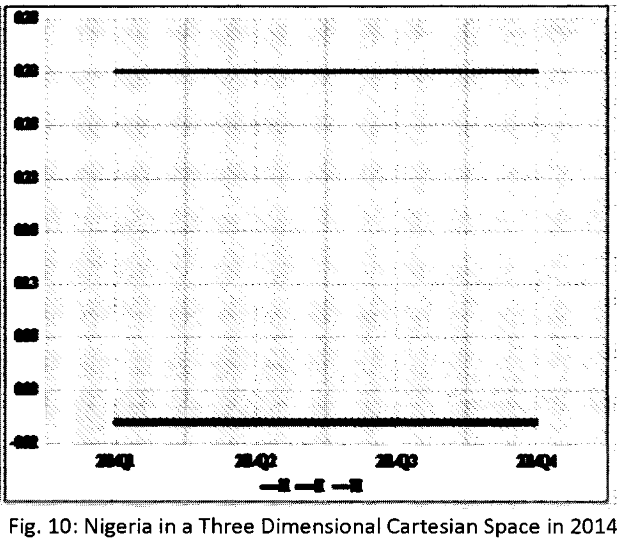

Fig. 10: Nigeria in a Three Dimensional Cartesian Space in 2014

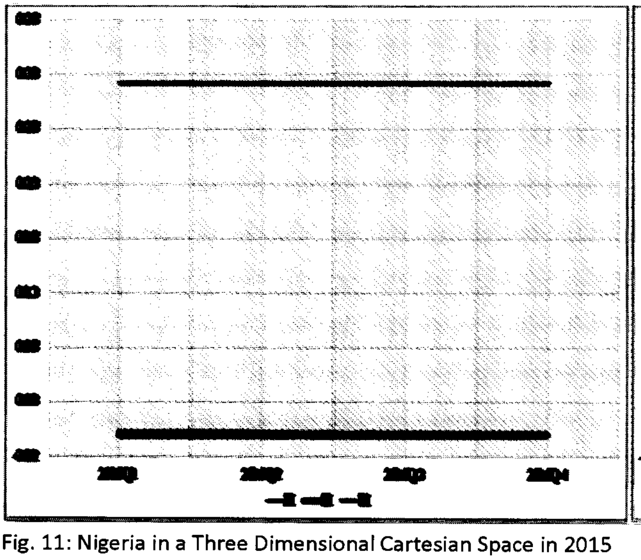

Fig. 11: Nigeria in a Three Dimensional Cartesian Space in 2015

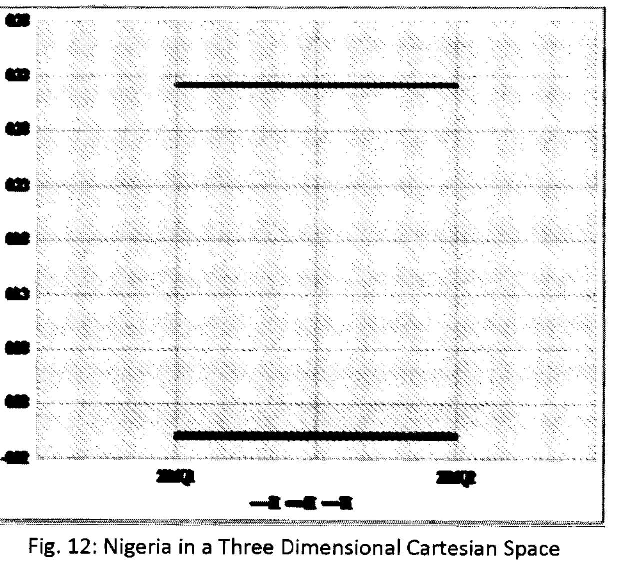

Fig. 12: Nigeria in a Three Dimensional Cartesian Space in the First Half or 2016

to financial services as the providers make frantic efforts to penetrate, but the usage of other services (such as credit facilities) are highly limited.

In other words, considering the Nigerian position in the 3-dimensional Cartesian space as portrayed by Figures 3 to 12, it is clear that the major driver of the Nigerian Financial inclusion is the penetration dimension, with pint-sized contributions from the services and usage dimensions. This can be interpreted to mean that effort is concentrated majorly on the penetration with little concern for services that are of immense benefit to the customers. In a plain language, the financial system quest for new/more bank accounts surpassed its effort at deposit mobilisation and credit creation with relative ease.

4.2 Practical Limitations

The ease of computation as well as the cross-country comparability of the resultant IFI as proposed by Sarma notwithstanding, there is a case of practical limitations that are worth noting. First is the paucity of data. Innovations in the financial system have become almost a daily affair, arising from the continued adoption of technology in financial transactions. Data on tele-banking, mobile banking and internet banking which are undeniably useful in computing IFI are not readily available. Second, the quality of available data, particularly, for other financial institutions such as Microfinance Banks(MFBs), Primary Mortgage Institutions (PMIs), Bank of Industry (BOI), Banks of Agriculture (BOA), etc. can hardly be vouched for. Third, for the purpose of the possibility of double counting, the picture of penetration index may not be perfect. A customer may have multiple account numbers, not only in one bank but also in other banks. This problem can however, largely be overcome if the CBN adopts Sarma's methodology in determining the progress in regards to her effort to attain the desired level of financial inclusion.

5 Concluding Remarks

The National Financial Inclusion Strategy of the Central Bank of Nigeria was designed to reduce the percentage of adult Nigerians excluded from financial services from 46.3 per cent as at 2010 to 20.0 per cent by 2020. As a component of the policy tool kit, the strategy makes provision for annual data gathering to monitor the progress in financial inclusion effort of the Bank. This approach and others recognised by the CBN are mostly survey based, hence occasional and expensive. There is therefore the strong need to device a means of monitoring progress in the financial inclusion drive of the country, in a relatively more frequent and cheaper way. This study is an effort to provide a comparatively more frequent and cheaper means of measuring progress in the financial inclusion in Nigeria.

In order to facilitate cross-country comparison, the study adopted Sarma (2008, 2012) methodology for computing an index of financial inclusion. The index has the capability of demonstrating the country's position in a three-dimensional Cartesian space, thus facilitate the understanding of the areas of laxity in the drive towards financial inclusion, thereby making it easy for policy makers to determine the next policy direction.

The results indicate that financial inclusion effort of the CBN is yielding the desired result particularly in term of penetration of financial service. The service and usage dimensions are however reported to have constituted the impediments to the planned accelerated attainment of the strategy. In other words, there is increase in coverage with limited access to the services rendered by these institutions that could be of immense benefit to the customers.

The study therefore, recommends that, CBN should not concentrate efforts on coverage of the percentage of adult Nigerians excluded from financial services alone, but also ensure that the customers benefit from financial services so as to enhance their participation in the developmental process. An inclusive financial system requires more than the size of the banked population, it includes the availability of banks services (such as credit facilities) and relative ease with which the services can be accessed.

References

CBN (2003): "Guidelines for Primary Mortgage Institutions," Other Financial Institutions Department, Central Bank of Nigeria, August 2003.

CBN (2016): "Financial Stability Report, June 2016.

Kama, U. & Adigun, M. (2013): "Financial Inclusion in Nigeria, Issues and Challenges", Central Bank of Nigeria Occasional Paper No. 45.

Sarma, M. (2008): "Index of Financial Inclusion", Indian Council for Research on International Economic Relations Working paper N. 215, 2008.

Sarma, M. (2012): "Index of Financial Inclusion - A Measure of Financial Sector Inclusiveness," Centre for International Trade and development, School of International Studies Working Paper Jawaharlal Nehru University. Delhi, India.

Udom, I. S., Umar S., Bamanga, M. A., Salihu A., Yaaba, B. N. & Ali, G. I. (2013): "Constructinga Financial Inclusion Index for Nigeria: A Supply Side Composite Approach," submitted for Publication in CBN Journal of Applied Statistics.