

Assessing Financial Inclusion Linkages in Nigeria: A Structural Vector Autoregressive Approach

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Abstract

This study examines the extent to which financial inclusion affects economic growth through the capital market in Nigeria. It employs structural vector autoregressive model to establish the transmission path of financial inclusion within the Nigerian economy using quarterly data from 1986Q1 to 2017Q4. Even though the results reaffirmed the significant and positive effect of financial inclusion on growth, it also reveals that the capital market is not a significant link in the growth process. It recommends that the synergy between capital market and deposit money banks be enhance by creating a legislative policy that would transform savings in these financial institutions to long term financial resources that would satisfy the financial needs of corporate firms, SMEs and individual investors.

Keywords: Capital Market, Financial Inclusion, Structural Vector Autoregressive Model

1. Introduction

The concept of financial inclusion as a catalyst capable of enhancing the rapid economic growth of nations as well as alleviating extreme poverty is universal and entrenched in economics literature (Bill & Melinda, 2015; Mastercard Foundation, 2014; World Bank, 2014). But the fact that literature has not established empirically, a transmission mechanism through which financial inclusion translates into economic growth is a major contending issue. Literature has, however, established a transmission link between capital market and economic growth (Fadun, 2018; Chauvet & Jacolin, 2015; Balami, 2015). In view of this, this study aims to examine the extent to which financial inclusion affects economic growth through the capital market especially in a developing economy like Nigeria.

This issue becomes more glaring in the face of mounting debates on whether financial inclusion does indeed enhances economic growth (Mader, 2016, 2017). considering the rush by countries (especially developing countries) to formulate and implement financial inclusion policies perceiving it as the magic

wand to achieving speedy economic growth and transformation (Marah, 2017; Kende-Robb, 2016; Central Bank of Nigeria [CBN], 2016, 2012).

Several developments within the Nigerian economy since it launched the National Financial Inclusion Strategy (NFIS) in 2012 warranted this investigation. Firstly, from 2012, when the NFIS was launched to 2015, the indicators of financial inclusion such as: penetration index, the usage index and, the service index all trended positively upwards. Nevertheless, the Nigerian economy went into recession in 2016. How could this have occurred when financial inclusion is supposed to enhance economic growth? Secondly, since the Sub-prime Financial Crisis of 2008, the Nigerian capital market witnessed massive disinvestments from both foreign and local institutional and individual investors. Why were earnings (savings) of financial inclusion not channeled to the real sectors of the economy through the capital market to finance economic activities and promote economic growth? These questions naturally resolved into a need to ascertain if there is a significant link between financial inclusion and capital market resulting to macroeconomic growth in Nigeria.

The novelty of this study hinges on three key contributions. Firstly, it underlies the absence of an empirical transmission link between financial inclusion and macroeconomic growth. Second, it established the absence of a significant linking financial intermediation between financial inclusion, the capital market and macroeconomic growth. third, it use a procedure designed for establishing contemporaneous relationship, the Structural Autoregressive(SVAR) Model pioneered by Sims (1986) ; Bernanke (1986),which to our knowledge is a first in a study of this nature.

The rest of the study is structures as follows: section 2 contains the literature review which embodies the conceptual review, the theoretical review and the empirical review. Section 3 contains the data and methodology, while section 4 is results and discussion, with the conclusion and policy recommendation presented in section 5.

2. Literature Review

There is an increasing perception of financial inclusion as a vehicle capable of enhancing the rapid economic transformation of nations as well as alleviating extreme poverty. It is a multidimensional concept that encompasses all initiatives, from both supply and demand sides, within the financial sector (United Nations, 2006); hence, there is no universally accepted definition of financial inclusion. For instance, Chakrabaty (2007) defined it as extending the benefits of banking to have-nots; while according to Sarma (2008), it implies the process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy; while the Central Bank of Nigeria [CBN] (2012)

defines it as, when adults have easy access to a broad range of formal financial services that meet their needs and are provided at affordable cost.

There are several reasons attached to having a financially inclusive economy: for micro-enterprises, it can provide funds for setting up and expansion and for improving risk-management; while on the macro-scale it can boost economic growth by mobilizing savings. It can also draw more firms into the formal sector, raising tax revenue and making workers eligible for better protection and benefits (FDCBimonth, 2016; Ningi & Dutse, 2008).

Intermediation is a fundamental function of a financial system and is performed by commercial banks and/or capital markets. An economy in need of new forms of financial intermediation to finance investments that are either long-term or too risky for commercial banks are one of the most important drivers of capital market growth (Leaven, 2001). The capital market provides equity or debt finance with long term maturities, while banks provide funds via short-term credit instruments (EMCompass, 2017).

According to Fadun (2018), the major instruments used to raise funds in the Nigerian capital market are: Debt, made up of Government bonds (Federal, State and Local); Industrial loans (debentures, stocks and bonds); and Equities (ordinary and preference share). Thus, the Nigerian capital market was experiencing an economic boom with a well capitalized banking sector (due to the N25 billion recapitalization exercise of 2004) and easy liquidity conditions, then comes the Global sub-prime Financial Crisis of mid-2007 which unleashed a torrent of economic dislocations. From September 2008, the financial crisis gained in depth and intensity, leading to massive disinvestments by local and foreign investors (Sere-Ejembi, 2008).

Due to the negative impact of the financial crisis on investments in the Nigerian economy, many firms registered on the capital market resorted to bank borrowing, thereby paying higher interest rates whereas with equity funding they would not pay such high sums. Most of those firms could not raise cheaper funds from the capital market due to low levels of investments, liquidity constraints and shallow depth of the market which kept it bearish for the most part (Kurfi, 2017; Oke & Ajayi, 2012).

Economic growth is a vital indicator of the state of an economy. As a country's gross domestic product (GDP) is increasing, it becomes more productive resulting in high employment rates and increases the wealth of the country and its population. Investments in physical capital and infrastructure are few of several factors needed to boost the economic growth of a country. If the economy is producing more, businesses are more profitable and stock prices rise, increasing the availability of long term funds for firms to access, hire more labour and boost output (Agarwal, 2017; Udechukwu, 2003). It is therefore vital that, easy access to financial services be provided to farmers in rural areas, because formal financial

institutions avoided such communities due to high overhead costs and several other reasons (Thorat, 2008).

As such, this work is conceptualized on the existence of a bidirectional relationship between financial inclusion, capital market and economic growth within an economy. It consists of short term flows of financial resources from an inclusive financial system to the productive sectors. These funds are characterized by short term amortization periods, high interest rates and relatively volatile, thus producing an insignificant effect on growth (principal to the query on whether financial inclusion does enhance economic growth). Whereas, the financial flows from an inclusive financial system to the productive sectors via the capital market (if it exist and the focus of this study) will enhance the flow of long-term financial resources, resulting in significant growth processes in the economy.

2.1 Empirical Review

While there are several studies on financial inclusion and economic growth, as well as on capital market and economic growth, there is however, sparse literature on the contemporaneous interactions of all three variables and their effect(s) on each other within an economy. For instance, in a previous study that uses annual time lags to study the effect of financial inclusion, capital market and economic growth for the period 1986 to 2017, Migap and Ajegi (2018) employed a VAR model with annual data to show a reverse causality from economic growth to capital market and financial inclusion.

Employing historical analysis and drawing on the need of India and other countries, Sastry (2017) wrote on financial inclusion in capital markets, analyzing the challenges and opportunities for cooperatives. The study emphasized that the poor have been recipients of loans and explores the possibility of including them not only as customers for loans, but also as owners or shareholders and participants in the capital market. The study recommends that the poor primary producers (farmers, fishermen, animal husbandry and poultry) should contribute share capital in different forms to set up cooperatives that can enable them increase their incomes by participating in capital market.

Using a multiple regression model, Iqbal and Sami (2017) assessed the role of banks in financial inclusion of India from 2007 to 2014. The result revealed a positive and significant impact of number of bank branch and credit deposit ratio on GDP of the country. The data points used in the study is too small for a time series analysis, and as such the results could not be relied on for any meaningful policy.

Ajmair, Hussain, Abassi and Bhutta (2017) employed a SVAR model to assess the determinants of economic growth in Pakistan for the period 1976 to 2014. The findings reveal that remittances, gross national expenditures and inflation are positive and significant determinants of economic growth.

With a study focused on examining the relationship between stock market performance and economic growth of the Philippines from 1990 to 2011, Sobrecart, Sucuahi and Tamayo (2015) utilized Granger causality test to indicate that market capitalization and the value of shares traded has no significant relationship with economic growth. Some of the weakness of this study is the time frame of the study which is inadequate to provide robust result base on time series analysis. It is also observed that the authors failed to make any recommendation based on the outcome of their study. The strength of this study lies in its ability to highlight that economic growth for most developing does not necessarily flow from stock market performance.

Raymond (2014) investigates the contributions of capital market and financial deepening to economic growth in Nigeria from 1981 to 2012, using least squares multiple regression method. The result revealed that market capitalization, narrow money diversification and interest rate significantly affected economic growth during the study period. The study is commendable for its effort to incorporate 3 variables in an attempt to analyze the issue of capital market, financial development and economic growth in Nigeria. However, it suffers from methodological deficiencies, such as least squares multiple regression when the variables are integrated of $I(1)$. In addition, using the Johansen cointegration test, when the model is clearly not a system of equation is faulty. The recommendation to stakeholders is vague as it is not targeted at any specific institution or organization, thus not implementable.

In a similar study of the Nigerian economy, Osuala, Okereke and Nwansi (2013) examines the causal relationship between stock market performance and economic growth, using an Autoregressive Distributed Lag (ARDL) model/bound testing approach for the period 1981 to 2011. While the study finds evidence of long run cointegration between economic growth and stock market performance, it revealed unidirectional causality in the short run between economic growth and stock market performance. The study failed to pinpoint the specific policy measures that would need to be implemented to “rekindle the dwindling interest and confidence of both domestic and foreign investors in the market”, moreover the issue of market integrity is unsubstantiated and un-measurable.

Mbutor and Uba (2013) studied the impact of financial inclusion on monetary policy in Nigeria (1980 to 2012). The results supports the notion that financial inclusion improves the effectiveness of monetary policy which in turn has tremendous impact on capital market activities. The study contained some basic defects of analysis such as unilaterally entering all the variables in the model as $I(1)$ thereby performing Johansen co-integration test immediately, whereas, the variables were a combination of $I(0)$ and $I(1)$, warranting the usage of bound testing before proceeding to test for the long run relationship. As such the result is not reliable.

Culha (2006) examines the determinants of capital flows into Turkey in the traditional push-pull factors approach using SVAR model for the period 1992:01 to 2005:12. Employing IRF and FEVD analysis, the evidence suggests that pull factors are in general dominant over the push factors in determining capital flows into Turkey. The study is commendable for utilizing SVAR in its analysis, thereby imposing restrictions on the variables that conform to their behavior in the Turkish economy. The only drawback is its inability to determine the magnitude (coefficient) of the effect each of the pull factors had in determining capital flows into Turkey.

In a study on how to strengthen banks and develop capital markets, Kuroda (2002) opined that since the role of banks in supplying long term capital may be limited, banks could extend loans in the form of project finance, and then factorize and securitized the loans, which could be sold to other financial organizations and investors through the capital market. However, the paper is limited by a lack of quantitative analysis to give a verifiable bend to the suggested conclusions.

3. Methodology

For the purpose of identifying the transmission path, the study adopts the financial intermediation theory of Gurley and Shaw (1960); and Allen's (1993) institutional theory of capital market development. It employed the SVAR model of Amisano and Giannini (1997). For this study, we specified a six variable SVAR model based on the same restrictions as Culha (2006) and Ajmair et al (2017) with certain modifications in line with the objective of the study and the peculiarities of the Nigerian economy.

The SVAR model is preferred because it overcomes the problem of arbitrary impositions of restrictions as found in a VAR model. The restrictions imposed by SVAR models are usually based on economic theory, past empirics or well documented observations. It also estimates the contemporaneous effect among variables, which is the effect of their current period on each other.

The SVAR model is presented as:

$$Y_t = (PeI, MC, GDP, LSME, LR, ER) \quad (1)$$

Where:

PeI= Penetration index (proxy for Financial Inclusion).

MC=market capitalization (proxy for Capital market).

GDP= real gross domestic product (proxy for Economic Growth).

Also included in the SVAR system are macroeconomic variables that are important for the capital market, financial inclusion and economic growth. These are:

LSME=loan to SME (proxy for credit channel).

LR=lending rate (proxy for interest rate channel).

ER= Dollar/naira exchange rate (proxy for exchange rate channel).

The variables (except LR) are estimated taking their logarithms, allowing them to be interpreted as elasticities and minimizing heteroscedasticity (Chiu, 2017). Using conventional notation (ignoring constant intercepts), the six-variable structural system of our SVAR model is presented as:

$$er_t = \theta_{11}^1 er_{t-1} + \theta_{12}^1 lr_{t-1} + \theta_{13}^1 lsme_{t-1} + \theta_{14}^1 pei_{t-1} + \theta_{15}^1 mc_{t-1} + \theta_{16}^1 gdp_{t-1} + \theta_{12}^0 lr_t + \theta_{13}^0 lsme_t + \theta_{14}^0 pei_t + \theta_{15}^0 mc_t + \theta_{16}^0 gdp_t + \varepsilon_{1t} \quad (2)$$

$$lr_t = \theta_{21}^1 er_{t-1} + \theta_{22}^1 lr_{t-1} + \theta_{23}^1 lsme_{t-1} + \theta_{24}^1 pei_{t-1} + \theta_{25}^1 mc_{t-1} + \theta_{26}^1 gdp_{t-1} + \theta_{21}^0 er_t + \theta_{23}^0 lsme_t + \theta_{24}^0 pei_t + \theta_{25}^0 mc_t + \theta_{26}^0 gdp_t + \varepsilon_{2t} \quad (3)$$

$$lsme_t = \theta_{31}^1 er_{t-1} + \theta_{32}^1 lr_{t-1} + \theta_{33}^1 lsme_{t-1} + \theta_{34}^1 pei_{t-1} + \theta_{35}^1 mc_{t-1} + \theta_{36}^1 gdp_{t-1} + \theta_{31}^0 er_t + \theta_{32}^0 lr_t + \theta_{34}^0 pei_t + \theta_{35}^0 mc_t + \theta_{36}^0 gdp_t + \varepsilon_{3t} \quad (4)$$

$$pei_t = \theta_{41}^1 er_{t-1} + \theta_{42}^1 lr_{t-1} + \theta_{43}^1 lsme_{t-1} + \theta_{44}^1 pei_{t-1} + \theta_{45}^1 mc_{t-1} + \theta_{46}^1 gdp_{t-1} + \theta_{41}^0 er_t + \theta_{42}^0 lr_t + \theta_{43}^0 lsme_t + \theta_{45}^0 mc_t + \theta_{46}^0 gdp_t + \varepsilon_{4t} \quad (5)$$

$$mc_t = \theta_{51}^1 er_{t-1} + \theta_{52}^1 lr_{t-1} + \theta_{53}^1 lsme_{t-1} + \theta_{54}^1 pei_{t-1} + \theta_{55}^1 mc_{t-1} + \theta_{56}^1 gdp_{t-1} + \theta_{51}^0 er_t + \theta_{52}^0 lr_t + \theta_{53}^0 lsme_t + \theta_{54}^0 pei_t + \theta_{56}^0 gdp_t + \varepsilon_{5t} \quad (6)$$

$$gdp_t = \theta_{61}^1 er_{t-1} + \theta_{62}^1 lr_{t-1} + \theta_{63}^1 lsme_{t-1} + \theta_{64}^1 pei_{t-1} + \theta_{65}^1 mc_{t-1} + \theta_{66}^1 gdp_{t-1} + \theta_{61}^0 er_t + \theta_{62}^0 lr_t + \theta_{63}^0 lsme_t + \theta_{64}^0 pei_t + \theta_{65}^0 mc_t + \theta_{66}^0 gdp_t + \varepsilon_{6t} \quad (7)$$

And in matrix notation this model could be specified as:

$$A_0 Y_t = A_1 Y_{t-1} + \varepsilon_t \quad (8)$$

$$\begin{bmatrix} 1 & -\theta_{12}^0 & -\theta_{13}^0 & -\theta_{14}^0 & -\theta_{15}^0 & -\theta_{16}^0 \\ -\theta_{21}^0 & 1 & -\theta_{23}^0 & -\theta_{24}^0 & -\theta_{25}^0 & -\theta_{26}^0 \\ -\theta_{31}^0 & -\theta_{32}^0 & 1 & -\theta_{34}^0 & -\theta_{35}^0 & -\theta_{36}^0 \\ -\theta_{41}^0 & -\theta_{42}^0 & -\theta_{43}^0 & 1 & -\theta_{45}^0 & -\theta_{46}^0 \\ -\theta_{51}^0 & -\theta_{52}^0 & -\theta_{53}^0 & -\theta_{54}^0 & 1 & -\theta_{56}^0 \\ -\theta_{61}^0 & -\theta_{62}^0 & -\theta_{63}^0 & -\theta_{64}^0 & -\theta_{65}^0 & 1 \end{bmatrix} \begin{bmatrix} er_t \\ lr_t \\ lsme_t \\ pei_t \\ mc_t \\ gdp_t \end{bmatrix} = \begin{bmatrix} \theta_{11}^1 & \theta_{12}^1 & \theta_{13}^1 & \theta_{14}^1 & \theta_{15}^1 & \theta_{16}^1 \\ \theta_{21}^1 & \theta_{22}^1 & \theta_{23}^1 & \theta_{24}^1 & \theta_{25}^1 & \theta_{26}^1 \\ \theta_{31}^1 & \theta_{32}^1 & \theta_{33}^1 & \theta_{34}^1 & \theta_{35}^1 & \theta_{36}^1 \\ \theta_{41}^1 & \theta_{42}^1 & \theta_{43}^1 & \theta_{44}^1 & \theta_{45}^1 & \theta_{46}^1 \\ \theta_{51}^1 & \theta_{52}^1 & \theta_{53}^1 & \theta_{54}^1 & \theta_{55}^1 & \theta_{56}^1 \\ \theta_{61}^1 & \theta_{62}^1 & \theta_{63}^1 & \theta_{64}^1 & \theta_{65}^1 & \theta_{66}^1 \end{bmatrix} \begin{bmatrix} er_{t-1} \\ lr_{t-1} \\ lsme_{t-1} \\ pei_{t-1} \\ mc_{t-1} \\ gdp_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t}^{er} \\ \varepsilon_{2t}^{lr} \\ \varepsilon_{3t}^{lsme} \\ \varepsilon_{4t}^{pei} \\ \varepsilon_{5t}^{mc} \\ \varepsilon_{6t}^{gdp} \end{bmatrix}$$

$$\text{i. e. } A_0 Y_t = A_1 Y_{t-1} + \varepsilon_t$$

In this study, the model assumes a recursive structure in the restrictions on the contemporaneous relations in the variables base on economic theory, past empirics and features peculiar to the Nigerian economy. Therefore the following assumptions have been made regarding the long run structural shocks; firstly, the exchange rate equation is not expected to be contemporaneously affected by shocks from any other macroeconomic variables in the system. With Nigeria been an import dependent country, It is also assumed that other domestic macroeconomic variables do not affect the dollar/naira exchange rate contemporaneously.

This assumption leads to the restrictions: $a_{12}(L) = a_{13}(L) = a_{14}(L) = a_{15}(L) = a_{16}(L) = 0$.

Secondly, the lending rate equation is contemporaneously affected by the shock of the exchange rate. Shocks from other variables in the system are not expected to influence the lending rate instantaneously. This restriction is incorporated as: $a_{23}(L) = a_{24}(L) = a_{25}(L) = a_{26}(L) = 0$

Thirdly, the third equation is the loans to SMEs and is contemporaneously influenced by the shocks of exchange and interest rate variables, which yields the restrictions: $a_{34}(L) = a_{35}(L) = a_{36}(L) = 0$

Fourthly, the financial inclusion equation is expected to be contemporaneously affected by shocks from exchange rate, lending rate and loans to SMEs. Because, in Nigeria these variables are perceived to influence domestic savings, which leads to the restrictions: $a_{45}(L) = a_{46}(L) = 0$

Fifthly, exchange rate is expected to influence the capital market (MC) equation spontaneously. This is because foreign individual and institutional investors are major players in the Nigerian capital market. Interest rate, loan to SMEs and Pei are expected to influence MC contemporaneously, due to their pervasive influence on capital market. This restriction is introduced as: $a_{56}(L) = 0$

Finally, economic growth is expected to be contemporaneously affected by shocks from all the variables in the system. Thus, shocks to all other variables are assumed to affect economic growth in the long-run; hence it is determined endogenously in the system.

Thus, taking the theoretical restrictions on exchange rate(er), lending rate(lr), loan to SME (lsme), penetration index(pei), market capitalization(mc) and gross domestic product(gdp) into consideration, the SVAR system(in compact form), of the contemporaneous relationship among the variables can be written in matrix form as: $A_0 e = B \epsilon_t$

(9)

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 \end{bmatrix} \begin{bmatrix} \epsilon_t^{er} \\ \epsilon_t^{lr} \\ \epsilon_t^{lsme} \\ \epsilon_t^{pei} \\ \epsilon_t^{mc} \\ \epsilon_t^{gdp} \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & b_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & b_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & b_{66} \end{bmatrix} \begin{bmatrix} \epsilon_t^{er} \\ \epsilon_t^{lr} \\ \epsilon_t^{lsme} \\ \epsilon_t^{pei} \\ \epsilon_t^{mc} \\ \epsilon_t^{gdp} \end{bmatrix}$$

$$A_0 e = B \epsilon_t$$

The coefficients in the matrix A_0 give the contemporaneous relationships between variables. The coefficients in the main diagonal of the B matrix give estimates of standard deviations of the structural shocks. The structural disturbances (ϵ_t) stand for the shocks of exchange rate (ϵ_t^{er}), maximum lending rate (ϵ_t^{lr}), loans to SMEs (ϵ_t^{lsme}), penetration index (ϵ_t^{pei}), market capitalization (ϵ_t^{mc}), and real gdp (ϵ_t^{gdp}). The residuals of reduced form (et) on the left

hand side can be interpreted as unexpected movement of variables in the system (Amisano & Gianni, 1997).

4. Results and Discussion

Table 1: Descriptive Statistics

Statistic	GDP	MC	PEI	LR	ER	LSME
Mean	495250.5	5311.431	78.26366	23.19312	102.8895	101.6023
Median	98.06505	694.7531	7.439910	22.48500	115.0785	40.55281
Maximum	783584	24242.80	2064.377	37.37813	323.0865	1641.663
Minimum	32.67535	6.362500	0.1928102	7.375000	0.525702	8.414688
Std.Dev.	903804.7	6953.083	268.3428	4.812865	73.22490	270.9146
Skewness	1.388441	0.994636	5.501178	0.418340	0.524663	4.889853
Kurtosis	3.188293	2.493529	35.30439	4.193739	3.359273	26.40450
Jarque-Bera	41.31479	22.47315	6211.335	11.33357	6.560864	3431.538
Probability	0.000000	0.000013	0.000000	0.003459	0.037612	0.000000
Sum	63392068	679863.2	10017.75	2968.720	13169.86	13005.09
Sum sq.Dev	1.04E+14	6.14E+09	9144997	2941.786	680959.6	9321132
observations	128	128	128	128	128	128

Source: Author's Computation Eviews 10, 2020.

Table 1 indicates that, the penetration index (PEI) revealed a mean of 78.2637 bank accounts per 100,000 adults, with maximum and minimum values of 2064.377 and 0.193 account holders per 100,000 adults (indicating the highest and lowest number of persons with access to financial services out of 100,000 adults at any particular time and place). The standard deviation (268.343) shows the index is widely dispersed; and the Jarque-Berra test indicate the index is not normally distributed. Other columns in the table could be similarly interpreted.

Table 2: Results of Unit Root Test Using ADF, PP and KPSS

ADF Test				PP Test			KPSS Test		
Variables	Level	First Diff.	(d)	Level	First Diff.	(d)	Level	First Diff.	(d)
LnGDP (Intercept)	- 0.652642 (0.8535)	-13.30168 (0.0000)**	I(1)	- 0.387750 (0.9067)	-13.36861 (0.0000)**	I(1)	1.024778*** (0.463000)	0.152058 (0.463000)	I(1)
LnMC (Intercept)	- 1.577297 (0.4910)	-3.429848 (0.0118)**	I(1)	- 1.300299 (0.6281)	-5.867950 (0.0000)**	I(1)	1.354423 (0.463000)**	0.189157 (0.463000)	I(1)
LnPeI (Intercept)	0.362207 (0.9805)	-4.667770 (0.0002)***	I(1)	0.600441 (0.9893)	-7.800690 (0.0000)***	I(1)	1.394875** (0.463000)	0.136675 (0.1463000)	I(1)
LR (Intercept)	- 2.252850 (0.1891)	-3.087010 (0.0091)**	I(1)	- 5.170517 (0.0000)		I(0)	0.158394 (0.463000)		I(0)
LnER	- 1.896909 (0.3328)	-3.519879 (0.0091)**	I(1)	- 5.170517 (0.0000)		I(0)	1.161636 (0.463000)**	0.184325 (0.216000)	I(1)
LnLSME	- 3.060754 (0.0322)		I(0)	- 2.441337 (0.1326)	-9.419864 (0.0000)**	I(1)	0.178798 (0.463000)		I(0)

**denotes rejection of the null hypothesis at the 5% level. Critical values at 0.05 are in parenthesis.

Source: Author's Computation Eviews 10, 2020.

Results of the unit root tests are presented in Table 2. It indicates that while some variables are stationary at levels I (0), others are stationary at first difference I (1). It indicates that only lending rate (LR), and loans to SMEs (LSME) are stationary at levels. Stationarity at levels implies that the effect of a shock on the variable under consideration is only temporary and the system will revert back to equilibrium after a time lag; while the effects of a shock on non-stationary variables is long lasting.

Table 3: Bayer-Hanck Test for Cointegration

Estimated model:(lnmc, lnpei, lngdp, lner, lr, lnlsme)				
	Engel-Granger	Johansen	Banerjee	Boswijk
p-values	0.9831	0.0000	0.9760	0.5924
Test Statistics	-1.8545	67.0431	-0.6643	11.1555
Fisher Type Test statistic, Bayer Hanck test.lag(10)				
EG-J: 55.296131, 5%				
critical value:10.419				
EG-J-Ba-Bo: 56.391863, 5%				
critical value: 19.888				

Source: Authors' Computation, Stata/SE 14.2, 2020

The Bayer and Hanck cointegration result shown in Table 3 indicates that the hypothesis of co cointegration is rejected at 5% significance, thus suggesting the existence of a long run relationship between the variables. The study adopts a lag length of 10 quarters specified by the Akaike Information criterion (AIC), as indicated by the lag order selection test, because it performs better for smaller samples.

Table 4: Structural VAR Estimates

6 variable SVAR with K=10						
	lnEX	LR	lnLSME	lnPeI	lnMC	lnGDP
A =	1	0	0	0	0	0
	-7.243726 (0.0069)**	1	0	0	0	0
	-0.976724 (0.4321)	-0.107697 (0.0093)**	1	0	0	0
	-0.016171	-0.062600	0.056184	1	0	0

	(0.9798) -0.647067 (0.0084)** -0.715568 (0.8247)	(0.0040)** 0.019648 (0.0235)* -0.041146 (0.716)	(0.2324) -0.012696 (0.4864) 0.642732 (0.0060)**	-0.098219 (0.0056)** 1.721596 (0.0002)**	1 0.385592 (0.7432)	0 1
B =	lnEr	LR	lnLSME	lnPeI	lnMC	lnGDP
	b ₁₁	b ₂₁	b ₃₁	b ₄₁	b ₅₁	b ₆₁
	0.026908 (0.0000)**	0.784141 (0.0000)**	0.352713 (0.0000)**	0.180260 (0.0000)**	0.069471 (0.0000)**	0.888251 (0.0000)**
Log likelihood		104.5058				

**denotes rejection of the null hypothesis at the 5% level. Critical values at 0.05 are in parenthesis.

Source: Author's Computation Eviews 10, 2020.

The SVAR estimates are presented in Table 4. The principal diagonal shows the response of each variable to own shock. The first column revealed that only lending rate (LR) and market capitalization responds contemporaneously and significantly to the dollar/naira exchange rate. Other variables in the model have insignificant contemporaneous responses to the exchange rate. The result suggest that a percentage increase in the exchange rate reduces MC by 0.65%. This outcome is expected as an appreciated naira increases the value of naira denominated securities, making them less attractive/affordable to foreign investors, thereby lowering the market value of traded securities.

The fourth column indicate that both market capitalization(MC) and economic growth(GDP) respond contemporaneously and significantly (but in opposite direction) to financial inclusion(PEI). The result suggest that a percentage increase in financial inclusion leads to 0.098% decrease in market capitalization. This is an indication that the link between financial inclusion and capital market in Nigeria is not complementary and has only marginal effect. This outcome is contrary to economic expectation as both institutions are supposed to complement each other (Kuroda, 2002). The result, however, reveal that a percentage increase in financial inclusion increases economic growth by 1.72%. This is in line with economic expectation and corroborated by findings of several studies such as the study by Mbutor and Uba (2013).

The fifth column reveals that there is a positive but insignificant contemporaneous relationship between GDP and MC. This outcome is not entirely unexpected because innovation in MC might be due to changes in prices of financial assets and not translate into a real change in an economy's output; even though studies such as Nazir, et al, (2010) posit a positive and significant relationship between GDP and MC. The lower portion of Matrix B contains the results of the structural shocks of the variables in the model. The result indicates that all the shocks are independent and significant at 5%.

The first column shows that only 0.027% of the innovations in exchange rate (EX) are due to own shocks. It infers that almost all (99%) of the disturbances to EX are caused by other variables in the model. This suggests that changes in the exchange rate would be best controlled by monitoring these other variables than the exchange rate itself. The fourth column has a value of 0.18% an indication that the penetration index of financial inclusion accounts for only a tiny portion of the innovation in itself. It implies that shocks to financial inclusion are best controlled by monitoring the influences of other variables specified in the model, rather than the index itself. Similarly, with a value of 0.069%, the fifth column of matrix B reveals that innovations to capital market are mostly driven by the influences of other variables specified in the model, rather than by its own shocks. The last column has a value of 0.888% which signifies that a significant portion of the innovations in economic growth are self-driven. Thus, shocks to GDP could be reasonably controlled by monitoring its fluctuations.

5. Conclusion and Policy Recommendations

This study analyze whether the capital market is a proximate cause of growth in the financial inclusion economic growth nexus, by ascertaining if it is a transmission mechanism in the relationship. Results from the SVAR analysis reveal a significant but negative contemporaneous relationship between financial inclusion and capital market. This is in consonance with the view of several studies (Kurfi, 2017; Oke and Ajayi, 2012) which concluded that, the Nigerian capital market has not performed satisfactorily its task of mobilizing financial resources for long term capital formation, due to its shallow depth and liquidity constraints. The result also reaffirmed the financial inclusion-growth nexus by revealing a positive and significant contemporaneous relationship between financial inclusion and economic growth.

Thus, this study has established that financial inclusion does indeed enhance economic growth, though; the capital market is not a significant link in this growth process within the Nigerian economy. The implication is that, financial inclusion does not enhance long term economic growth, since the institution (capital market) largely saddled with the responsibility of providing long term finance is not positively affected by extending access to financial services to the general public, as such, funds mobilized by financial inclusion are not accessible to the capital market for onward transmission to the real sectors of the economy.

Given the findings and conclusion drawn from this study, it is recommended that:

- i. Since direct financing through the capital market is not a rapid and common option at this stage due to its un-development, the role of capital market can still be significant in enhancing growth if government could strengthened the relevant institutions that would protect and boost investor confidence.

- ii. Since financial inclusion is a process undertaken by deposit money banks, the capability of Nigerian banks to supply long term finance should be enhanced. This could be achieved through legislation as a temporary measure (while the capital market matures).
- iii. Given that bank loans are the most preferred form of funding due to the small size and transparency issues in the capital market, banks could still assist the market to develop by inventing new forms of packaging loans into securities that could be traded in the capital market.
- iv. The listing requirements for the Second Tier Securities Market (1985) for small and medium enterprises (small investors) should be made less stringent and the activities of the market should be given more priority and awareness than is presently the case to encourage participation by SMEs and small investors.

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