Financial Inclusion, Governance and Welfare Analysis in Nigeria

Joseph A. Omojolaibi
Department of Economics, University of Lagos, Akoka, Lagos, Nigeria

Abstract

Some of the macroeconomic challenges inherent in the Nigerian economy are poverty and income inequality. For sustainable and inclusive growth, the crucial elements of financial inclusion and transparent democratic practice need to be put into consideration. This study enquired empirically the impact of financial inclusion and governance characteristics on welfare in Nigeria through three key channels: investment in infrastructure, per capita GDP and income inequality. The data covered the period 1980-2014, while the study relied on the Generalised Method of Moment (GMM) estimation technique for the analysis. It was discovered that financial inclusion and governance indices have statistical relevance in determining infrastructural investment in Nigeria. The result also showed that governance indices and commercial bank deposit significantly increase per capita GDP; and that financial inclusion has the tendency to bridge the gap between the rich and the poor and reduce the prevalence of poverty in the economy. The findings suggested that to reduce income inequality and increase per capita GDP, more measures must be taken to address financial exclusion of low-income groups from financial services; and that transparent democratic practice that will stimulate investment in infrastructure and enhance per capita GDP should be instituted in Nigeria.

Keyword: Financial inclusion, poverty, income inequality, Economic progress
JEL Classification: E02, E44, F63

Introduction

Financial inclusion is the process that guarantees the ease of accessibility, availability, and affordability of formal financial services for all members of an economy (Sarma, 2008). However, it is also imperative to distinguish between voluntary versus involuntary exclusion. The World Bank (2014) defines voluntary exclusion as a condition where the segment of the population or firms choose not to use financial services either because they have no need for them or

due to cultural or religious reasons. In contrast, involuntary exclusion arises from insufficient income and high risk profile or due to discrimination and market failures and imperfections. Policy and research initiatives must then focus on involuntary exclusion as it can be addressed by appropriate economic programmes and policies, which can be designed to increase income levels, reduce poverty, bridge income inequality gap and correct market failures and imperfections.

In 2012, Nigeria launched the National Financial Inclusion Strategy (NFIS) and promoted it as a key driver in becoming one of the world's largest economies. The goal of NFIS is to reduce the number of Nigerians without access to financial services from 46.3% to 20% by 2020. These developments present an exciting opportunity for female entrepreneurs, especially, to participate in the banking system. Despite being Africa's largest economy, only 30% of Nigerian adults have an account at a formal banking institution. Currently, more women are excluded than men, with about 73% of them holding no account (Njideka, 2014).

Although financial inclusion and governance have become topical on the global policy agenda for sustainable development, economic literature on financial inclusion-governance nexus, especially in developing economies, is still in its infancy. Most studies have looked into the appropriate measures of financial inclusion, both at household and country levels, while some papers focused on the role of financial access in lowering poverty and income inequality. Others have dealt with varying levels of financial inclusion and institutional structure both in advanced and emerging economies. However, a few works have painstakingly examined the interactions of financial inclusion and governance indicators on the welfare of the poor (eg, Kaufmann et al., 2000 and Acemoglu et al., 2005). The current study, therefore, fills this lacuna by providing key pro-poor policy insights in the transmission mechanism of financial inclusion and governance on welfare through the lens of investment in infrastructure, per capita GDP and income inequality in Nigeria.

Following the financial inclusion and governance indicators, the study tests the significance of financial inclusion and governance in reducing poverty in Nigeria. It asks the following questions: Do financial access and governance structure influence investment in infrastructure, per capita GDP and income inequality in Nigeria? Does economic progress lead to poverty reduction in Nigeria? The report is organized into five sections. Section 2 comprises the background of the study in relation to financial inclusion and governance, as well as the branches of financial inclusion in Nigeria. The review of relevant literature

and estimation strategy, and specification of the models and data are contained in section 3 and 4 respectively. The empirical findings and interpretation of results are discussed in section 5, while section 6 is the conclusion.

Current empirical enquiries pronounce that financial inclusion has been notably apparent in Nigeria with the huge amount of the capital in the country residing externally of the banking system. The subjects of financial inclusion and governance have therefore been an issue to the Nigerian government that has received the attention of private individuals and government agencies mutually from within and outside the country (CBN, 2014). Preceding the recent efforts to promote financial inclusion, the Nigerian economy was principally a cash-based economy, with significant proportion of the narrow money stock in the form of currency outside the banking system. Though the average ratio of the currency outside the banking sector to narrow money supply fell from 61.1% in the 1960s to about 44.3% in the 1970s and later trended downward to 40.9% in the 1980s, the decline was linked to a combination of developments, such as increased literacy and government policies directed towards encouraging financial sector growth. The Central Bank of Nigeria (CBN) during this period initiated a rural banking programme directing banks to open branches in the rural areas, thus encouraging Nigerians to utilise financial institutions and products more (CBN, 2013).

Nonetheless, the crisis in the banking industry during the 1990s eroded the confidence of the populace in the country to utilise banking services. This problem became worsened due to the excessive spending of the political elites that led to the increase in the level of currency outside the banking system. During this period, the ratio of currency outside the banking system increased to 47.7% by the end of the 1990s. To ameliorate the damaging impact of the banking industry's distress during this period, the government implemented several policies that were not only meant to improve the general wellbeing of the populace in terms of employment generation and income earning capacity but also geared towards increasing the deepening of the financial sector. An example of such economic reform was the bank consolidation programme of 2004. This measure stimulated the use of financial services in order to reduce the ratio of currency outside the banking system to about 38% by the end of 2005 (CBN, 2013).

The Nigerian financial services have witnessed accelerated activities by both the government and regulatory authorities aimed at deliberately promoting policies that are intended to grow financial inclusion ever since 2005. Examples of such policies are: the Financial System Strategy 2020 (FSS 2020),

microfinance policy, non-interest banking, e-banking products, electronic payment system and cashless (cashlite) policy.

An investigation by the Enhancing Financial Innovation and Access (EFInA) in 2010 confirmed that only 30.7 of the 85 million Nigerians above the age of eighteen had access to formal financial services (services from deposit money banks and other formal institutions), leaving out over 54 million either served by the informal institutions or totally unbanked (CBN, 2013). The formally banked (25.4 million) use the products and services of the deposit money banks either as salaried workers or as business men and women, while the remainder (5.3 million) of the formally serviced, use the services of other formal institutions like the financial houses, microfinance banks, etc. Nigeria has a higher proportion of financially excluded adults than any other African country. In Nigeria, for example, the proportion of financially excluded adults stood at 46.3%, compared with 26.0% in South Africa, 33.0% in Botswana and 32.7% in Kenya (EFInA, 2010). This signifies that there is need for further research into what could promote financial inclusion and its multiplier effects on growth outcomes and poverty reduction in Nigeria; hence, the relevance of the current research.

As described by FSS 2020, the branches of financial inclusion in Nigeria are: banks, other financial institutions, insurance and pensions. Presently, twenty one deposit money banks are serving about 20 million clients, based on a network of about 6,000 branches and 10,000 ATMs. A considerable part of the banking market in Nigeria remains untapped and has the potential to provide a large funding base via savings mobilization. They present a large market for credit, payment, insurance and pension services, commercial banks and, hence, profit for the banks. As at July 2011, Nigeria had 866 microfinance banks (MFBs). The MFBs network served 3.8% (or 3.2 million clients) of the adult population. Of the 3.2 million clients, 65% used savings products, 14% used credit products and 4% used ATM cards. The vast majority of MFBs can boost their scale and operating capacity by exploiting the opportunities provided by the Financial Inclusion Strategy.

Financial NGOs, financial cooperatives, self-help groups, trade associations and credit unions, which comprise non-bank microfinance institutions (MFIs) are not regulated by the Central Bank of Nigeria. Over 600 MFIs are being monitored by CBN. MFIs may gain from the Financial Inclusion Strategy through increased technical assistance and funding to enhance their outreach to members in a more effective and efficient manner. The increasingly consolidated industry with 49 insurance companies can be attributed to the recapitalisation exercise of 2007. Nonetheless, as of December 2010, the insurance sector as a

whole served only 1% of the population. With 99% of the population not served, a massive business potential remains to be tapped by the insurance companies

The Compulsory Pensions Scheme (CPS) was established through the 2004 Pension Reform Act, which has been largely espoused by the Federal Government and private sector. Annual pension contributions grew from N60 billion in 2006 to N290 billion in 2010. Nevertheless, only 17 of the 36 state governments and the Federal Capital Territory have passed bills to adopt and implemented CPS. The current pension system makes allowances for voluntary contributions into which both the formal and informal sectors in Nigeria can tap. Pension fund administrators and custodians can increase their outreach to these untapped segments through appropriate products.

Literature Review

With regard to firms, Dabla-Norris et al. (2015) showed that higher access to credit could raise non-performing loans in banks and, thus, entails a trade-off with stability. According to Migap et al. (2015), access to basic financial services in Nigeria would lead to increased economic activities and employment opportunities for rural households; for as more people get engaged in economic activities, the disposable income of the rural household would rise, leading to more savings and a robust deposit base for the bank. The multiplier effect will result in economic growth, which implies inclusive growth.

Dabla-Norris et al. (2015) used a general equilibrium model to illustrate how lowering monitoring costs, relaxing collateral requirements and, thus, increasing firms' access to credit would increase growth. Mehrotra and Yetman (2015), while studying economic stability in 130 countries, found that aggregate consumption volatility is lower in countries where financial inclusion is high, especially for measures of account ownership and saving at a formal financial institution. Mbutor and Uba (2013) presented a simple model showing the impact of financial inclusion on monetary policy in Nigeria between 1980 and 2012. They found that growing financial inclusion improves the effectiveness of monetary policy. For households, Han and Melecky (2013) discovered that greater financial inclusion through broader access and use of deposits can significantly mitigate deposit withdrawals during times of financial stress.

Using a model of entrepreneurship, Serrao et al. (2012) found that microfinance has positive impacts on consumption and output. Hariharan and Marktanner (2012) proposed that financial inclusion has the potential to enhance economic growth and development. They found a strong positive correlation between a country's financial inclusion and total factor productivity (TFP),

implying that financial inclusion has the ability to create capital. The study concluded that financial inclusion has the potential to increase financial sector savings portfolio, enhance efficiency of intermediation, and boost entrepreneurial activities; these ultimately result in economic growth.

The conclusion of Aduda and Kalunda (2012) was that household access to finance has a strong positive relationship with growth, and that the relationship between depth and growth is bell-shaped, suggesting that the returns to growth fall with higher depth beyond a certain point. However, financial institution access (FIA), an index of the density of ATMs and bank branches, which also narrowly defines inclusion, has a monotonic relationship with growth. Some recent studies showed that higher financial inclusion has effect on stability and could entail trade-offs.

Sarma and Pais (2010) concluded that a financially inclusive system helps reduce the prevalence of informal financial institutions that are, in most cases, exploitative, and encourages easy access to capital and use of the formal financial system by all segments of the economy. Financial inclusion enhances efficient allocation of productive resources and, in the process, reduces the cost of capital. They concluded that financially inclusive systems enhance efficiency and welfare by providing avenues for secure and safe financial practices. Subbarao (2009) asserted that a very few economies transit from agrarian system to post-industrial modern society without a broad-based financial inclusion strategy. Financial inclusion will make it possible for governments to make payments, such as credit guarantee funds, subsidies and wages, directly to the bank accounts of beneficiaries through electronic transfer channels. This will minimize transaction cost, pilferage and leakages and thus eliminate corruption from the society.

With regard to financial inclusion, poverty and income inequality, a number of empirical studies have examined the impact of financial inclusion on poverty and income inequality. Onaolapo (2015) examined the effects of financial inclusion on the economic growth of Nigeria (1982-2012) using the Ordinary Least Square (OLS) method for analysis. The study concluded that inclusive bank financial activities greatly influence poverty reduction, but marginally determine national economic growth and financial intermediation. Moreover, while Allen et al. (2013) concluded that when the resources of the underprivileged households are tapped by commercial banks, financial access of the poor in Kenya is enhanced, Brune et al. (2011) submitted that increased financial access through expansion in savings account in rural Malawi improves the overall wellbeing of poor households, as it makes provision for accessibility to their savings for agro-based input use.

Honohan (2008) constructed a financial access indicator for 160 countries. He combined both household survey datasets and published secondary data sources on financial institutions and assessed country characteristics that might influence financial access. Among the variables explored were: aid as percent of gross domestic product, age dependency ratio, population density, mobile phone subscription, and quality of institutions. He concluded that aid as percent of gross domestic product, age dependency ratio, and population density significantly lower financial access; while mobile phone subscription and quality of institutions significantly increase financial access. Based on the cross-country relationship between poverty and financial access, the results showed that financial access significantly reduces poverty; but this is valid when financial access is used as the only determinant, i.e., it loses significance when other variables are added as determinants.

Honohan (2007) examined the relevance of financial access indicators in bridging income inequality and found that higher financial access significantly reduces income inequality (proxied by the Gini coefficient). However, the connection between financial access and income inequality depends on the specification used, i.e., when the access variable is included on its own, the results are significant, but the same does not hold when per capita income and dummy variables are included. Burgess and Pande (2005) discovered that state-led expansion of rural bank branches in India has led to reduction in poverty. The study also found robust evidence that increase in the number of bank branches in rural unbanked locations in India was associated with reduction in rural poverty rates in those areas.

Furthermore, empirical evidence have shown a relationship between weak governance system and slow financial economic development, and conversely for countries with strong governance system. Kaufmann, Kraay, and Zoido-Lobatón (2000) established that a positive relationship exists between governance (rule of law) and financial development for 166 countries for the period 1997–1998. Also for the same period, the same relationship between governance indicator (voice and accountability) and economic development for 173 countries was observed.

The link between democracy and financial development was established by some others (Huang, 2010; Roe and Siegel, 2011; Yang, 2011). There has been emerging theoretical and empirical literature directed at establishing linkage between financial development and political development. This seems to suggest that the dividends of good governance and transparent political process do have far-reaching implications for many national variables, prominent among which are financial development and deepening of a given developing economy. It is

established that a deep financial system will emerge from a political system that adheres to tenets of democracy, thus, respects of rule of law, contract enforcement, and protection of property rights, among others (Acemoglu, Johnson and Robinson, 2012). This therefore implies that financial inclusivity is more realizable under a good political dispensation that upholds the ideals of good governance. The competitive nature of democratic process can have a trickling down effect on other key subsector of national level, of which financial sector is no exception (Haber et al., 2008).

Acemoglu, Johnson and Robinson (2005) opined that the kind of economic institutions prevailing in a particular country do affect the distribution of resources, including finance. Examining the various 'models' for tackling financial exclusion in Europe, Carbo et al. (2007) highlighted the institutional structure, political styles and financial ecosystem existing in those countries playing a critical role in ensuring inclusiveness. Economic institutions, such as the structure of property rights and the presence and perfect functioning of markets mechanism (Acemoglu et al., 2005) that seek to guarantee economic freedom are pivotal to the shaping of economic outcomes like financial inclusion.

Estimation Techniques and the Models

Estimation strategy: Single equation linear GMM

The single equation linear generalised method of moment (GMM) was used in analysing the models specified. GMM estimation was formalized by Hansen (1982) and has become one of the most widely used methods of estimation for models in economics and finance. Unlike maximum likelihood estimation (MLE), this study explored the single equation linear GMM because it does not require complete knowledge of the distribution of data. (Since the missing observations in some of the variables were generated based on normal imputation techniques and the missing values were assumed to be linear functions of other observed values.) Only specified moments derived from an underlying model are needed for GMM estimation. In models for which there are more moment conditions than model parameters, GMM estimation provides a straightforward way to test the specification of the proposed model. This is a unique feature to GMM estimation.

This study utilises the superior and more policy-applicable GMM method developed by Clarida et al. (2000) in estimating the equation, because the GMM in differences approach proposed by Hansen (1982) is plagued with the problem of weak instruments. The Clarida-Gali-Gertler system estimator combines a

levels equation, using lagged first differences as instruments; this permits exploiting several additional moment conditions that dramatically improve both consistency and efficiency for values of the coefficient of the lagged dependent variable. The linear regression model was:

$$y_t = Z_t'\delta_0 + \varepsilon_t, \qquad t = 1, ------, n \qquad (1)$$

Where Z_t is a $L*1$ vector of explanatory variables, δ_0 is a vector of unknown coefficients and ε_t is a random error term. The model (1) allows for the possibility that some or all of the elements of Z_t may be correlated with the error term ε_t, i.e. $E[Z_{tk}\varepsilon_t] \neq 0 \, for \, some \, k$ if $E[Z_{tk}\varepsilon_i] \neq 0, then \, Z_{tk}$ is called an endogenous variable. It is well known that if Z_t contains endogenous variables; hence, the least squares estimator of δ_0 in (i) is biased and inconsistent.

Associated with model 1 is the assumption that there exists a $K*1$ vector of instrumental variables X_t which may contain some or all of the elements of Z_t. Let w_t represent the vector of unique and nonconstant elements of $\{y_t, z_t, x_t\}$. It is assumed that $\{w_t\}$ is a stationary and ergodic stochastic process. The instrumental variable x_t satisfies the set of K orthogonality conditions:

$$E[g_t(w_t, \delta_0)] = E[x_t\varepsilon_t] = E[x_t(y_t - Z_t'\delta_0)] = 0 \qquad (2)$$

Where $g_t(w_t, \delta_0) = x_t\varepsilon_t = x_t(y_t - Z_t'\delta_0)$

Expanding (2) gives the relation:

$$\sum xy = \sum xz\delta_0$$

Where:

$$\sum xy = E[x_t y_t] \, and \sum xz = E[x_t Z_t']$$

For identification of δ_0, it is required that the $K * L$ matrix $\sum xz = E[x_t Z_t']$ be of full rank *L*. This rank condition ensures that δ_0 is the unique solution to equation 2. A necessary condition for the identification of δ_0 is the order condition:

$$K \geq L \qquad (3)$$

Equation 3 simply states that the number of instrumental variables must be greater than or equal to the number of explanatory variables in equation 1. If $K = L$, then δ_0 is said to be (apparently) just identified, if $K \succ L$, then δ_0 is said to be (apparently) over-identified, if $K \prec L$, then δ_0 is not identified. The word "apparently" in parenthesis is used to remind the reader that the rank condition must be equal to L, that is:

$$rank\left(\sum xz\right) = L \quad (4)$$

Equation 4 must also be satisfied for identification.

Moreover, to analyse the effect of financial inclusion and governance on welfare in Nigeria, the study specified three models to capture this. The variables are represented in log-log form, so the analyses of the estimates are interpreted in the form of elasticities. The models are specified as follows:

Model A: Sensitivity of infrastructural investment to financial inclusion and governance:

$$\ln INF_t = \eta_0 + \eta_1 \ln CBD_t + \eta_2 \ln NBB_t + \eta_3 \ln LRA_t + \eta_4 \ln COC_t + \eta_5 \ln PSAV_t + \eta_6 \ln BF_t + \eta_7 \ln INF_{t-1} + \tau_t \quad 5$$

Model B: Sensitivity of per capita GDP to financial inclusion and governance:

$$\ln GDPP_t = \alpha_0 + \alpha_1 \ln CBD_t + \alpha_2 \ln NBB_t + \alpha_3 \ln LRA_t + \alpha_4 \ln COC_t + \alpha_5 \ln PSAV_t + \alpha_6 \ln BF_t + \alpha_7 \ln GDPP_{t-1} + \varepsilon_t \quad 6$$

Model C: Sensitivity of income inequality to financial inclusion and governance:

$$\ln GINI_t = \beta_0 + \beta_1 \ln CBD_t + \beta_2 \ln NBB_t + \beta_3 \ln LRA_t + \beta_4 \ln COC_t + \beta_5 \ln PSAV_t + \beta_6 \ln BF_t + \beta_7 \ln GINI_{t-1} + \gamma_t \quad 7$$

The estimation weighting matrix is used to compute standard errors and covariance matrix. Bartlett kernel, Newey-West fixed bandwidth is equal to 4.0000. The instrument specification for the models is of the order:

$$INF(-1)\,GDPP(-1)\,GINI(-1)\,CBD(-1)\,NBB(-1)\,LRA(-1)\,COC(-1)\,PSAV(-1)\,BF(-1)$$

The inclusion of past values of all the dependent and explanatory variables in the instrument set was due to their endogeneity (Clarida et al., 2000). The inclusion of one lag period hinged on the fact that the variables of interest did not turn out to have any significant effects beyond one lag.

Data description and sources

Table 1: Variables, descriptions and sources

S/N	*Variable*	*Description of Variable*	*Source*
1	CBD	Commercial bank deposit (CBD) used as a proxy for financial inclusion. Depositors with commercial banks are the required number of deposit account holders at commercial banks and other resident banks functioning as commercial banks that are resident non-financial corporations (public and private) and households. The major types of deposits are checking accounts, savings accounts, and time deposits.	WDI, 2015
2	GDPP	GDP per capita (GDPP). Calculated as the ratio of GDP (constant 2000 US$), Y, and population. It is used as a proxy for the standards of living.	WDI, 2015
3	NBB	Number of commercial bank branches per 1000km^2(NBB) is used as financial access indicator. It is also calculated as number of commercial bank branches per 100,000 adults, this indicate how accessible the banks are to the bank user.	CBN Statistical Bulletin, 2015
4	GINI	Gini Index (GINI) used to proxy income inequality. Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. Thus, a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.	World Income Inequality data base, 2015
5	COC	Control of Corruption (COC). This a dimension of governances in Worldwide Governance Indicators (WGI) project by World Bank Group, which reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	Worldwide Governance Indicators (WGI), by World Bank Group, 2015
6	BF	Business Freedom (BF) is an overall indicator of the efficiency of government regulation of business. The quantitative score is derived from an array of measurements of the difficulty of starting, operating, and closing a business. The business freedom score for each country is a number between 0 and 100, with 100 equalling the freest business environment.	Heritage Foundation Index of Economic Freedom, 2015
7	PSAV	Political Stability and Absence of Violence/ Terrorism (PSAV) measures perceptions of the likelihood of political instability and/or politically-	World Bank Governance Indicators, 2015

		motivated violence, including terrorism.	
8	INF	Infrastructural Investment (INF)-This is proxied by Total Public Expenditure on Education, Power and Transport as% of GDP.	Expenditure on education is obtained from the UNESCO Institute for Statistics online database, 2015; Expenditure on power is obtained from EIA, 2015; and Expenditure on Road is obtained from Natural Earth ADB, 2015
9	LRA	Loan to Rural Areas (LRA). It is measured through the commercial and microfinance banks credits to rural areas	CBN Statistical Bulletin, 2015

Source: Authors computations/compilations from various sources.

* *Note*: The missing observations in BF, COC and PSAV were generated based on normal imputation techniques, since the missing values are assumed to be linear functions of other observed values. For details see, (i) Honaker and King (2011) *"Applications of modern methods for analyzing data with missing values, based primarily on multiple imputations and Weighting Approaches";* (ii) Maravall and Pena (2014). *"Missing Observations and Additive Outliers in Time Series Models: Interpolation using ARIMA Processes"*

Empirical Findings

Unit root test: KPSS

To determine the order of integration of the variables used in the model, the time series properties of the data were examined. A series is said to be integrated of order *d*, denoted *I(d)*, if the series becomes stationary or I(0) after being differenced *d* times. The Kwiatkowski-Phillips-Schmidt-Shin (KPSS) is performed. The test statistics allow one to test formally the null hypothesis that a series is stationary at first difference - I(1) or stationary at levels, that it is I(0). The result was consistent and showed that all the variables were integrated of order one (table 2). The implication of the unit root test result was that the null hypothesis was rejected, thus it was concluded with a very low probability of making an error that the time series had no unit root.

Cointegration test

Nonstationary time series variables may have some linear combination that is stationary; such variables are said to be cointegrated. This implies that there is a

long-run relationship among the variables. If the tests for stationarity reveal that most of the variables are not stationary, there is the need to conduct cointegration test. This study explored the Engle-Granger cointegration approach. The null hypothesis stated that series were not cointegrated. Examining the probability values of both tau-statistics and z-statistics of the cointegration test in table 3, the study concluded that there was cointegrating relationship among the variables. This means that there existed a long-run equilibrium condition among the variables.

Table 2: KPSS test statistics

Variable	*LM-Statistics*	*1%*	*5%*	*Conclusion*
lnINF	3.635217*	0.739000	0.463000	I(1)
lnGDPP	0.725786**	0.739000	0.463000	I(1)
lnGINI	0.621151**	0.739000	0.463000	I(1)
lnCBD	0.433406**	0.739000	0.463000	I(1)
lnNBB	0.629974**	0.739000	0.463000	I(1)
lnLRA	0.661162**	0.739000	0.463000	I(1)
lnCOC	1.124359**	0.739000	0.463000	I(1)
lnPSAV	0.567255**	0.739000	0.463000	I(1)
lnBF	0.463440**	0.739000	0.463000	I(1)

Notes: All the variables are stationary at first difference. The asymptotic critical values of KPSS unit root tests are in their respective levels of significance. * (**) denotes the rejection of the null hypothesis at 1% (5%) significance level.
Source: Author's computation

Table 3: Engle-Granger Cointegration Test

Variables	*tau-statistic*	*Prob.**	*z-statistic*	*Prob.**
lnBF	-4.774768	0.0375	-26.98980	0.4138
lnCBD	-2.323021	0.9959	-18.89607	0.8436
lnCOC	-6.893882	0.0167	-37.72340	0.0359
lnGDPP	-6.277417	0.0504	-104.5354	0.0000
lnGINI	-5.600764	0.0136	-33.10118	0.1314
lnINF	-7.063442	0.0140	133.4589	1.0000
lnLRA	-3.387548	0.8945	-15.57485	0.9493
lnNBB	-3.804734	0.7719	-33.82821	0.0995
lnPSAV	-3.882310	0.7425	-20.68086	0.7772

Note: Automatic lags specification based on Schwarz criterion (maxlag=8)
Source: Author's computation

GMM estimation result

The results in tables 4, 5 and 6 capture the transmission mechanism of financial inclusion and governance to infrastructural investment, per capita GDP and

income inequality, respectively. The estimation-weighing matrix was used to compute standard errors and covariance matrix. Bartlett Kernel, Newey-West fixed bandwidth was equal to 4.

Table 4: Sensitivity of infrastructural investment to financial inclusion and governance

Instrument specification: lnBF(-1) lnCBD(-1) lnCOC(-1) lnLRA(-1) lnNBB(-1) lnPSAV(-1) lnINF(-1) PSAV(-1) C

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
lnBF	15.69228	62.83571	0.249735	0.8047
lnCBD	1.759769	1.096964	1.604218	0.1203
lnCOC	33.0961	645.9767	0.531128	0.0197
lnLRA	13.06494	19.13375	0.682822	0.0500
lnNBB	0.008845	0.036447	0.242683	0.8101
lnPSAV	22.81502	85.65427	0.266362	0.0290
lnINF(-1)	0.286485	13.83237	0.410985	0.2017
C	-1547.969	2801.706	-0.552510	0.5851

R-squared	0.742076	Mean dependent var	121.4615
Adjusted R-squared	0.684759	S.D. dependent var	178.4596
S.E. of regression	100.1985	Sum squared resid	271072.9
Durbin-Watson stat	2.288385	J-statistic	2.053339
Instrument rank	8	Prob(J-statistic)	0.151873

Note: Dependent Variable is INF

Source: Author's computation

Table 4 shows the impact of financial inclusion and governance on infrastructural investment. It is evident from the result that both the financial inclusion and governance variables were positively related to investment in infrastructure. A percent increase in business freedom, commercial bank deposit, control of corruption, loan to rural area, number of bank branches, political stability and absence of violence and one-period lag of infrastructure investment would, other things being equal, lead to 15.69, 1.75, 33.10, 13.06, 0.009, 22.81 and 0.29 percent increases in infrastructure investment, respectively. The implication of this result is that an increase in each of these regressors enhances infrastructural investment in Nigeria. Moreover, with the values of the probabilities, commercial bank deposit, control of corruption, loan to rural areas and political stability and absence of violence were the variables that were statistically significant in determining infrastructural investment in Nigeria. However, business freedom, number of bank branches and the first lag of infrastructural investment were not determinants of infrastructural investment.

Table 5: Sensitivity of per capita GDP to financial inclusion and governance

Instrument specification: lnBF(-1) lnCBD(-1) lnCOC(-1) lnLRA(-1) lnNBB(-1) lnPSAV(-1) lnGDPP(-1) PSAV(-1) C

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
lnBF	-2.308.55	22762.28	-0.980067	0.0335
lnCBD	9.75823	367.5205	2.578311	0.0157
lnCOC	1.60125	195388.3	-0.819525	0.0419
lnLRA	1.80747	7562.070	2.390135	0.0241
lnNBB	7.67558	18.84991	0.407172	0.6871
lnPSAV	3.34828	49378.01	0.678091	0.0503
lnGDPP(-1)	-5.80285	19.71201	0.219021	0.0192
C	-11.1458	1015028.	-0.010981	0.9913
R-squared	0.912782	Mean dependent var		96580.76
Adjusted R-squared	0.893400	S.D. dependent var		149135.2
S.E. of regression	48692.12	Sum squared resid		6.40E+10
Durbin-Watson stat	2.120636	J-statistic		0.047430
Instrument rank	8	Prob(J-statistic)		0.827597

Note: Dependent variable is GDPP

Source: Author's computation

The impact of financial inclusion and governance on per capita GDP is represented in table 5. It is evident that commercial bank deposit, control of corruption, loan to rural areas, number of bank branches, and political stability and absence of violence were positively related to per capita GDP. This means that a percent increase in the aforementioned variables will enhance GDP per capita by 9.76, 1.60, 1.81, 7.68 and 3.35 percent, respectively. The remaining variables (business freedom and the lag of infrastructural investment) were negatively related to GDP per capita. This implies that a percent increase in business freedom and the lag of infrastructural investment will lead to a decline of 2.31 and 5.80 percent, respectively. Looking at the probability values of the estimates, business freedom, commercial bank deposit, control of corruption, political stability and absence of violence, and the lag of per capita GDP were statistically significant in the determination of GDP per capita. Conversely, loan to rural areas and number of bank branches were not significantly related to per capita GDP.

The relationship among financial inclusion variables, governance perception indices and infrastructural investment in Nigeria is shown in table 6. An in-depth examination of the result shows that control of corruption, loan to rural areas, political stability and absence of violence and the lag of Gini coefficient were negatively related to income inequality. A percent increase in these variables will, respectively, result in 8.00, 0.09, 6.62 and 2.10 percent decrease in income

inequality. By intuition, when these variables are triggered in Nigeria, they tend to bridge the gap between the rich and the poor and reduce the prevalence of poverty in the economy.

Table 6: Sensitivity of income inequality to financial inclusion and governance

Instrument specification: lnBF(-1) lnCBD(-1) lnCOC(-1) lnLRA(-1) lnNBB(-1) lnPSAV(-1) lnGINI(-1) PSAV(-1) C

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
lnBF	0.153974	1.625399	-0.094730	0.9252
lnCBD	0.009618	0.020777	-0.462903	0.0341
lnCOC	-7.995305	14.20019	-0.563042	0.0511
lnLRA	-0.087623	0.449638	0.194875	0.0469
lnNBB	1.000222	0.000517	-0.429055	0.0213
lnPSAV	-6.619908	1.945038	-3.403485	0.0021
lnGINI(-1)	-2.097456	0.218974	1.803275	0.0291
C	133.4334	71.95134	1.854495	0.0746
R-squared	0.756247	Mean dependent var		40.19412
Adjusted R-squared	0.740969	S.D. dependent var		3.441013
S.E. of regression	3.280770	Sum squared resid		290.6131
Durbin-Watson stat	1.991722	J-statistic		0.122206
Instrument rank	8	Prob(J-statistic)		0.726654

Note: Dependent Variable is GINI
Source: Author's computation

However, business freedom, commercial bank deposit and number of bank branches are positively related to income inequality in Nigeria. A percent increase in the variables will, respectively, increase income inequality by 0.15, 0.01 and 1.00 percent. This implies that these variables have the tendency to worsen income inequality and promote poverty if not properly managed. For instance, since the banking variables (commercial bank deposit and number of bank branches) are in this category, if the variables are not properly conceived, they can lead to financial exclusion of the poor, because of the stringent financial conditions attached to financial service accessibility in Nigeria. A deeper look at the probability values shows that almost all the variables are statistically significant in determining income inequality in Nigeria, except business freedom. The reason may be due to the fact that Nigeria has no strict policy to restrain the fundamental rights of people to control their businesses, labour and property.

Conclusion and Policy Implications

The study examined the time series properties of the data so as to determine the order of integration of the variables used in the model through the KPSS

technique. It was revealed that all the variables were integrated of order one. Subsequently, the long-run relationship among the variables was examined with the use of Engle-Granger cointegration approach, and this disclosed the cointegration relationship existing among them, resulting in the rejection of the null hypothesis of no cointegration. The transmission mechanism of financial inclusion and governance to infrastructural investment, per capita GDP and income inequality coefficient were also analysed with the aid of single equation linear GMM estimation technique.

It was found that number of bank branches, loan to rural areas, control of corruption, and political stability and absence of violence were positively related to investment in infrastructure. The implication of the positive relationship is that these variables are the major routes through which investment in infrastructure boost economic progress in Nigeria. In addition, it was discovered that commercial bank deposit, control of corruption, loan to rural areas, number of bank branches, and political stability and absence of violence were positively related to per capita GDP. This implies that an increase in these variables will result in an equivalent increase in per capita GDP of Nigeria, which is an indicator of the standard of living of the populace. Contrarily, control of corruption, loan to rural areas, political stability and absence of violence and the lag of Gini coefficient were negatively related to income inequality. Hence, improvement in these variables will reduce income inequality, alleviate poverty and increase the welfare of the poor in the country.

The result of the transmission mechanism hinged on the fact that financial inclusion and governance variables pass through the macroeconomy from three channels: investment in infrastructure, per capita GDP, and income equality. Based on the analysis, it is concluded that the welfare of the poor can be enhanced through these channels. The policy implication of the results and its impact on the welfare of the poor is centred on the following:

1. Adequate financial and political security need to be put in place, in view of the fact that the financial institution variables and governance perception indices are vital in the transmission mechanism of financial inclusion and governance to investment in infrastructure and per capita GDP of Nigeria. This will enhance financially and politically secure system of governance that will heighten the confidence of the populace to transact business and increase the employment rate in the country, hence, an improvement in the standard of living of the poor. This result is in consonance with the findings of Honohan (2008), that good governance, high institutional quality and

increased financial inclusion will significantly improve the welfare of the poor in developing countries.

2. Efforts towards reducing the high level of inequality between the rich and the poor should be made through transparent and inclusive governance in a bid to achieve the required stability in the economy's financial system, as well as its role in fighting poverty in a sustainable manner, as income inequality index is one of the major routes through which governance and financial inclusion impact on the welfare of the poor in Nigeria. Sustainable economic growth and development with permeative income redistribution will assist majority of the financially excluded populace to subdue poverty, earn more income and, hence, save more. If all these are in place, the country will be adjudged to be making progress economically. This result is in line with the conclusion of Onaolapo (2015) that inclusive bank financial activities greatly influence poverty reduction in Nigeria.
3. The government should put in place programmes that address growing income inequality and alleviate poverty, as a measure of addressing financial exclusion of low-income groups from financial services that has the potential of reducing income inequality and increasing per capita GDP. Transparent democratic practices that increase investment in infrastructure and enhance per capita GDP in order to alleviate poverty should also be entrenched in the political system. The role of microfinance should not be underestimated. Availability of credit to lower income groups (the rural dwellers) improves their access to financial services, which in turn enables them to undertake productive activities and experience increased welfare.

References

Acemoglu, D., Johnson, S. and Robinson, J.A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of Economic Growth*, 1, 385-472.

Acemoglu, D., Johnson, S. and Robinson, J.A. (2012). The colonial origins of comparative development: An empirical investigation. *The American Economic Review*, 102(6): 3077-3110.

Aduda, J. and Kalunda, E. (2012). Financial inclusion and financial sector stability with reference to Kenya: A review of literature. *Journal of Applied Finance and Banking*, 2(6): 95-120.

African Development Bank (AfDB) (2013). Financial inclusion in Africa. Accessed from www.afdb.org.

Allen, F.E., Carletti R., Cull J. Senbet Q.L. and Valenzuela P. (2013). Resolving the African financial development gap: Cross-country comparisons and a within-country study of Kenya. World Bank Policy Paper No.6592. Washington DC.

Brune, L., Giné X., Goldberg J. and Yang D. (2011). Commitments to save: A field experiment in rural Malawi. World Bank Policy Research Paper No.5748. Washington DC.

Burgess, R. and Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. *American Economic Review,* 95(3): 780–795.

Carbo, S., Gardener E.P. and Molyneux P. (2007). Financial exclusion in Europe. *Public Money and Management*, 27(1): 21-27.

Central Bank of Nigeria – National Financial Inclusion Strategy (CBNNFIS). (2012). Summary report on financial inclusion in Nigeria. Abuja, 20th January. Available at www.cenbank.org.

Central Bank of Nigeria (2013). *CBN Statistical Bulletin.* CBN, Abuja. 24.

Central Bank of Nigeria (2014). *CBN Statistical Bulletin.* CBN, Abuja. 25.

Central Bank of Nigeria (2015) . *CBN Statistical Bulletin.* CBN, Abuja. 26.

Central Bank of Nigeria (2015). National financial inclusion strategy. Summary report. CBN, Abuja.

Clarida, R., Gal´ı, J. and Gertler, M. (2000). Monetary policy rules and macroeconomic stability: Evidence and some theory. *Quarterly Journal of Economics*, 115: 147–80.

Dabla-Norris, E., Ji Y., Townsend R. and Filiz U. (2015). Financial deepening, growth, and inequality: A structural framework for developing countries. IMF Working Paper. International Monetary Fund, Washington DC.

EFInA Report. (2010), EFInAx – Access to Financial Services in Nigeria 2010 Survey. http://www.efina.org.ng/assets/ResearchDocuments/2013-Documents/EFInA-Access-toFinancial-Services-in-Nigeria-2012-surveyKey-Findings2.pdf.

Energy Information Administration (2015). Statistical data bank. EIA.

Han, R. and Melecky, A. (2013). Financial inclusion for financial stability: Access to bank deposits and the growth of deposits in the global financial crisis. World Bank Policy Research Paper, No.6577.

Haber, S.H., North, D.C. and Weingast, B.R. (2008). *Political Institutions and Financial Development.* Stanford University Press, Stanford.

Hansen, L.P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica,* 50: 1029-1054.

Hariharan, G. and Marktanner, M. (2012). The growth potential from financial inclusion. Available at www.frbatlanta.org/documents/news/conferences.

Huang, Y. (2010). Political Institutions and financial development: An empirical study. *World Development*, 38(12): 1667-1677.

Honaker, J. and King, G. (2011). Applications of modern methods for analyzing data with missing values, based primarily on multiple imputations. *American Journal of Political Science,* 54(2): 561–581.

Honahan, P. (2007). Cross-country variation in household access to financial services. World Bank Paper conference on Access to Finance. Washington DC.

Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking and Finance*, 32: 2493–2500.

International Monetary Fund (2005). Financial access survey (FAS) data. Available at www.imf.org.

Kaufmann, D., Kraay, A. and Zoido-Lobatón, P. (2000). Governance matters. *Finance Devevelopment*, 37(2): 10.

Maravall, A. and Pena, D. (2014). Missing observations and additive outliers in time series models: Interpolation using ARIMA processes. Accessed from www.bde.es.

Mbutor, O.M. and Uba I.A. (2013). The impact of financial inclusion on monetary policy in Nigeria. *Journal of Economics and International Finance*, 5(8): 318-326.

Mehrotra, A. and Yetman, J. (2015). Financial inclusion and optimal monetary policy. Paper at the joint conference of the European Central Bank and the Central Bank of the Republic of Turkey, Frankfurt, 27-28 August.

Migap, J.P, Okwanya, I. and Ojeka, G. (2015). Financial inclusion for inclusive growth: The Nigerian perspective. *International Journal of Information Technology and Business Management,* 37(1): 1-8.

African Development Bank (AfDB) (2015). Data bank. Natural Earth.

Njideka, U.H. (2014). How to promote financial inclusion in Nigeria. Available at www.weforum.org/agenda/2014.

Onaolapo, A.R. (2015). Effects of financial inclusion on the economic growth of Nigeria (1982-2012). *International Journal of Business and Management Review* 3(8):11-28.

Roe, M.J. and Siegel, J.I. (2011). Political instability: Effects on financial development, roots in the severity of economic inequality. *Journal of Comparative Economics*, 39(3): 279-309.

Sarma, M. (2008). Index of financial inclusion. Working Paper No. 215. Indian Council for Research on International Economic Relations. 1-26.

Sarma, M. and Pais J. (2010). Financial inclusion and development. *Journal International Development,* 23: 613-628.

Serrao, M., Sequeira A.H. and Hans B.V. (2012). Designing a methodology to investigate accessibility and impact of financial inclusion.

Subbarao, D. (2009). Financial inclusion: Challenges and opportunities. Presented at the Reserve Bank of India's Bankers Club, Kolkata, December 9.

World Bank (2015). How to measure financial inclusion. Accessed from wwwindicators.

World Bank Governance Indicator (2015). Data bank. Available at worldbank.org.

World Income Inequality Data (2015). Income data. Available at www.wider.unu.edu.

Yang, B. (2011). Does democracy foster financial development? An empirical analysis. *Economics Letters*, 112(3): 262-265.