
Analysis of Financial Inclusion and Economic growth: Evidence from Panel Sample of Developing Countries, Panel VAR Approach

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Abstract

The study investigated the relationship between financial and economic growth of Developing Countries which comprised twenty-three developing countries using panel data from 2010 to 2023. The Panel unit root tests indicated that real gross domestic product, bank branches, Automated Teller Machines, bank account, are stationery at first difference. in developing countries. The panel VAR result shows that Automated Teller Machine, Bank branches, Bank account, and Money supply have positive shocks effects on real gross domestic product in developing countries. product in the developing countries. The study recommends that the policy should task financial institution to provide more and improved financial services in both rural and urban to ensure everyone could participate and contribute more to national productivity and achieve higher economic growth in developing economies.

Key words: Financial inclusion, Economic growth & Panel Data

JEL Classification G21, O40,

1. Introduction

Financial inclusion has assumed a greater level of importance among policy makers and researchers across the globe. This is as a result of its efficient role as a driver of economy, and also, the promise it holds as a tool for economic development, particularly in the area of wealth creation, employment generation, poverty reduction, improving welfare and general standard of living (Charles-Anyagwu, 2020). Financial inclusion ranked the seventh in the sustainable development goals. Financial inclusion got importance throughout the world due to its substantial impacts on growth, entrepreneurship, employment, income inequality and poverty alleviation (Dixit and Ghosh, 2013; Onaolapo, 2015; Fadun, 2014). Financial inclusion has positive impacts on individuals level of income and thereby, economy as whole. Enhancing financial inclusion modernizes the agriculture, promotes innovation, surges entrepreneurship and increases growth (Kelkar, 2010). For low-income group, access to credit creates entrepreneurship as well as investment opportunities, output increases and hence growth increases (Islam and Mamun, 2011).

Over 70% of the world's population has no access to banking services for their fundamental financial needs (Sehrawat, & Giri; Yadav, & Sharma, 2016), and roughly 75% of adults earn less than 2 USD per day, which is the international poverty line, and do not have a bank account (World bank, 2020). Furthermore, in developing countries, 50% of the population does not have a bank account. Financial inclusion is an attempt to convert the unbanked population into a banked population by enhancing access to FF services including savings, payments, credit, and insurance.

FI and growth go hand in hand (King, & Levine, 1993) through job creation, reducing vulnerability, and increasing investment. This further enhances the accessibility and affordability of financial goods and services to work toward the sustainable goals of economies (World Bank, 2018). Therefore, financial inclusion (i.e. access to formal financial services) has the potential to help transform the lives of low-income households and businesses of firms. The access and usage of saving, transaction, and credit services can play a central role in household efforts to smooth consumption, firms to invest in human or productive capital, and reduce exposure to uncertainties. These services are, specifically important for the poor in developing countries. Besides, it also helps those who face fluctuating incomes in the informal sectors, and who are vulnerable to significant health and institutional shocks (Demirguc-Kunt, et al. 2019). About 2.5 billion people are excluded from financial services globally, specifically those impoverished who live in middle-income countries and the poorest parts of the world. It is also estimated that approximately 80 per cent (300 million people) of the population from 11 Sub-Saharan African Countries, do not have a formal bank account, and as a result, they are deemed 'financially excluded'. These conditions indicate the importance of financial inclusion in developing countries. Moreover, the fundamental barrier to slow development in developing countries especially African, is attributed to lack of money (Zins & Weill, 2016).

In an underdeveloped financial system, where availability of funds is less and that too at higher costs, fewer would be the economic activities that can be financed and hence, lower the resulting economic growth. The developed financial systems also encounter difficulties in serving low-income groups for financing their consumption and other needs. The poor people are generally excluded by formal financial institutions due to lack of required securities needed for the purpose (World Bank, 2002). Therefore, as mentioned earlier, they have to resort to high-cost informal sources such as moneylenders, thereby leading to the benefits of growth getting concentrate in the hands of those already served by the formal financial system (RBI, 2008). In India, around 66 per cent of large farmers are reported to have a deposit account and 44 per cent have access to credit, while around 87 per cent of marginal farmers/landless labourers do not have access to credit from the formal system (World Bank NCAER, 2004). So, without an inclusive financial system, poor individuals and small enterprises have to trust on their own limited savings and earnings to invest in education and entrepreneurship to take advantage of growth opportunities (World Bank, 2008). Therefore, access to safe, easy and affordable credit and other financial services by the poor and vulnerable groups, especially in disadvantaged areas and lagging sectors, is recognized as a prerequisite for accelerating economic growth and reducing income disparities and poverty (Kakwani, 2000; RBI, 2008).

2. Concept of Financial Inclusion

The term financial inclusion has taken on a multitude of meanings. A review of literature reveals that there is no universally accepted definition of financial inclusion. The definitional emphasis of financial inclusion varies across countries, depending on the level of social, economic and financial development of that place and priorities of social concerns. Onaolapo (2015) defined Financial Inclusion as a process that ensures the ease of access, availability and usage of the formal financial system by all members of an economy. Also, Financial Inclusion is defined as the timely delivery of financial services to the disadvantaged and low-income segment of the society at an affordable price (Mohan, 2016).

2.2 Empirical literatures

Monogbe, Igoni and Igoni (2021) investigated the connectivity between Financial Inclusion strategies in the phase of Covid-19 scourge and the economic stimulation effect in Nigeria using time series data and employed financial accessibility, Capital market, Inclusion, Insurance Sector, Inclusion, Informal financial product, Money Outside the Banking system, and Informal Sector Mobilized Deposit for financial inclusion strategies and gross domestic product per capita as variables in the model. The study adopted Auto regressive distributed lag (ARDL) model and the study found a negative and significant relationship between Money outside the Banking system, and Insurance Sector and economic stimulation. The study however found a positive and insignificant relationship between DM, FA, FP, CM and economic stimulation in Nigeria within the covid-19 era. The study recommended for a full and deepen financial inclusion society to capture the vulnerable and rural excluded populace of Nigerian environment. Finally, conventional banks should spread more Auto Teller Machine retail outlet and financial education especially in rural areas.

Joseph (2020) investigated the effect of financial inclusion on inclusive growth in Nigeria covering the periods of 1981 to 2017. The study employed the following variables: rural loan, number of bank branches, money supply-GDP ratio, private sector credit to GDP ratio and GDP per capita and adopted Auto-Regressive Distributed Lag (ARDL) model. The study found that financial inclusion, in the form of rural loan, number of bank branches and level of liquidity have a positive and significant effect on inclusive growth in the short and long run, while interest rate impede inclusive growth. The study recommends more and improved financial services are made available to rural dwellers and the economy in general to help them participate and contribute more to national productivity.

Machdar (2020) analyzed the effect of financial inclusion on sustainable economic growth for Indonesian banking companies and to investigate the effect of financial inclusion on sustainable economic growth through financial system stability using time series data and employed Ordinary least square (OLS) model. The study employed the following variables score index of bank, total assets of bank, Retained earnings of bank, Earnings before interest and tax of bank, and Market value of shares of bank and that the financial inclusion does not affect sustainable economic growth in Indonesian banking companies, and the financial system stability mediates the effect of financial inclusion on sustainable economic growth in Indonesian banking companies.

Usman and Adigun (2019) examined the relationship between financial inclusion and money supply in Nigeria from 1981 to 2016. Total loans of rural banks, total deposit of rural banks, the number of Automated Teller Machines (ATM) per 100,000 adults and total number of commercial bank branches are the variables included in the model. The study employed Multiple Regression and Error Correction Model and the result revealed important positive relationships between currency supply and total loan of rural banks ($t=4.651$, $p=0.001$), total credit to individuals ($t=4.427$, $p=0.0001$), number of bank branches ($t=1.734$, $p=0.094$) and the number of ATMs per 100,000 adults ($t=3.605$, $p=0.0012$). suggested that Central Bank of Nigeria (CBN) should implement financial policies that will generate a positive investment climate through market based interest rate that will inspire investments and absolutely impact money supply and hence lead to rise in the financial inclusion level.

Dandibi, Wurim, and Umaru, (2019) examined the impact of financial inclusion and financial literacy on the performance of agro-based SMEs in Yobe State, Nigeria using cross sectional data and administering 315 questionnaire. The study used financial literacy, availability, accessibility, affordability and usability and employed Ordinary least square model (OLS). The result revealed that availability, accessibility, affordability and usability of financial services all have significant effect on the performance of agro-based SMEs in Yobe State. Also, financial literacy fully mediated the relationship between the availability of financial services and the performance of agro-based SMEs in Yobe State while partially mediating the relationship between accessibility and affordability of financial services and performance.

Anthony-Orji, Orji, Ogbuabor, and Onoh, (2019) investigated the impact of monetary policy shocks on financial inclusion in Nigeria using the Vector Autoregression Model (VAR). Financial inclusion, interest rate, money supply, and deposit rates of bank deposit are the variables in the model. Findings of the study reveal that shocks to minimum rediscount rate, interest rate, broad money supply and deposit rates of deposit banks all have significant impact on financial inclusion in Nigeria. The study recommends that there is need to adopt effective monetary policy measures that will increase financial inclusion in the country.

Datta and Singh (2019) analyzed the financial inclusion scenario across several developed or developing countries of the world using times series data and the study employed per capita gross national income, population aged 15-64, school enrolment at lower secondary level, life expectancy and urban population as variables. The study used pooled OLS and Principal Component Analysis (PCA) in the analysis and the result shows that PCGNI, population, education and life expectancy together with region dummies have the expected positive sign and are significant. The major weakness of the paper is estimating pooled OLS in time series data.

Chu (2019) examine the determinants of financial inclusion in high, middle, and low-income Countries using cross sectional data variables used in the study includes Gender, age, age square, education, employment and income. The study adopted logit model and found that being a man, more educated, richer, employed, and older to a certain age increases the likelihood of access to formal financial services. For the three country sub-groups, the impacts of education and income on the likelihood of saving and borrowing formally are highest in high-income countries and lowest in low-income countries but the ranking is reverted for formal account and payment. However, the magnitude of impacts increases with the level of education and income in each of country sub-groups for all measures formal financial inclusion.

Lei, Dang, Nguyen, Vu, and Tran (2019) investigated the key determinant of financial inclusion among Asian countries via Random effects model, variables employed in the analysis includes Gdp, literacy, income, unemployment, inflation, population density, network, interest rate, geography and Islamic banking. The study found that Countries with stronger economic growth and higher income have significant higher financial inclusion index, the higher the literacy the better financial inclusions as people with higher literacy understand the pros and cons of financial services and provides better knowledge of using financial service wisely.

Ngoma (2019) examined the determinants of financial inclusion in Zimbabwe using a binary logit model and employed the followings variables which includes account ownership, saving, borrowings, mobile money account, income, workforce, education, and gender. This study established that individual characteristics: age, income, gender, education and employment status

were the determinants of financial inclusion in Zimbabwe. In addition, this study established that trust in financial institutions was the major reason why the majority remained unbanked.

Elsayed and Elatroush (2019) investigated the main deterrents that may affect financial inclusion in sample of 21 middle-income countries using cross sectional data, variables used in the study includes Financial institution account, ATMs, commercial bank branches, borrowings from financial institutions, borrowings to start or operate a business, percentage of savings within financial institutions, savings for education, savings to start, and finally operate or expand a business. The study employed Two stages least squares and principal component techniques. The mor problem with the paper is inability to show and present the major findings of the study.

Bouzkurt, Karakus and Yildiz (2018) investigated the factors generating changes in the financial inclusion levels based on data from 120 countries from 2011 to 2014 (panel data). The study adopted OLS and spatial regression analysis and used the followings variables in the analysis. The results show that social, banking and political factors play an important role in the determination of change in financial inclusion. The study also finds that financial inclusion convergence among the countries.

Akileng, Lawino and Nzibonera (2018) examined how financial literacy and financial innovation can improve financial inclusion among households in Uganda using Cross sectional data and employed the following variables such as financial inclusion, financial literacy, financial innovations, age in years, income, education and gender. The study adopted logit model and findings indicates that financial literacy and financial innovation are better determinants of financial inclusion among households.

Uddin, Chowdhury, Nazrul Islam (2017) analyzed the role of types of banks in financial Inclusion in Bangladesh using panel data and adopted generalized methods of moments (GMM) and Quantile regression approach in the analysis variables used in the study includes financial inclusions, bank size, cost to income ratio, interest rate on deposits (profit rate for Islamic Banks), interest rate (profit rate) on loan and advances, natural log of Gross national income (GNI), inflation rate, literacy rate, and dependency ratio. The study found that, on the supply side, the size of a bank, its efficiency, and the interest rate it charges has a directs impact on financial inclusion. Where on the demand side, literacy rate is positively and age, dependency ratio are negatively related to financial inclusion. In addition to that, quantile regression analysis found that bank size has a significant impact on both deposit collection and loans & advances disbursement of a bank.

Ajide (2017) examined the determinants of financial inclusion by specially accounting for the role of institutions in a panel of eighteen (18) sub-Saharan Africa (SSA) countries using a dynamic system of Generalized Method of Moments (SYS-GMM). The study employed GDP per capita, inflation, real interest rate, private credit, asset of three largest bank, (ROA), and composite good governance such as political stability, Accountability and voice, and control of corruption. Findings indicates show consistently stress the importance of institutions together with other control variables like GDP per capita, inflation, bank concentration and z-score as key drivers of financial inclusions.

Onaolapo (2015), in his study examined the effects of financial inclusion on the economic growth of Nigeria (1982-2012). According to the researcher, data for the study were collected from secondary sources like Statistical Bulletins of the Central Bank of Nigeria (C.B.N.),Federal Office

Of Statistics (F.O.S.) and World Bank. Primary data used for the study consisted of some bank parameters as Branch Network, Loan to Rural Area, Demand Deposit, Liquidity Ratio, Capital adequacy, and Gross Domestic Product. Ordinary least square was employed in analyzing the data. The overall results of the regression analysis show that inclusive Bank financial activities greatly influenced poverty reduction ($R^2=0.74$) but marginally determined national economic growth and financial Intermediation through enhanced Bank Branch Networks, Loan To Rural Areas, and Loan To Small Scale Enterprise given about 50% relatedness between variables on either sides of the equations.

2.2 Theoretical framework

The earlier theories of economic development/growth recognized labour, capital, institutions, etc., as the factors for economic growth, while the importance of finance for economic growth has been frequently ignored by earlier economists due to existence of Modgillani–Miller theorem and efficient market hypothesis. Both the theories assumed that the market is perfect and there are no frictions, that is, the capital market is perfect. The assumption implies that the investors buy and sell the securities freely in perfect capital market situation without any transaction cost. The assumption that firms and individual investors can borrow and lend at the same rate is not applicable in real world. However, the early theories of economic development also believed in the need for a developed and extensive financial system that could tap savings and thereby channelize the funds for generating a wide spectrum of business activities. Very little work is available on nexus between finance and economic growth. But modern theories of development strongly advocate that financial development is a must because it creates enabling conditions for economic growth through either a ‘supply-leading’ (financial development spurs growth) or a ‘demand-following’ (growth generates demand for financial products) channel (Mohan, 2006). Further, modern development theories also show that the lack of access to finance is a significant factor responsible for persistent income inequality as well as slower rate of economic growth. Moreover, a large body of empirical literature on finance suggests that developing the financial sector and improving access to finance may accelerate economic growth along with a reduction in income inequality and poverty (Kakwani & Pernia, 2000).

3 Methodology

3.1 Model Specification

Panel Vector Auto Regressive model (PVAR)

$$GDP_{it} = ATMs_{it} + CBB_{it} + BA + M2_{it} U_{it} \dots \dots \dots (3.18)$$

Where:

GDP = Gross Domestic Product

ATM = Automated Teller Machine per 100,000 adults

CBB = Bank Branch per 100,000 adults

M2= Money Supply

This Model is adopted from the work of Gretta (2017), Elsharif (2019), Evans (2016) and Mbutor &Uba (2013) with little Modifications

4.3.2 Panel ADF-Fisher and PP-Fisher unit root test

Table 4.3 ADF-Fisher and PP-Fisher unit root test

	Test at level		Test at first difference	
Variables	ADF – Fisher Pv	PP – Fisher Pv	ADF – Fisher Pv	PP – Fisher Pv
RGDP	0.0003*	0.5585	-	0.0096**
ATM	0.8398	0.0000**	0.0009	-
BA	0.9232	0.6439	0.0002**	0.0000**
BB	0.1185	0.1324	0.0208**	0.0000**

Source: Researcher computation using E-views 10.

The asterisks *, ** indicate rejection of the null hypothesis at 10% and 5% level respectively.

Table 4.3 indicates the panel ADF-Fisher and PP-Fisher unit root test, the tests show that real gross domestic product is stationary at level under ADF-Fisher while under PP-Fisher is stationary at first difference. Automated Teller Machines is stationary at level under PP-Fisher while under ADF-Fisher is stationary at first difference. Bank account, bank branch, inflation rate, and money supply are stationary at first difference. i.e they are I(1) process while exchange rate and interest rate are stationary at level i.e they are I(0) process. Based on these tests we can conclude that there is mixture of the order of integration among the variables under study.

4.4 Panel Cointegration

Table 4.4 Kao panel Cointegration Test

ADF t-statistic	Probability
-0.426438	0.3349*

Source: Researcher computation using E-views 10.

Table 4.4 presents the result of Kao residual panel cointegration test. The result confirmed the absence of cointegration amongst the variables in the model as the ADF t-statistics probability value is significant at 1%. Therefore, we cannot reject the null hypothesis and concludes that no long run relationship exists, because the p-value is greater than 5%.

Table 4.13 Panel VAR results

Dependent variable: RGDP

Variables	Coefficient	Standard Error	P-Value
ATM	3.390	2.022	0.095

BA	3.647	1.324	0.047
BB	2.601	9.285	0.063
M2	2.807	4.339	0.079
Heteroskedasticity Test			0.540

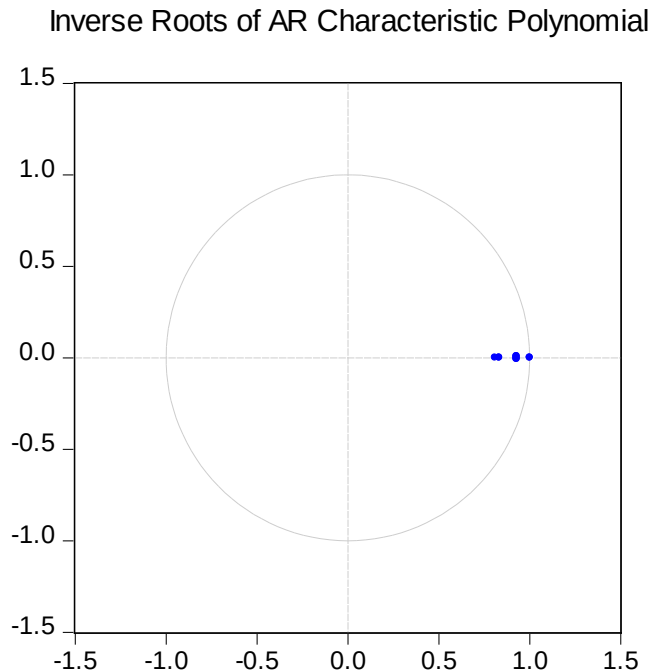
Source: Computed and Compiled by the Researcher using E-Views 10.

In investigating the response of economic growth proxied by GDP from shocks in ATM, BA, BB, and M2, it could be observed that, all the elasticity coefficients, ATM (3.390), BA (3.647), BB (2.601) and M2 (2.807) denotes positive impact on the dependent variable (RGDP) at 95% confidence levels as delineated in Table 4.13. However, the estimation from ATM suggests that at 9.5% increase in the ATM, *ceteris paribus*, will lead to 3.3% increase in GDP; similarly to the other variables, an increase of (4.7%, 6.3%, and 7.9%) in BA, BB and M2 respectively, *ceteris paribus*, will bring about (3.6%, 2.6% and 2.8% increase) respectively.

Chi-Square residual diagnostic test was conducted to test for heteroskedasticity of the Panel VAR. From the VAR model, the joint test result shows that probability of (0.540) is in excess of 0.05 (5% significant level). This lead to the rejection of the presence of heteroskedasticity; implying the residuals are homoscedastic, meaning that, the estimated model is valid and can be used for policy making without re-specification. This finding is in line with Ebenezer, Joshua, Kofi and Agyapomaa (2019)

4.8 Eigen-Value Stability Test Results

Eigen value stability test was carried out to actually ascertain the efficacy and the strength of the panel VAR model. The decision is that the roots should lie inside the unit circle. From the result, all the Eigen-Values lies inside the unit circle and thus satisfy the stability condition of the Panel VAR model as can be seen in figure 4.1. Therefore, in a general note, the above results confirm the fact that the Panel VAR model estimated passed the Eigen-Value stability tests.



Source: Computed by the Researcher using E-Views 10 (2022)

5 Conclusions and Recommendations

- i. The study examines the relationship between Financial Inclusion on Economic growth: Evidence from Panel Data Drawn from a Sample of Developing Countries from 2010 to 2023 and employed the following variables; real gross domestic product, bank branches, Automated Teller Machines, bank account, The panel VAR result shows that Automated Teller Machine, Bank branches, Bank account, and Money supply have positive shocks effects on real gross domestic product in developing countries.

5.3 Recommendations

The study offers the followings recommendations based on the findings:

- i. The central authority should task financial institution to provide more and improved financial services in both rural and urban so that everyone could participate and contribute more to national productivity and achieve higher economic growth in developing economies.
- ii. In taking austerity measures on economy the central authority should not employ only monetary policy but rather a combination fiscal policy in order stabilizes the economy and achieve higher economic growth in developing economies.
- iii. Government should ensure that commercial banks perform perfect banking system and ensure that customers satisfaction are meet in terms of providing varieties of ATM, open new branches, etc. by so doing the economic growth could be achieved in developing countries.

- iv. Full and deepen financial inclusion in societies to capture the vulnerable and rural excluded populace of Nigerian environment. Finally, conventional banks should spread more Auto Teller Machine retail outlet and financial education especially in rural areas.
- v. More and improved financial services should be made available to rural dwellers and the economy in general to help them participate and contribute more to national productivity.
- vi. Monetary authorities should deepen financial inclusion efforts through enhanced credit delivery to the private sector as well as strengthen the regulatory framework in order to ensure efficient and effective resource allocation and utilization.

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