

Financial Development, Economic Growth and Poverty Level in Selected Low-income Sub-Sahara African Countries (1980-2012).

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Abstract: *The study examines the interactions among financial development, economic growth and poverty level in twelve selected low-income sub-Sahara African countries (SSA) between 1980 and 2012. The study employed annual data from 1980 to 2012 obtained from World Bank Development Indicators (WDI). Cointegration test was applied to determine the long run relationship among these three key variables while panel vector autoregression Model analysis was conducted to examine the dynamic interactions among financial development, economic growth and poverty level with particular reference to economic growth as a channel linking financial development and poverty. The evidence obtained in this study shows that increase in financial development reduces economic growth and ultimately increases poverty level in low income countries. This suggests that economic growth is a weak channel connecting financial development and poverty level in all these SSA countries. It is therefore suggested that policy makers should re-design feasible financial sector reforms that would establish sound economic linkages with existing key sectors in these SSA economies which would eventually translate into reduction in poverty level. Of particular importance is the sectoral allocation of credits to key sectors of the economy like energy sector, infrastructural sector, among others.*

Keywords: *Financial Development, Economic Growth, Poverty Level, sub-Saharan African countries (SSA), and Panel Vector Auto regression.*

JEL Classification-O43

I. Introduction

A well-developed financial system is imperative for attaining sustainable and balanced growth as a channel for mobilising idle savings, culminating in efficiency and competitiveness of various sectors in the economy. It also ensures that the population gains access to financial services, improves allocation of financial resources and enhances risk management, facilitates transactions, attracts foreign investments and improves transparency and corporate governance practices (Department for International Development, 2004; Sandrine, 2010). In sub-Sahara African countries, the financial development indicator has been fluctuating around the range of 30% to 35% from 1980 till 2000 (World Development Indicator Database, 2012) while in this new millennium, poverty headcount witnessed reduction from 58.8 in 1996 to 48 in 2010 (Chen and Ravallion, 2007).

Poverty, according to United Nations (1998) is a fundamental denial of choices and opportunities, a violation of human dignity concerning lack of basic capacity to participate effectively in society, insecurity, powerlessness and exclusion of individuals, households and communities, susceptibility to violence, living in marginal or fragile environments, without access to clean water or sanitation. Narayan (2000) defined poverty as lack of material well-being, insecurity, social isolation, psychological distress, lack of freedom of choice and action, unpredictability, lack of long-term horizons, low self-confidence and lack of belief in oneself while Sengupta (2003) described poverty as not only an insufficient income to buy a minimum basket of goods and services but as the lack of basic capabilities to live in dignity.

Poverty headcount in the sub-Saharan African countries has been on the increase since the 1980's. As recorded by World Development Indicator (2012) poverty headcount stood at 53.4 in 1981 and later increased to 55.8 in 1984 before rising to 57.6 in 1990. The highest level of poverty headcount recorded in this region was 58.8 in 1996. This shows that, despite the reforms in the financial sector, introduction of poverty alleviation programme and increase in government spending during this period the poverty rate has always been on the high side. Lately, the poverty headcount has reduced to 50.9 in 2010 but comparing the success recorded in SSA with the rest of the world, there is still a wide gap between poverty rates in sub-Saharan Africa and the rest of the world (Chen and Ravallion, 2007).

Some sub-Saharan African countries implemented economic reforms, structural adjustment supported by international financial institutions causing interest rates liberalization, removal of credit controls, and introduction of indirect monetary policy instruments in the 1980's (Sandrine, 2010). In recent times, other economic reforms such as recapitalization of banks, privatization of unproductive government parastatals, automated trading in the capital market, reinvestment programme, among other reforms, have been implemented

in SSA. In spite of all these, SSA are still characterized by low human capital development, large infrastructure gap, unfavourable investment climate and weak regulatory institutions compared to other countries of the world. The United Nations for food and Agriculture organization estimated that out of 925 million people who were hungry and undernourished worldwide, 239 million of them are in Sub-Saharan African countries (World Hunger Education Service, 2012).

In the quest for increased financial development and reduced poverty level in SSA, it was observed that the efforts have yielded results in some SSA while the reverse was the case in some SSA countries. Broad money supply as percentage of GDP (proxy for financial development) for all income levels in SSA fell by 6.33 percent in 1985 and 3.63 percent in 1990 but rose between 1990 to 1995 by 5.21 percent, it fell by 2.88 percent in 2000 before rising by 8.57 percent and it later fell by 5.86 percent in between 2000 and 2005 later rose by 0.84 percent in 2012. In the case of GDP growth rate, in 1985 gross domestic product fell by 0.3 percent and 0.22 percent in 1990 but rose by 2.48 percent in 1995 later fell by 0.21 percent in 2000, it rose by 2.33 percent in 2005 and fell by 0.95 percent in 2010. It was observed that the growth rates of broad money supply as percentage of GDP and gross domestic product was positive in SSA between 1980 and 2012 but not that significant. The poverty headcount ratio at \$1.25 a day (PPP) as percentage of population declined to 54.9 percent in 2002 from 58.8 percent in 1996 and later declined to about 50.9 percent in 2010 (World Bank and IMF, 2011)

The economic-poverty level situations in some SSA countries are puzzling; for instance Angola, Nigeria and some others; poverty situation in Angola contradicts her economic status. Angola is one of the African's most resource-rich countries representing sub-Saharan Africa's second largest oil producer and the world's fourth largest producer (in value) of diamonds (International Fund for Agricultural Development, 2014). She has a rapid economic expansion over the period of 2003 to 2008 supported primarily by high global oil prices and increased oil production with an average growth rate in gross domestic product (GDP) of about 17 per cent (International Fund for Agricultural Development, 2014). Despite these, Angola is still ranked 148th out of 186 countries on the Human Development Index (HDI) and 68 per cent of the population is living below the poverty line and 15 per cent of households are living in extreme poverty (Rural poverty portal)

In the case of Gabon, there is a wide gap between the poverty level and economic status of Gabon. Despite the fact that Gabon per capita GNI is higher than most sub-Saharan African countries. The country is characterized with weak SME financing system, less than 3% have access to loan resources for long-term investment and high poverty rate (African development bank group). In Lesotho as of 2013, more than half of the population is living below the poverty line. The incidence of poverty has increased by 0.5% from 56.6% in 2002–03 to 57.1% in 2010–11 (Millennium Development Goal Status Report, 2013). Despite the country reform her Public Financial Management, Treasury, and Procurement systems and improve the coordination of aid through programme and sector wide approaches and harmonize donor procedures and reporting. Even the Government ministries embark on programmatic monitoring and evaluation framework so as reduce poverty, yet in 2010–11 the poverty gap for the rural population was 31%, implying that, on average, every poor person would require a 31% increase in income to reach the poverty line (Millennium Development Goal Status Report, 2013). Therefore investigation needs to be done to know if development of financial sector in SSA could bring reduction to the poverty that is facing the countries.

It is observed that the majority of studies in SSA on financial development both at country specific and cross-country level focused on examining the issue of causality between financial development and economic growth without considering their incidence on poverty level. Fazzari, Hubbard and Petersen (1988), Kaplan and Zingales (1997), Moyen (2004) and Becker and Sivadasan (2010) examined the effect of financial development on investment and growth using evidence from Europe without investigating how it can impact on poverty level among the poor. Besides, studies on financial development and poverty in SSA are sparse. The notable one in Nigeria is Fowowe and Abidoye (2012) who investigated the effect of financial development on poverty level but did not investigate the long-run relationship among financial development, economic growth and poverty level in the sub-Saharan African countries. The study was not based on analyzing income groupings which is crucial for drawing policy inferences considering the fact that Sub-sahara African countries are heterogeneous in terms of economic development and income standards. Also the study did not investigate interactions among financial development, economic growth and poverty level in SSA region.

The need to consider this is pertinent because it is possible for a sound financial development to exist amidst increased economic growth and poverty level as obtainable in some economies in sub-sahara African countries. The present study intends to fill these gaps. Hence, this present study investigates economic growth as a channel between financial development and poverty level in SSA countries based on their income classification. To achieve this, the paper is divided into five sections. Besides section one which introduces the paper, section two presents the theoretical basis and the literatures reviewed while the third section presents the methodology. Section four presents the empirical results and section five concludes the paper.

II. Theoretical Framework and Empirical Review

McKinnon and Shaw (1973) analysed the importance of eliminating or reducing the impact of financial repression on domestic financial system within developing countries. The analyses sometimes called the Complementarity Hypothesis; they concluded that allowing market forces mainly to determine real interest rates to alleviate financial restrictions in such countries can exert a positive effect on growth rates as interest rates rise toward their competitive market equilibrium. Base on this tradition, artificial ceiling on interest rates reduce savings, capital accumulation, and discourage the efficient allocation of resources. Moreover, McKinnon stated that Financial Repression can lead to 'dualism' in which firms that have access to subsidized funding will tend to choose relatively capital-intensive technologies; whereas those not favoured by policy will only be able to implement high-yield projects with short maturity.

McKinnon and Shaw assumed that liberalization, which would be associated with higher real interest rates- as controls on these are lifted- would stimulate saving. The underlying assumption is that saving is responsive to interest rates. The higher saving rates would finance a higher level of investment, leading to higher growth.

Empirical studies by Dollar and Kraay, (2000) shows that economic growth reduced poverty level. The study which is based on cross-country regressions has been criticized for deceptive because country-specific experiences can differ widely. Under the surface of aggregate outcomes there are often individual countries that experience an increase in poverty during spells of positive economic growth, at least in the short run, Ravallion (2001), Christiaensen, Demery, and Paternostro (2003) found out that economic policy reforms appear conducive to reductions in poverty; market connectedness is crucial to enable participation in the gains from economic growth; also education and access to land emerge as key private endowment to help households benefit from new economic opportunities (taking both macro and micro perspectives of growth and poverty in Africa).

Also, Deaton (2001) examined the relationship between economic growth and poverty reduction across the world and India in particular. He conducted a regression analysis and concluded that at international level, the regular revision of purchasing power parity exchange rates plays havoc with the poverty estimates, changing them in ways that have little or nothing to do with actual experience of the poor. He opined that, economic growth has at best a weak relationship with poverty as measured which contradicts the propositions of Dollar and Kraay, (2000) and Ravallion (2001) Christiaensen et al (2003).

Ravallion (2001) shifted his investigation from using macroeconomic approach to a more microeconomic approach to the analysis of policies, growth and poverty. Using household survey data in a sample of 50 developing countries and 120 spells of poverty change, he estimated that on average the growth elasticity of headcount poverty is -2.5. But this average masks a great deal of variation across countries-variation related to the level and trends in income inequality.

In contrast, Lustig, Arias and Rigolini (2002) assessed the direction causality between growth and poverty across the world and Latin America in 1980s and 1990s. He observed two-way causality and argued that reducing poverty could help boost economic growth rates. The evidence presented in the paper suggested that pro-growth actions and those directly targeted to improving the lives of the poor were often mutually reinforcing. The more this complementarity is tapped the more effective economic growth can be in reducing poverty. And the more countries do to eliminate constraints that are keeping the poor from being active, constructive partners in society, the greater the potential for growth and efficiency. This supports the claims of Dollar and Kraay, (2000) and Ravallion (2001) Christiaensen et al (2003).

Also a study by Islam (2004) examined the pattern of relationship by examining economic growth, employment and poverty reduction on nexus among twenty-three countries using cross-country data from 1970 to 2002 on nations emerging from crises of various types. Using the methodology of ordinary least squares, among these countries Bangladesh, Bolivia, Ethiopia, India, Indonesia, Uganda, and Vietnam were selected to examine the rate of their GDP growth and poverty reduction. The study found out that there was no invariant relationship between growth and poverty reduction in some countries. The study postulated that the patterns of growth, especially in terms of development in employment and labour markets that took place as a result of growth, played an important role in producing such varying results regarding poverty reduction.

Moreover, Kakwani, Khandker, and Son (2004) findings differ from that of Islam (2004). They examined the interrelation among economic growth, inequality, and poverty in three Asian countries, namely, the Republic of Korea, Thailand, and Vietnam using data from 1990 to 1999 in Korea, 1988 to 2000 in Thailand and 1992/1993 to 1997/1998 in Vietnam. They made use of monotonicity axiom as a key criterion for measuring pro-poor growth. They concluded that, to achieve a rapid poverty reduction, the poverty equivalent growth rate ought to be maximized rather than the actual growth rate.

In contrast to the work of Kakwani, Khandker and Son (2004), Escosura (2005) evaluated the effect of growth and inequality on poverty reduction in Latin America over the long-run. The study was based on sample of 9 countries in Latin America and OECD countries between 1859 and 2000. He found that growth emerged as

the main element underlying the reduction in absolute poverty, and almost exclusively in the second half of the twentieth century.

Furthermore, Agrawal (2008) examined the relationship between economic growth and poverty alleviation in the case of Kazakhstan in central Asian countries using panel data analysis of province-level data 2000 to 2002. Generalized least squares with cross-section weights and different constants for each province (i.e., the fixed effects model) was used. The study showed that provinces with higher growth rates achieved faster decline in poverty. This is in line with studies of Dollar and Kraay, (2000); Ravallion (2001) and Christiaensen, Demery, and Paternostro (2003).

Joseph (2012) studied agricultural growth and poverty reduction in Guinea-Bissau. He assessed the expected effects of the Comprehensive African Agricultural Development Programme (CAADP) on growth and poverty in Guinea-Bissau by performing simulation on a dynamic general equilibrium model. The results revealed that Guinea-Bissau would not achieve the first MDGs goal of eradication of extreme poverty and hunger by 2015 even under the assumption of an implementation of Agricultural investment programme. But only a sustained implementation of CAADP on a longer time framework and a deliberate policy of increased agricultural productivity would allow policy makers to set the economy on a path of growth that would allow the halving of poverty by 2020.

The effect of financial development on poverty reduction was examined by Dhrifi (2013) . A model of simultaneous equations was built on a sample comprising of 89 countries over the period 1990-2011. The model was based on a trilateral relationship connecting growth, inequalities and poverty. The financial development effect on poverty reduction was decomposed into two opposite effects: a growth effect and a disparity one. The findings showed that while the indirect effect of financial development on poverty is not robust and ambiguous, the direct effect of financial development, through the channels of insurance, access to credit services and savings, is robust in reducing poverty. Second, it was also noted that this effect depends on the magnitude and sign of the effects of financial development on inequality and growth. Third, institutional quality is also an important determinant of the relationship between financial development and poverty.

Also, Muritala and Fasanya (2013) studied the critical role that financial inclusion plays in reducing poverty by examining the relationship between sustainable financial services and poverty reduction in Nigeria from 1965-2010 using Error Correction Model (ECM). They found out that total value prime lending rate, financial savings, credit to private sector and rate of inflation have significant impact on the financial deepening. Also, they found that financial inclusion tends to strengthen financial deepening and provide resources to the banks to expand credit delivery thereby leading to financial development.

Aristis and Caner (2009) discussed the channels through which financial liberalization policies might affect poverty. The study was based on economic growth as channel of interaction between Financial Liberalization and poverty. And to a large extent the work was based on the perspective that Financial Liberalization mobilizes savings and allocates capital to more productive uses, both of which help increase the amount of physical capital and its productivity. Also they discovered that trickle-down effect of economic growth accompanied by Financial Liberalization increases income, reduces poverty and improves income distribution. They suggested other three channels that should be added to the list of financial channel to poverty: the financial crises channel, the access to credit and financial services channel, and the income share of labour channel.

The gap in the literature centers on the need to incorporate poverty as a key variable in the relations between poverty, financial development and economic growth; and the need to examine the effect of financial development on poverty level through economic growth channel on the basis of income status prevailing in SSA countries.

III. Methodology

Model Specification

Based on the divergent theoretical postulations established by AK model that economic growth can be conditioned by physical capital , human capital and other critical determinants of growth like financial development , and Mackinnon and Shaw hypothesis suggesting the critical role of financial development as an engine of growth; coupled with empirical revelations that economic growth is causality related to poverty, we specify these interrelations in Panel Vector Autoregression (PVAR) model form.

Panel Vector Autoregression (PVAR) .

For *i*th country at time *t*, the VAR (P) model involves the estimation of the following equation system for aggregate panel level:

$$Y_{i,t} = \Gamma_0 + \Gamma(L)Y_{i,t} + v_i + \varepsilon_{i,t} , \quad i = 1, \dots, N, t = 1, \dots, T \quad (1)$$

Where $Y_{i,t}$ is a (5X1) vector of endogenous variables, Γ_0 is a (5X1) vector of constant, $\Gamma(L)$ is a matrix polynomial in the lag operator L defined as $\Gamma(L) = B_1L + B_2L^2 \dots + B_pL^p$

Hoffmann (2003), B_i is a (5X5) matrix of coefficients, v_i is a matrix of country-specific fixed effects. $\varepsilon_{i,t}$ is a (5X1) vector of normality, identically distributed disturbances.

The components of equation (31) can be explicitly defined as:

$$Y_{it} = \begin{bmatrix} LPov_{i,t} \\ LM_{i,t} \\ LR_{i,t} \\ LK_{i,t} \\ LY_{i,t} \end{bmatrix}, \Gamma_0 = \begin{bmatrix} \mu_{LPov} \\ \mu_{LM} \\ \mu_{LR} \\ \mu_{LK} \\ \mu_{LY} \end{bmatrix}, \Gamma(L)Y_{i,t} = \begin{bmatrix} \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \end{bmatrix} + \begin{bmatrix} LPov_{i,t-p} \\ LM_{i,t-p} \\ LR_{i,t-p} \\ LK_{i,t-p} \\ LY_{i,t-p} \end{bmatrix}$$

and $\varepsilon_{it} = \begin{bmatrix} \varepsilon_{LPov_{i,t}} \\ \varepsilon_{LM_{i,t}} \\ \varepsilon_{LR_{i,t}} \\ \varepsilon_{LK_{i,t}} \\ \varepsilon_{LY_{i,t}} \end{bmatrix} \dots \dots \dots (2)$

Where:

- $lnM_{i,t}$ is log of broad money supply as percentage of GDP at period t, i across the countries.
- $R_{i,t}$ is real interest rate (in constant of \$2000)
- $K_{i,t}$ is capital stock
- $Y_{i,t}$ is real GDP (in constant of \$2000)

Equations 34 can be written in a single equation of the form:

$$\begin{bmatrix} LPov_{i,t} \\ LM_{i,t} \\ LR_{i,t} \\ LK_{i,t} \\ LY_{i,t} \end{bmatrix} = \begin{bmatrix} \gamma_0 \\ \gamma_0 \\ \gamma_0 \\ \gamma_0 \\ \gamma_0 \end{bmatrix} + \begin{bmatrix} \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \\ \beta_{i,t} & \gamma_{i,t} & \theta_{i,t} & \lambda_{i,t} & \delta_{i,t} \end{bmatrix} \begin{bmatrix} LPov_{i,t-p} \\ LM_{i,t-p} \\ LR_{i,t-p} \\ LK_{i,t-p} \\ LY_{i,t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{LPov_{i,t}} \\ \varepsilon_{LM_{i,t}} \\ \varepsilon_{LR_{i,t}} \\ \varepsilon_{LK_{i,t}} \\ \varepsilon_{LY_{i,t}} \end{bmatrix} \dots \dots \dots (3)$$

Equation 3 was estimated to verify if economic growth is a significant channel through which financial development can reduce poverty level (LPov) for the panel of twenty-nine selected sub-Saharan African countries.

Estimation Technique

Panel Unit Root Test Technique

Panel unit root test was conducted to test the stationarity of the series. Panel unit root tests offer the prospect of ameliorating some important weaknesses of existing single time series tests, including low-power and large-size distortions. This is done by employing Levin, Lin Chu (t-statistic), Im, Pesaran and Shin (W-Stat) and ADF-Fisher (Chi-Square) unit root test of order of integration. Levin Lin Chu t-stat with the Null of Unit root (assumes common unit root process), while Im, Pesaran and Shin W-stat, ADF-Fisher Chi-Square: with the Null of unit (assume individual unit root process) Im et al. (2003) test specifies ADF regression for each cross-section as expressed equation 4.

$$y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{\rho_i} \phi_{it} \varepsilon_{it-j} + \delta_i X_{it} + U_{it} \dots \dots \dots (4)$$

where ρ_i is the number of lags in the ADF regression and the error terms U_{it} are assumed to be independently and normally distributed random variables for all i and t with zero means and finite heterogeneous variances σ_i^2 . Both ρ_i and the lag order are allowed to vary among cross-sections. The null hypothesis is that each series in the panel contains a unit root ($\rho_i = 1$ for all i) whereas the alternative hypothesis is that at least one of the individual series in the panel is stationary ($\rho_i < 1$ for at least one i). The test statistic is normally distributed under H_0 and the critical values for given values of N and T is provided in Im et al. (2003).

Panel Cointegration Technique

Pedroni's cointegration test (1999, 2001) allows for cross-sectional interdependence with different individual effects in the intercepts and slopes of the cointegrating equation. This technique significantly improves the conventional cointegration analysis applied on single country series: in fact, data are pooled to determine the common long-run relationship and, at the same time, the cointegrating vectors are allowed to vary across the panel units.

In our empirical estimations, we adopt Pedroni cointegration tests (1999, 2001) and the Johansen cointegration test (1988, 1990) to test for long run relationships among the variables.

The cointegration test is calculated using following regression:

$$\varepsilon_{i,t} = \rho_i \varepsilon_{i,t-1} + u_{i,t}$$

Where $\varepsilon_{i,t}$ is the residual term generated from the regression encompassing the variables of interest i.e. $\log\text{POV}_{it}, \log\text{M}_{it}, \log\text{R}_{it}, \log\text{K}_{it}$ and $\log Y_{it}$; and $\varepsilon_{i,t-1}$ is a period lag residual.

Where the hypothesis is set as: $H_0 : \rho_i = 1$ (There is no cointegration)

$H_1 : \rho_i < 1$ (There is cointegration)

If the residuals $\varepsilon_{i,t}$ are stationary, then $\log\text{POV}_{it}, \log\text{M}_{it}, \log\text{R}_{it}, \log\text{K}_{it}$ and $\log Y_{it}$ are cointegrated, i.e. there is a long-run relationship between them, otherwise long run relationship does not exist.

Sources of data

The data employed in this study were extracted from World Bank African Development Indicators (2012) on 12 sub-Saharan African countries- Benin, Niger, Burkina Faso, Guinea, Burundi, Sierra Leone, Kenya, Liberia, Tanzania, Togo, Ethiopia, and Mozambique. Data on poverty (real per capita consumption expenditure), financial development (M) proxied as broad money supply as percentage of GDP, real interest rate (R) and economic growth proxied as real GDP(Y) and gross capital formation as percentage of GDP (K) were the key variables employed in the study.

Definition and Measurements of variables

Money supply which is a proxy for financial development is the total monetary liabilities, i.e. M_1 or M_2 . The real money supply is obtained by deflating nominal money supply by the consumer price Index. Real income is derived by dividing the total GDP by the consumer price index. Real interest rate is the official money market deflated by price level. It is the maximum bank lending rates. Capital stock is arrived at by gross capital formation as percentage of GDP. Here, financial development is measured by broad money supply as percentage of gross domestic product (M_3/GDP) .

The headcount ratio according to United National Development Programme (2005) is the national population whose incomes are below the official threshold (or thresholds) set by the national government. National poverty lines are usually set for households of various compositions to allow for different family sizes. Where there are no official poverty lines, they may be defined as the level of income required to have only sufficient food or food plus other necessities for survival.

Poverty headcount ratio at \$1.25 a day (PPP) is the percentage of the population living on less than \$1.25 a day at 2005 international price (World Bank, 2011). However, the key weakness in this measure is that it only measures changes of income across the poverty line and ignores shifts below the poverty line. If a poor person becomes poorer, this is not reflected in the headcount index (Roemer and Gugerty, 1997). Due to the unavailability of poverty headcount ratio and other poverty indicator data and the shortcoming of the measure, real per capita consumption expenditure is employed as appropriate measure of poverty in this study. This is obtained by dividing consumption expenditure by countries' population and consumer price index.

IV. Data Analysis and Results

Test statistics and choice of criteria for selecting order of Panel VAR model for low income countries

Table 1 below show the test statistics and the criteria for selecting the order of VAR model for low income countries respectively. The endogenous variables consist of financial development (LM), economic growth (LY) and poverty level (LPOV) in the selected low income countries.

Table 1: Choice Of Criteria For Selecting Order Of Panel VAR Model For Low Income Countries

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-261.4840	NA	0.0025	8.1995	8.3667	8.2655
1	202.3000	841.9463	3.44e-09	-5.3015	-4.2979*	-4.9055
2	246.1867	72.9195	1.95e-09	-5.8826	-4.0428	-5.1567*
3	281.2881	52.9220	1.48e-09*	-6.1934	-3.5173	-5.1375
4	301.1707	26.9180	1.85e-09	-6.0360	-2.5235	-4.6501
5	322.9706	26.1599	2.30e-09	-5.9375	-1.5887	-4.2216
6	342.9213	20.8714	3.23e-09	-5.7821	-0.5971	-3.7363
7pp	388.3010	40.4926*	2.28e-09	-6.4092*	-0.3878	-4.0334
* indicates lag order selected by the criterion						

LR: sequentially modified LR test statistic (each test at 5% level). FPE: Final prediction error

Table 2: Panel Unit Root Test Results

Table 2:Panel	POV_LIC	Δ POV_LIC	LM_LIC	Δ LM_LIC	LR_LIC	Δ LR_LIC	LK_LIC	Δ LK_LIC	LY_LIC	Δ LY_LIC
Levin, Lin Chu t-Stat.	-6.86*	-8.17*	-0.12	-7.90*	-21.22*	11.3	-0.72	-1.82*	1.48	2.98
P-Value	0.00	0.00	0.44	0.00	0.00	100	0.23	0.034	0.93	0.99
Im, Pesaran and Shin W-Stat.	-5.55*	-8.28*	0.62	-10.41*	-3.58*	-2.43	-1.28	-9.434*	0.75	3.24*
P-Value	0.00	0.01	0.73	0.00	0.00	0.00	0.09	0.003	0.22	0.00

NB: (1) AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion

(2) * implies the rejection of the null of non-stationarity (unit root) at 0.05 significance levels. Levin Lin Chu t-stat with the Null of Unit root (assumes common unit root process), while Im, Pesaran and Shin W-Stat, ADF-Fisher Chi-Square, PP-Fisher Chi-square: with the Null of Unit root (assume individual unit root process). Δ implies first difference

Panel Unit Root Test Result

Panel unit root test results are presented table 2. The unit root techniques adopted are the Levin, Ln Chu and Im, Pesaran and Shin. The unit root results show that the series could adequately be regarded as a random walk when they are in their levels but revert to their constant mean level after first differencing all the variables; that is, LPOV_LIC, LM_LIC, LR_LIC, LK_LIC, LY_LIC are stationary after first differencing. We, therefore, reject the null hypothesis (Ho) of non-stationarity for all variables after first differencing.

Cointegration Test Result

The panel cointegration tests applied are the non-parametric variance ratio test, rho non-parametric test, Philips and Peron test and Augmented Dickey Fuller (ADF) test. As a counter-factual check of these cointegration tests, the multivariate Johansen Fisher panel cointegration test was carried out relying on cointegration rank test derived from trace and maximum eigen value. These cointegration tests results are presented in tables 3 and 4.

Table 3: Pedroni Residual panel Cointegration Test results for Low income countries

	Panel statistics			Group statistics		
	V	rho	PP	ADF	rho	PP
ADF						
No trend included	-1.701459*	1.1215504	-5.136880 *	4.799200*	3.032365*	-3.378130* 6.074451*
Trend included	-0.7352621	4.25995**	-3.991141*	6.379548 *	4.125765*	-2.703426* 4.307291*

Note: V is non-parametric variance ratio statistic; rho is non-parametric test statistics analogous to to Philhe Phillips and Perron (PP) rho statistic; PP is non-parametric statistic analogous to the PP statistics and ADF ; ADF is parametric statistic analogous to the augmented Dickey-Fuller statistic.

*null of no cointegration is rejected at the 5 percent level; **null of no cointegration is rejected at the 10 percent level.

Table 3 is computed on the assumptions of the Null Hypothesis of absence of cointegration. Rejection of the null of no cointegration was based on the values of the statistic. A large positive value implies cointegration at 5% significance level. The null of no cointegration is rejected if statistic > 1.645. A large negative value implies cointegration at 5% significance level. A null of no cointegration is rejected if statistic < -1.645. It can thus be inferred that cointegration exists among financial development, real interest rate, capital stock, economic growth and poverty level in low income countries.

Table 4: Johansen Fisher Panel Cointegration Test for low income countries Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized	Fisher Stat.*	Prob.	Fisher Stat.*	Prob.
No. of CE(s)	(from trace test)		(from max-eigen test)	
None	86.91**	0.0000	70.19**	0.0000
At most 1	98.64**	0.0036	91.96**	0.0000
At most 2	48.24**	0.0788	44.74**	0.0000
At most 3	28.44**	0.0232	19.52**	0.0341
At most 4	26.43	0.0732	26.43	0.0932

Note: Table 4 depicts a case of rejection of the null of at least three cointegrating equations but an acceptance of the alternative hypothesis of at least four cointegrating equations on the bases of both the trace and max-

eigen tests. In sum, evidence from cointegration tests indicates rejection of the null of no cointegration at 5 per cent level, thus long run relationship exists among the model variables.

Panel Impulse Response Analysis

Impulse-response functions (IRFs)

For the purpose of examining the effects of shocks to the adjustment path of financial development, economic growth and poverty level (real per capita consumption expenditure), the IRFs estimated from the panel VAR models were used as analytical tool. Table 5 shows the estimated IRFs when non recursive identification is used. The IRFs indicate the direction and size of the effect of one standard deviation shock to one variable on other system variables over time.

Table 5: The forecast impulse response from the Panel VEC model for low income countries

Response of POV_LIC to:					
Period	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	0.2029	0.0000	0.0000	0.0000	0.0000
4	0.3356	-0.0863	-0.0316	-0.0231	0.0682
8	0.4431	-0.1060	-0.0935	-0.0111	0.1048
12	0.4799	-0.1025	-0.1240	-0.0039	0.1187
16	0.4953	-0.0983	-0.1372	-0.0006	0.1220
20	0.5012	-0.0966	-0.1425	0.0010	0.1233
Response of LM_LIC:					
Period	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	-0.0022	0.0947	0.0000	0.0000	0.0000
4	-0.0288	0.1126	-0.0300	0.0179	0.0038
8	-0.0297	0.1235	-0.0354	0.0246	-0.0008
12	-0.0359	0.1219	-0.0335	0.0255	0.0018
16	-0.0381	0.1217	-0.0319	0.0248	0.0016
20	-0.0384	0.1218	-0.0314	0.0246	0.0011
Response of LY_LIC:					
Period	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	0.1857	-0.0149	0.0063	-0.0036	0.0606
4	0.3491	-0.1100	-0.0326	-0.0287	0.1157
8	0.4736	-0.1268	-0.1008	-0.0201	0.1507
12	0.5188	-0.1216	-0.1369	-0.0112	0.1645
16	0.5361	-0.1174	-0.1522	-0.0070	0.1690
20	0.5426	-0.1155	-0.1582	-0.0052	0.1707

The interpretation would rely more heavily on the signs than on the magnitude of the estimated coefficient because the magnitude shows the statistical influence while the signs provide the relevant information for the analysis of the impact.

From table 7 panel 1, a shock to poverty level (POV_LIC) proxied by real per capita consumption expenditure had positive impact on poverty level in the short and long runs. The estimated coefficient was positively signed in period 1 and it maintained this trend through to the end of the forecast horizon, indicating expansionary nature of real per capita consumption expenditure (poverty level) over time. Hence, given all other endogenous factors in the model, real per capita consumption could be expansionary in the short and long runs.

A shock to financial development (LM_LIC) - proxy for broad money as percentage of GDP- would produce no immediate effect on real per capita consumption (poverty level) but its effect in the medium and long runs would be negative. The estimate assumed zero value in period 1 and it also exhibited a negative sign between periods 4 and 20. This shows that an increase in financial development reduces real per capita consumption, thus increases the poverty level both in middle and long runs in low income countries. A shock to real interest rate (LR_LIC) would produce a negative effect on real per capita consumption (poverty level) in middle and long runs. The estimate assumed zero value in period 1 signaling no effect. The coefficient was negative (-0.86) in period 4 and it maintains this sign through to the end of period 20. This indicates medium and long run contractionary effect of real interest rate on real per capita consumption (poverty level). Increase in real interest rate reduces real per capita consumption but increases poverty level in low income countries.

A shock to capital stock would produce no immediate effect on poverty level in the short run but its effect in the middle, long run would be negative and turn positive at the end of the time horizon. The estimate assumed zero value in period 1 and it also exhibited a negative sign between periods 4 to 16 and positive in period 20. It averaged 0.001, this indicates that increase in capital stocks reduces real per capita consumption, thus increases the level of poverty in medium and long run but in the end of time horizon increases real per capita consumption thus reduces the poverty level.

Furthermore, a shock to economic growth (real GDP) would produce no immediate effect on poverty level but its effect in the medium and long run would be positive. The estimate assumed zero value in period 1,

also the coefficient is positively signed between period 4 and 20. Thus an increase in economic growth would tend to increase real per capita consumption then reduce the poverty level. The result is consistent with existing studies like Agrawal (2008), Dollar and Kraay (2000), Ravallion (2001) and Christiaensen, Demery and Paternostro (2003) who asserted that economic growth reduces poverty level

We note from panel 2 that a shock to real per capita consumption (POV_LIC) had a negative effect on financial development (LM_LIC) proxy by broad money as percentage of GDP, both in the short and long runs. The estimate coefficient was negatively signed in period 1 and retains this sign till the end of the time horizon. Hence, an increase in real per capita consumption would reduce poverty level and, thus, reduce financial development.

Also, a shock to financial development would produce positive effect on actual financial development in all period (short, medium and long runs). This indicates short, medium and long runs expansionary effect. A shock to real interest rate had no effect on financial development in period 1 as the value of estimate was zero (0.00). The estimate assumed negative value in other periods. This shows inverse relationship between broad money supply as percentage of GDP and interest rate in medium and long runs. Thus, an increase in real interest rate would lower the financial development.

A shock to capital stock had no effect on financial development in period 1 as the estimated coefficient assumed zero (0.00) value. The coefficient of estimate was positive in period 4 to 20. This signals the expansionary effect of capital stock on financial development in medium and long runs. This indicates that increase in capital stock would tend to increase the financial development. Moreover, a shock to economic growth had no effect on financial development in period 1 as the estimated coefficient assumed zero (0.00) value. The coefficient of estimate was negative in period 8 and positive in the other periods. This indicates that an increase in economic growth would increase financial development both in medium and long runs.

From the panel 3, we note that a shock to poverty level proxy by real per capita consumption had positive effect on economic growth in all periods. The estimated coefficient assumed positive values of 0.19 and 0.54 in the periods 1 and 20, respectively. This indicates short, medium and long runs expansionary effect. A shock to financial development had negative on economic growth throughout the periods. The estimated coefficient assumed negative values of 0.01 and 0.12 in the periods 1 and 20 respectively. This indicates a contractionary effect on economic growth in the short, medium and long runs. Moreover, a shock to real interest rate (LR_LIC) would produce positive effect in period 1 and negative effect in period 4 to 20. The estimated coefficient assumed positive value of 0.01 and negative value of 0.16. This shows that an increase in interest rate would tend to increase economic growth in the short run but would reduce economic growth in the long run. Also, a shock to capital stock would produce a negative effect on economic growth in periods 1 to 20. This indicates a contractionary effect on economic growth in short, medium and long runs.

In addition, a shock to economic growth had positive effect on actual economic growth in all periods. The estimated coefficients assumed positive values of 0.06 and 0.17 in periods 1 and 20. This shows that an increase in economic growth would tend to increase the more subsequent economic growth.

Forecast error Variance Decompositions of financial development, economic growth and poverty level for Low income countries

Table 6 presents the results of panel forecast error variance decomposition of financial development, economic growth and poverty level variables over 20 horizon period divided into quarterly intervals. The table is divided into three panels. Panel 1 relates to variance decomposition of poverty variable while panels 2 and 3 relate to variance decompositions of financial development and economic growth variables.

Table 6: Panel Forecast Error Variance Decompositions.

Variance Decomposition of POV_LIC:						
Period	S.E.	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	0.2029	100.0000	0.0000	0.0000	0.0000	0.0000
4	0.5646	89.3528	5.4492	0.4210	0.2808	4.4959
8	1.0471	87.2250	5.6681	2.1085	0.1631	4.8351
12	1.4565	86.3959	4.9744	3.5473	0.0941	4.9880
16	1.8041	85.94708	4.4568	4.4952	0.0619	5.0389
20	2.1050	85.6637	4.1266	5.0980	0.0455	5.0660
Variance Decomposition of LM_LIC:						
Period	S.E.	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	0.0948	0.0550	99.9449	0.0000	0.0000	0.0000
4	0.2220	3.4644	88.1688	5.5664	2.0651	0.7350
8	0.3442	4.2450	85.7661	6.6418	2.9521	0.3949
12	0.4360	5.2681	84.6987	6.5683	3.2047	0.2599
16	0.5117	5.9814	84.1913	6.3588	3.2758	0.1925
20	0.5776	6.4497	83.9004	6.1909	3.3060	0.1527
Variance Decomposition of LY_LIC:						

Period	S.E.	POV_LIC	LM_LIC	LR_LIC	LK_LIC	LY_LIC
1	0.1960	89.7191	0.5829	0.1051	0.0350	9.5577
4	0.6021	81.8711	7.0975	0.3491	0.4224	10.2597
8	1.1398	81.7536	6.8549	2.0234	0.2975	9.0704
12	1.5963	81.7261	5.9018	3.5150	0.1850	8.6719
16	1.9831	81.6442	5.2577	4.4951	0.1272	8.4756
20	2.3173	81.5674	4.8555	5.1155	0.0956	8.3658
Cholesky Ordering: POV_LIC LM_LIC LR_LIC LK_LIC LY_LIC						

Panel 1 in table 6 depicts the proportion of forecast error variance in poverty level in low income countries of SSA explained by innovations to the endogenous variables considered. The four variables that appear crucial in determining the variations in POV_LIC are LM_LIC, LR_LIC, LK_LIC and LY_LIC. The magnitude of POV_LIC reduced from 100 per cent in the 1st period to 83.4 per cent in the 20th period. This indicates that poverty level explained between 100 and 83.4 per cent of its own innovations overtime.

The magnitude of broad money supply as percentage of GDP proxy for financial development (LM_LIC) innovations increased from 0.00 per cent in period 1 to 4.1percent in period 20. This indicates that financial development explained between 0.00 and 4.1 per cent of variation in real per capita consumption expenditure proxy for poverty level POV_LIC which appears to be low. The magnitude of real interest rate LR_LIC varied between 0.00 per cent in period 1 and 5.1percent in period 20. This indicates that real interest rate explained between 0.00 and 5.1 percent of variation in poverty level. The magnitude of gross capital formation as percentage of GDP (proxy for capital stock) (LK_LIC) increased from 0.00 percent in period 1 to 0.05.This indicates that real GDP explained between 0.00 and 0.05 percent of variation in real per capita consumption expenditure (proxy for poverty level). The real GDP (proxy for economic growth) increased from 0.00 percent and 1 to 5.1 in period 20. It can thus be inferred that, apart from real per capita consumption expenditure POV_LIC, both real interest rate and real GDP have the potential to contribute to variations in poverty level in the long run.

The second panel in Table 6 shows the proportion of forecast error variance in broad money supply as percentage of GDP (proxy for financial development, LM_LIC) explained by innovations to the considered endogenous variables. The five variables that appear important in determining the variations in LM_LIC are: POV_LIC, LM_LIC, LR_LIC, LK_LIC and LY_LIC. The magnitude of real per capita consumption expenditure POV_LIC increased from 0.06 percent in period 1 and 6.4 percent in period 20. This indicates that real per capita consumption expenditure explained between 0.06 and 6.4 percent of the variation in broad money supply as percentage of GDP overtime.

Furthermore, the contribution of broad money supply as percentage of GDP LM_LIC varied between 99.9 percent in period 1 to 83.9 in period 20. That of real interest rate (LR_LIC) was 0.00 percent in period 1 and this increased to 6.19 percent in period 20. In addition, the contribution of gross capital formation as percentage of GDP LK_LIC increased from 0.00 percent in period 1 to 3.3 percent in period 20. The magnitude of the contributions of real GDP (LY_LIC) increased from 0.00 percent in period 1to 0.15 percent in period 20. This indicates that real GDP explained between 0.00 percent and 0.15 percent variation in financial development. It can thus be inferred that, apart from broad money supply as percentage of GDP LM_LIC, real per capita consumption expenditure (proxy for poverty level) POV_LIC has greater potential to contribute to broad money supply as percentage to GDP (proxy for financial development).

The third panel in Table 6 shows the proportion of forecast error variance in real GDP as proxy for economic growth (LY_LIC) explained by shocks to the endogenous variables considered. The five variables that appeared important in determining the variations in LY_LIC are POV_LIC, LM_LIC, LR_LIC, LK_LIC and LY_LIC. The magnitude of real per capita consumption expenditure POV_LIC decreased from 89.7 percent in period 1 to 81.56 percent in period 20. This indicates that real per capita consumption expenditure POV_LIC explained between 89.7 and 81.56 percent of variation in real GDP (proxy for economic growth). The magnitude of LM_LIC increased from 0.5 percent in period 1to 4.8 percent in period 20 indicating that broad money supply as percentage of GDP explained between 0.5 and 4.8 percent of innovations in real GDP (proxy for financial development).

The magnitude of LR_LIC increased from 0.11 percent in period 1 to 0.34 percent in period 4 and increased further to 5.11 percent in period 20. This indicates that real interest rate explained between 0.11 and 5.11percent variations in real GDP LY_LIC proxy for economic growth. The magnitude LK_LIC increased from 0.03 percent in period 1 to 0.09 percent in period 20. This indicates that gross capital formation as percentage of GDP explained between 0.03 and 0.09 percent variation in real GDP LY_LIC proxy for economic growth. The magnitude of LY_LIC decreased from 9.56 percent in period 1 to 8.36 percent in period 20. This indicates that real GDP contributed less than 10 percent of its own variation and its effect declined overtime. Thus, it can be inferred that real per capita consumption expenditure proxy for poverty level explained more of variation in real GDP proxy for economic growth in the long run even more than real GDP itself.

VEC Granger Causality/ Block Exogeneity Wald Tests.

Table 7 shows the results of VEC Granger Causality/Block Exogeneity Wald Tests estimated for low income countries.

Table 7: Results of VEC Granger Causality/Block ExogeneityWald Tests for low income countries.

Dependent variable: D(POV_LIC)			
Excluded	Chi-sq	Df	Prob.CAUSALITY DIRECTION
D(LM_LIC)	4.543695	2	0.1031
D(LR_LIC)	0.842308	2	0.6563
D(LK_LIC)	0.839504	2	0.6572
D(LY_LIC)	8.008705	2	0.0182* LY_LICto POV_LIC
All	19.13311	8	0.0142
Dependent variable: D(LM_LIC)			
Excluded	Chi-sq	Df	Prob.CAUSALITY DIRECTION
D(POV_LIC)	8.280146	2	0.0159*POV_LIC to LM_LIC
D(LR_LIC)	0.524090	2	0.7695
D(LK_LIC)	1.797692	2	0.4070
D(LY_LIC)	3.475757	2	0.1759
All	12.01488	8	0.1505
Dependent variable: D(LY_LIC)			
Excluded	Chi-sq	Df	Prob.CAUSALITY DIRECTION
D(POV_LIC)	0.288190	2	0.8658
D(LM_LIC)	4.731675	2	0.0939*LM_LIC to LY_LIC
D(LR_LIC)	2.159514	2	0.3397
D(LK_LIC)	0.752813	2	0.6863
All	9.985952	8	0.2660

Chisqr, 0.05,2 =5.99; Chisqr, 0.05, 8= 15.51 (statistical table)

Note:. indicates significant at 5 per cent significance level.*

If the long run relationship is established, there must definitely be some forms of causal relationship among the variables. We therefore investigated the relations within the framework of Vector Error Correction model (VECM). These results contained in table 7 show that there is bi-directional causality running between poverty level and economic growth. This pattern of relationship has been well documented in the literatures (Dollar and Kraay, 2000; and Ravallion, 2001; Christiaensen, et al 2003). The results also show that financial development granger-causes economic growth in low-income countries. Although the results of impulse response analysis show that financial development is a weak channel between economic growth and poverty level in low-income countries, it can be inferred that financial development has huge potentials if well directed towards achieving real output growth (economic growth) in low income countries.

V. Conclusion and Policy Implications

The evidence obtained in this study shows that financial development is not well aligned with economic growth, although it has great potentials to enhance growth if well designed in low-income countries. This suggests that financial development may not be a reliable instrument to impact on poverty level through economic growth in its present state unless it undergoes some fundamental restructuring that is growth-inducing leading to poverty reduction in low-income SSA countries. It is equally established that economic growth is a valid channel linking financial development and poverty level in low income countries of SSA countries. However, the fact that financial development is having tenuous impact on economic growth in the present case tends to suggest that there is the possibility of some other factors that could impact on economic growth other than financial development as sub-Saharan Africa still experienced increased economic growth within this period.

Based on the findings of this study, the policy makers in the low-income SSA countries should re-design their financial policy strategies, particularly the banking policies, to position the financial institutions adequately towards contributing to boosting economic growth which would ultimately translate to poverty reduction. For instance, policy makers could re-design policies related to bank portfolio restructuring directed at boosting priority sectors in the low- income countries. Also, there is the need to channel Central Bank’s sovereign fund towards salvaging failed financial institutions in these economies to enhance their potentials to contribute to economic growth..

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