

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/281897420>

Financial Globalization and Economic Growth in Sub-Saharan Africa: Evidence from Panel Cointegration Tests

Article in *African Development Review* · September 2015

DOI: 10.1111/1467-8268.12140

CITATIONS

10

READS

296

2 authors:



Tajudeen Egbetunde

Federal University of Technology, Akure

17 PUBLICATIONS 130 CITATIONS

[SEE PROFILE](#)



Anthony Enisan Akinlo

Redeemer's University

44 PUBLICATIONS 1,441 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



STOCK MARKET DEVELOPMENT AND GROWTH IN NIGERIA: A CAUSAL ANALYSIS [View project](#)



Non-linear analysis of government spending and economic growth in Nigerai [View project](#)

Financial Globalization and Economic Growth in Sub-Saharan Africa: Evidence from Panel Cointegration Tests

Tajudeen Egbetunde and Anthony Enisan Akinlo*

Abstract: This paper examines the long-run relationship between financial globalization and economic growth in sub-Saharan Africa using panel unit root tests, panel cointegration tests and panel multivariate ECM. The study finds that the variables are stationary at first difference — $I(1)$. Also, the results reveal that all the variables are cointegrated, that is, they are related in the long run. The results of the ECT test within the framework of panel multivariate ECM confirm the cointegration tests. The paper concludes that there is a long-run relationship between financial globalization and economic growth in sub-Saharan Africa. The paper argues that sub-Saharan African economies will benefit from the era of financial globalization in the long run in as much as the governments promote and encourage sound macroeconomic policies and strong institutions.

1. Introduction

Sub-Saharan African countries received considerable volumes of international financial flows (the volumes accounted for US \$966.73 million in 1985, US\$4.53 billion in 1995, US\$19.49 billion in 2005 and US\$27.15 billion in 2010), mirroring the steep rise in capital flows to other emerging and developing countries in the middle of the past decade. Although such flows briefly reversed during the apex of the crisis, very low interest rates in advanced countries and an attenuation of global risk aversion have once again prompted investors to scour the globe in search of attractive investment opportunities (IMF, 2011).

The volume of international financial flows in sub-Saharan Africa was extensively revealed in World Economic and Financial Surveys of IMF, 2011. It was argued that during the last two decades, external sources of funding for investment and growth in sub-Saharan Africa have undergone a noteworthy transformation. First, a six-fold increase has occurred in total flows, especially since 2000. Second, in sharp departure from the previous decade, most of the increase has come from the private sector, even when excluding South Africa and Nigeria (these two large countries typically account for 50 to 60 per cent of total flows). Inflows from private capital in the form of both foreign direct investment (FDI) and portfolio flows have increased rapidly, although not all countries in sub-Saharan Africa have participated equally in this transformation, particularly in the ability to attract portfolio inflows. The same trend has occurred in transfers, whereby remittances have overtaken official transfers (grants) that have been declining during the past decade. Total net private inflows amounted to about US\$41 billion in 2010, with South Africa accounting for more than 40 per cent of the total. However, there is need to examine the impact of financial globalization on economic activities in sub-Saharan Africa.

The recent wave of financial globalization since the mid-1980s has been marked by a surge in capital flows among industrial countries and, more notably, between industrial and developing countries. While these capital flows have been associated with high growth rates in some developing countries, a number of countries have experienced episodic collapses in growth rates and significant financial crises over the same period, crises that have enacted a serious toll in macroeconomic and social costs. As a result, an intense debate has emerged in both academic and policy circles about the effects of financial globalization on developing economies.

With respect to this debate, Prasad *et al.* (2007) argue in their analysis that the macroeconomic effects of financial globalization are sobering but in many ways informative from a policy perspective. They contend that it is true that many developing economies with a high degree of financial integration have experienced higher growth rates. They further argue that it

*Tajudeen Egbetunde (PhD), Department of Economics and Financial Studies, Fountain University, Osogbo, Nigeria; e-mail: tajuegbetunde@yahoo.com. Anthony Enisan Akinlo (PhD), Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria; e-mail: aakinlo@oauife.edu.ng

is also true that, in theory, there are many channels by which financial openness could enhance growth. However, a systematic examination of the evidence suggests that it is difficult to establish a robust causal relationship between the degree of financial integration and output growth performance. It is important to investigate channels by which financial globalization could enhance growth in sub-Saharan Africa (SSA). This study covers a period of 1980 to 2013.

The paper is organized as follows: Section 2 provides the literature review; Section 3 presents methodology; Section 4 discusses the empirical results; and Section 5 provides concluding remarks.

2. Literature Review

This study begins with the basic theoretical arguments about how financial globalization should affect growth. The neoclassical growth model suggests that financial globalization could lead to flows of capital from capital-rich economies to capital-poor economies because, in the latter, the returns to capital should be higher. In theory, these financial flows should complement limited domestic saving in capital-poor economies and, by reducing the cost of capital, allow for increased investment. Certain types of financial flows could also generate technology spillovers and serve as a conduit for imbibing managerial and other forms of organizational expertise from more advanced economies.

Newer analyses emphasize the importance of indirect channels arguing that it is not just the direct financial flows, but the collateral benefits of these flows that drive the growth benefits of financial globalization (see Kose *et al.*, 2006). These indirect channels include improvements in institutions (defined broadly to include governance, the rule of law etc.) and better macroeconomic policies.

Mishkin (2006) examines how opening financial markets to foreigners promotes financial development. He argues that globalizing the domestic financial system by opening financial markets to foreigners encourages financial development and growth, that is, opening financial markets to foreign capital directly increases access to capital and lowers its cost for those with productive investments. Recent research has shown that when some countries opened up to international capital markets too soon in the absence of some basic supporting conditions, vulnerabilities to sudden stops of capital flows increased. Thus, some preconditions must exist with respect to a minimum level of institutional quality, financial market development, and macroeconomic stability before financial globalization can further improve financial market and institutional development (Eichengreen, 2001; Klein, 2005; Alfaro *et al.*, 2004). Stulz (2005) focuses on institutional quality and concludes that globalization weakens certain agency problems by reducing the cost of outside finance, thereby creating incentives for firms that use more external finance to improve their governance. Gourinchas and Jeanne (2005) contend that financial globalization can impose discipline on macroeconomic policies by improving the benefits of good policies and catalyzing political support for reforms while Bartolini and Drazen (1997) argue that, in exposing itself to such costs through increased financial openness, a country may signal its commitment to better macroeconomic policies.

Svrtinovic *et al.* (2013) assert that financial globalization creates tremendous potential benefits for developing countries and emerging markets, as they integrate financially with the rest of the world. They argue further that globalization stimulates the development of the financial sector and, in turn, spurs the advancement of economies. On the other hand, financial globalization also carries some risks. One well-known risk is that globalization can be related to financial crises.

The effects of financial globalization on output volatility are ambiguous. Financial globalization allows capital-poor countries to diversify away from their narrow production bases that are often agricultural or natural-resource dependent, thereby reducing macroeconomic volatility. At a more advanced stage of development, however, trade and financial globalization could together allow for enhanced specialization (Kose *et al.*, 2009a). This could make middle-income developing countries more vulnerable to industry-specific shocks and thereby lead to higher output volatility (see Kose *et al.*, 2004). If financial globalization takes the form of heavy reliance on external debt, it could expose these countries to world interest rate shocks and, thus, to higher output volatility.

Kose *et al.* (2009b), using descriptive statistics, found a positive association between embracing financial globalization and economic growth. They further reported that emerging market economies experienced far higher cumulative growth since 1970 than other developing countries or even industrial countries.¹ Klein (2005) using panel OLS of 71 countries, found that the effect of capital account liberalization on economic growth varies with institutional quality. He also found that there is a strong correlation between institutional quality and income per capita, and the countries that tend to benefit significantly from capital account liberalization are mostly upper-middle-income countries.

Wei (2006) using a panel OLS for 179 countries, found that financial globalization did not lead to an automatic improvement in many developing countries.² Wei further reported in his findings that the threshold and composition effects can be closely

related (two sides of the same coin). But recent evidence suggests that better institutional quality in a capital-importing country may lead to a more favourable composition of capital inflows for that country. The earlier literature did not disentangle possibly different effects of financial development and quality of bureaucratic institutions. Indeed, by not separating the two types of institutions, the earlier literature reported mixed evidence on the relationship between quality of institutions and the composition of capital inflows. Wei's findings furnish evidence that these two types of institutions can indeed have different effects on the structure of capital inflows. In particular, bad public institutions strongly discourage foreign direct investment (FDI), and possibly foreign debt, in shares of a country's total foreign liabilities, but appear to encourage the relative prominence of borrowing from foreign banks. In comparison, low financial sector development discourages inward portfolio equity flows but encourages inward FDI. Therefore, views on the connection between domestic institutions and the structure of international capital flows have to be nuanced.

Moreover, Eregha (2012) examined the crowding out or crowding in effect of FDI inflow on domestic investment in Africa and employed a recent panel cointegration estimation technique. He found that FDI inflow crowds out domestic investment in the ECOWAS region and recommended that policy-makers in the ECOWAS countries should focus on promotional resources to attract some types of FDI and regulate others. He further recommended that policies should also be directed at putting in place a better targeted approach to screen FDI applications to ascertain their productive base before allowing them. Inekwe (2013) asserted that FDI in the servicing sector had a positive relationship with economic growth while FDI in the manufacturing sector had a negative relationship. He further reported that FDI in the manufacturing sector had a positive relationship with employment rate while FDI in the servicing sector had a negative relationship with employment rate, and also found that causality runs from growth to FDI in the service sector while growth and FDI in the manufacturing sector have bidirectional causal effect. His study is only limited to the Nigerian economy. In another study, Tchereni *et al.* (2013) found that foreign debt had a statistically insignificant and negative impact on economic growth in Malawi. They recommended that the country should strive to provide incentives to local manufacturers who would want to export rather than relying on borrowing for growth inducement.

Friedrich *et al.* (2010) found that the European transition region benefited much more strongly from financial integration in terms of economic growth than other developing countries since the late 1990s. The effect of financial globalization on growth is not only statistically significant, but also economically important. Hence, the experience of emerging Europe seems to conform to neoclassical growth theory, which predicts that openness to foreign capital should allow countries to grow faster towards their steady state income levels. On the other hand, Aryeetey and Ackah (2011) has noted that the global financial and economic crisis has affected African economies in a significant way, mostly indirectly through the harm it causes to the real sectors of the economies. They argued further that, in aggregate terms, the impact has been quite strong, as shown by the sharp drop in aggregate output around the region. Even though there are both direct and indirect channels for transmitting the crisis to African economies from the rest of the world, the indirect channels have been more pronounced in their effects largely on account of the structures of these economies. They also contended that the integration of these economies into the global economy has been largely on account of trade in goods and also the consequence of migration, hence the effects on the real sectors and in remittance flows. They also reported that there have been significant variations in the impact of the crisis across countries, and this has been influenced largely by the quality of institutions, particularly for regulation, and initial conditions prevailing in the countries.

Kunieda *et al.* (2011) using panel GMM, found that highly corrupt countries impose higher tax rates than do less corrupt countries, thereby magnifying the negative impacts of government corruption on economic growth in the highly corrupt countries and reducing the impacts in the less corrupt countries if capital account liberalization is enacted. Schularick and Steger (2006), using dynamic panel system GMM, found that the new data set allows their results to show that—in quite stark contrast to the ambiguous findings of contemporary research—international financial globalization had a statistically significant and robust effect on growth in the first era of global finance. They also reported from their findings that currency stability and low interest rates in the core economies might have been an important factor contributing to stable and long-term capital flows from rich to poor. The findings further revealed that institutions and political factors might have created an environment more supportive for capital accumulation to translate into higher economic growth.

Anyanwu (2014) investigated the determinants of economic growth in Africa using an Africa-only sample with five non-overlapping three-year averages of cross-sectional data between 1996 and 2010. He found that domestic investment, net ODA inflows, education, government effectiveness, urban population, and metal prices positively and significantly affect Africa's economic growth. Nsiah and Wu (2014) argued that while the study of the determinants of FDI to Africa has attracted some attention, the possible impact of neighbouring nations on proximate nation's ability to attract FDI has largely been ignored. The omission of spatial effects regardless of estimation methodology may lead to biased estimates. They used panel data on African countries and tested for local spatial linkages in FDI inflows to Africa. They found that all proximity weights generate

statistically significant spatial linkages except for the case where the weight is a combination of regional trade agreements and distance. Tumwebaze and Ijjo (2015) examined the contribution of COMESA integration to economic growth in the region using instrumental variables GMM regression in the framework of a cross-country growth model. They found no significant empirical support for a positive growth impact on the region from the integration. They argued that growth in capital stock, population, world GDP and the level of openness to international trade turned out to be the most robust drivers of growth in the COMESA region over the period.

The concern that financial globalization can sometimes spin off negative side effects in highly distorted developing economies is a legitimate one, though not necessarily debilitating. Indeed, as we shall see, in light of the ambiguity of theoretical findings, the critical question in this entire literature is whether empirical evidence can guide us on why financial globalization seems to have clearly positive effects in some cases, whereas it appears to be counterproductive in others. In the light of the above assertions, the nexus between financial globalization and economic growth in sub-Saharan Africa needs to be examined for effective and adequate policy-making in the region.

3. Methodology and Materials

To investigate the relationship between growth and financial globalization, following Schularick and Steger (2006) we use the model below:

$$y_{it} = \beta_1 + \beta_2 k_{it} + \beta_3 iq_{it} + \beta_4 to_{it} + \beta_5 fd_{it} + \beta_6 if_{it} + \beta_7 in_{it} + \varepsilon_{it} \quad (1)$$

where y_{it} equals real gross domestic product in country i at period t ; k_{it} equals financial globalization indicators in country i at period t ; iq_{it} indicates institutional quality index in country i at period t ; to_{it} equals trade openness in country i at period t ; fd_{it} equals financial development indicator in country i at period t ; if_{it} equals inflation rate in country i at period t ; in_{it} equals interest rate in country i at period t ; and ε_{it} equals error correction terms. Institutional quality, trade openness, financial development, interest rate and inflation are vector of control variables. These control variables are also key determinants of real GDP in the study of the financial globalization–growth nexus (see Eichengreen *et al.*, 2009; Quinn and Toyoda, 2008; Schularick and Steger, 2006; Luca and Spatafora, 2012). Since the direction of causality is not clear we also specify the model:

$$k_{it} = \alpha_1 + \alpha_2 y_{it} + \alpha_3 iq_{it} + \alpha_4 to_{it} + \alpha_5 fd_{it} + \alpha_6 if_{it} + \alpha_7 in_{it} + \varepsilon_{it} \quad (2)$$

Both equations are to be considered as long-run, or equilibrium, relations. We may, of course, have more cointegrating relations involving institutional quality, trade openness, financial development, inflation or interest rate as the dependent variable. Provided all variables involved are integrated of order one, or $I(1)$, valid economic inferences can be drawn only if these relations (or perhaps more, having institutional quality, trade openness, financial development, inflation or interest rate as dependent variable) are cointegrating relations, otherwise spurious inferences would result (Christopoulos and Tsionas, 2004). We use data for 21 countries in sub-Saharan Africa, namely Botswana, Burundi, Cameroon, Central African Republic, Chad, Congo, Gabon, Gambia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Nigeria, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Togo and Zambia.³ The data cover the period 1980 to 2013.

Regarding financial globalization, Kose *et al.* (2009b) argue in favour of quantity-based, *de facto* measures and the early literature had used mostly *de jure* measures, such as those based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). However, such measures do not fully capture the degree of enforcement and effectiveness of capital controls as well as regulations in other fields that affect capital flows. In addition, domestic financial markets might not be liquid enough to efficiently diminish price differentials, so that price-based measures may underestimate the true degree of financial integration. Therefore, quantity-based measures were used in this study. Following the study of Friedrich *et al.* (2010), this paper used three indicators of *de facto* financial globalization. First, we use the standard measure of gross financial globalization, defined as the sum of total foreign assets and total foreign liabilities in percent of GDP (FAL) and sourced from International Financial Statistics (IFS), 2013. Gross measures of financial globalization have the advantage that they also capture risk-sharing benefits of financial globalization. Then we consider various measures taking into account only foreign liabilities (capturing only the financing side of financial globalization), distinguishing different types of foreign liabilities: foreign direct investment (FDI) and foreign debt (FD), both expressed in percent of GDP and sourced from United Nations Conference on Trade and Development (UNCTAD), 2013.

This paper used government effectiveness (GEF) as an index of institutional quality sourced from World Governance Indicators (WGI), 2013 constructed by Kaufmann *et al.* (2004). The criterion that is used in choosing them is a possible linkage between such index of the quality of a government and the capital flows into a country. Vector of control variables are trade openness (TRO) sourced from UNCTAD, 2013; domestic credit provided by banking sector (DCB), inflation (INF) and interest rate (INT) sourced from WDI, 2013. Real GDP sourced from WDI, 2013 and expressed in log form.

In the estimation of the model, the paper adopts Panel Vector Error Correction Model (PVECM)⁴ framework. A PVECM is a restricted VAR designed for use with non-stationary series that are known to be cointegrated. Following Barro (1990), and Worlu and Emeka (2012), the paper expressed PVECM as thus:

$$\Delta y_{it} = \beta_o + \sum_{i=1}^n \beta_{1i} \Delta y_{i,t-j} + \sum_{i=1}^n \beta_{2i} \Delta k_{i,t-j} + \sum_{i=1}^n \beta_{3i} \Delta iq_{i,t-j} + \sum_{i=1}^n \beta_{4i} \Delta to_{i,t-j} + \sum_{i=1}^n \beta_{5i} \Delta fd_{i,t-j} + \sum_{i=1}^n \beta_{6i} \Delta if_{i,t-j} + \sum_{i=1}^n \beta_{7i} \Delta in_{i,t-j} + \lambda ECT_{t-1} + \varepsilon_{it} \quad (3)$$

$$\Delta k_{it} = \alpha_o + \sum_{i=1}^n \alpha_{1i} \Delta k_{i,t-j} + \sum_{i=1}^n \alpha_{2i} \Delta y_{i,t-j} + \sum_{i=1}^n \alpha_{3i} \Delta iq_{i,t-j} + \sum_{i=1}^n \alpha_{4i} \Delta to_{i,t-j} + \sum_{i=1}^n \alpha_{5i} \Delta fd_{i,t-j} + \sum_{i=1}^n \alpha_{6i} \Delta if_{i,t-j} + \sum_{i=1}^n \alpha_{7i} \Delta in_{i,t-j} + \lambda ECT_{t-1} + \varepsilon_{it} \quad (4)$$

where ECT_{t-1} is the error correction term and ε_{it} is the mutually uncorrelated white noise residual. The coefficient of the ECT variable contains information about whether the past values of variables affect the current values of the variables under study. The size and statistical significance of the coefficient of the error correction term in each ECM model measure the tendencies of each variable to return to the equilibrium. A significant coefficient implies that past equilibrium errors play roles in determining the current outcomes. The short-run dynamics are captured through the individual coefficients of the difference terms. Financial globalization (K) does not Granger cause economic growth (Y) if all $\beta_{2i} = 0$, and economic growth (Y) does not Granger cause financial globalization (K) if all $\alpha_{2i} = 0$. These hypotheses can be tested using standard F -statistics (Mehra, 1994).

Moreover, the preliminary investigation commences with the confirmation of the order of integration of each variable. The study conducts panel unit root tests. There are six popular panel unit root tests with varying assumptions about the autoregressive (AR) process. However, these six tests can conveniently be classified into two main groups based on the assumption of the AR process in the series. The first group assumes that the series have a common root. This group includes the Levin, Lin and Chu test (LLC, 2002), Breitung (2000), and Hadri (2000). The second group assumes that the series have individual root. This group includes Im, Pesaran and Shin (IPS, 1997), Fisher-ADF, and Fisher-PP tests. All the tests in the two groups with the exception of Hadri (2000) take non-stationarity (presence of unit root) as the null. This paper conducted four tests to confirm the reliability of the unit root tests. These tests included LLC, IPS, Fisher-ADF and Fisher-PP.

Also, the second stage of the estimation is to verify whether the variables are cointegrated, after confirming the order of integration of the series. This is done by conducting the panel cointegration tests. This approach becomes much in use because of its inherent advantage of stronger power of the tests when pooling information across all the members of a panel. Three panel cointegration tests were used in this study. These are the Pedroni (1999), Kao (1999) and Johansen tests. The Pedroni and Kao tests are residual-based cointegration tests based on the Engle and Granger (1987) two-step approach and single-equation framework, while the Johansen test is a multivariate test. Thereafter, we estimate Equations 3 and 4 above.

4. Empirical Results and Discussion

Panel unit roots tests (LLC, IPS, Fisher-ADF, and Fisher-PP) are reported in Table 1 for sub-Saharan Africa.

The results in Table 1 suggest that we do not reject the null hypothesis of unit root for most of the variables in levels. However, when the first differences are used, the null hypothesis of unit root (non-stationarity) is strongly rejected at the $p < 0.01$ statistical level. The only exception to this is the GDP , FAL , FD , FDI , INF and INT which are stationary at levels ($p < 0.01$). The study concluded that the variables were stationary at level and first difference.

Table 1: Result of panel unit roots tests

Series	Levin, Lin and Chu*		Im, Pesaran and Shin <i>W</i> -stat		ADF-Fisher chi-square		PP-Fisher chi-square		Order of integration
	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.	
<i>GDP</i>	-7.49*	-13.82*	-10.45*	-22.08*	189.76*	425.3*	338.30*	560.5*	I(0)
<i>FAL</i>	-3.10***	-9.70***	-4.80***	-11.00***	92.90***	228.0**	110.00**	511.0**	I(0)
<i>FD</i>	-2.54*	-11.71*	-5.82*	-19.84*	113.30*	382.4*	254.50*	588.8*	I(0)
<i>FDI</i>	-2.77*	-8.30*	-3.88*	-16.79*	97.04*	323.6*	166.50*	471.8*	I(0)
<i>GEF</i>	3.61	-7.29*	4.87	-17.66*	14.31	331.6*	124.00*	439.1*	I(1)
<i>DCB</i>	-1.57	-8.71*	-0.76	-11.12*	48.57	203.6*	40.04	352.7*	I(1)
<i>TRO</i>	-1.22	-12.02*	-1.40***	-14.17*	50.39	265.0*	66.61*	491.4*	I(1)
<i>INF</i>	-6.13*	-12.25*	-7.31*	-17.16*	137.20*	333.6*	164.70*	497.3*	I(0)
<i>INT</i>	-4.92*	-14.19*	-5.48*	-17.92*	105.10*	334.2*	200.80*	486.1*	I(0)

*, **, *** indicate 10%, 5% and 1% level of significance.

The next stage of the estimation is to verify whether the variables are cointegrated, after confirming the order of integration of the series. This is done by conducting panel cointegration tests. This study considered three panel cointegration tests, namely: Pedroni (1999), Kao (1999) and Johansen tests. The results are presented in Tables 2 and 3.

The critical value for Pedroni tests is -1.64 (Pedroni, 1999, Table 2), with the exception of the v -statistic that has a critical value of 1.64. Thus, any statistical value greater than -1.64 (in absolute terms) implies the rejection of the null hypothesis of no cointegration (Asteriou and Hall, 2007). Both Pedroni and Kao tests are all one-sided with a critical value of 1.64. The results of Pedroni and Kao cointegration tests revealed at least one cointegration. The results of the Johansen-Fisher cointegration showed that the cointegration test confirmed that there was at least four cointegration relationships among the variables in the model in the selected 21 sub-Saharan African countries.

Table 2: Pedroni and Kao panel cointegration tests

Variables in cointegration vector	Test	Intercept	Intercept and trend	None	Kao
<i>GDP, FAL, GEF, DCB, TRO, INF, INT</i>	Panel- v	-3.71**	-4.76***	-3.91***	-1.96**
	Panel- ρ	2.93***	3.81***	2.10**	
	Panel-PP	-1.93**	-2.30**	-0.54	
	Panel-ADF	4.33***	3.76***	4.22***	
	Group- ρ	4.12***	5.06***	2.71**	
	Group-PP	-1.80**	-1.91**	-1.09	
	Group-ADF	4.91***	3.08**	5.08***	
<i>GDP, FD, GEF, DCB, TRO, INF, INT</i>	Panel- v	-3.82**	-4.41***	-3.88***	-1.89**
	Panel- ρ	1.89***	3.47***	2.06**	
	Panel-PP	-1.76**	-2.05**	-0.39	
	Panel-ADF	4.26***	3.32***	4.08***	
	Group- ρ	4.04***	5.53***	2.94**	
	Group-PP	-1.61**	-1.61**	-1.07	
	Group-ADF	4.30***	3.41**	5.11***	
<i>GDP, FDI, GEF, DCB, TRO, INF, INT</i>	Panel- v	-4.14***	-4.54***	-4.31***	-3.41**
	Panel- ρ	1.56	3.63***	2.61**	
	Panel-PP	-2.81**	-1.15	0.06	
	Panel-ADF	3.60***	3.94***	4.31***	
	Group- ρ	3.77***	5.57***	4.23***	
	Group-PP	-0.97	0.91	1.34	
	Group-ADF	3.96***	4.12***	5.51***	

*, **, *** indicate 10%, 5% and 1% level of significance.

Table 3: Johansen-Fisher panel cointegration tests

H ₀ :r	Series											
	<i>GDP FAL GEF DCB INF INT TRO</i>						<i>GDP FDI GEF DCB INF INT TRO</i>					
	λ_{Trace}	$\lambda_{\text{Max-eigen}}$	λ_{Trace}	$\lambda_{\text{Max-eigen}}$	λ_{Trace}	$\lambda_{\text{Max-eigen}}$	λ_{Trace}	$\lambda_{\text{Max-eigen}}$	λ_{Trace}	$\lambda_{\text{Max-eigen}}$	λ_{Trace}	$\lambda_{\text{Max-eigen}}$
$r = 0$	584.90***	397.50***	530.70***	297.00***	505.60***	295.00***						
$r \leq 1$	272.80***	171.90***	299.80***	160.00***	273.30***	139.00***						
$r \leq 2$	131.30***	71.92***	164.30***	84.60***	158.90***	79.50***						
$r \leq 3$	76.42***	55.46**	98.36***	59.43**	98.05***	57.94**						
$r \leq 4$	42.71	30.36	61.87***	40.42	61.11**	39.47						
$r \leq 5$	34.79	28.74	48.19	35.20	47.43	29.66						
$r \leq 6$	49.20*	49.10*	65.94***	65.90***	75.86***	75.80***						

*, **, *** indicate 10%, 5% and 1% level of significance.

It is important to note that the existence of cointegration does not imply causal relationship amongst variables in the model. More specifically, when the model incorporating financial globalization and real output were cointegrated, it did not necessarily mean that changes in the financial globalization had a significant impact on economic growth or that changes in economic growth were due to changes in financial globalization. Perhaps other variables included in the models accounted for the possible long-run nexus that might accomplish such cointegration. In other words, the existence of equilibrium between a group of variables should not be interpreted to mean that equilibrium exists between all pairs of variables in the model. We further examine the long-run relationship amongst the variables through Panel Vector Error Correction Model (PVECM).

Estimates of PVECM as well as diagnostic statistics⁵ for the VEC model are presented in Table 4 and Table 5.

The results in Table 4 reveal that financial globalization (*FAL* and *FDI*) lagged by 1 had a negative and significant impact on economic growth in sub-Saharan Africa. This implies that financial globalization has not improved economic growth in sub-Saharan Africa; it could be as a result of weak institutions in the economies. Moreover, the implication of the findings also confirms that repatriated capital flight retard FDI to enhance economic growth in sub-Saharan Africa. On the other hand, another indicator of financial globalization (foreign debt—lagged by 1 and 2) had a positive and significant impact on economic growth in sub-Saharan Africa. This result implies that high debt flows in sub-Saharan Africa often go along with credit booms and other types of vulnerabilities, which make a country more prone to adverse shocks. FDI as an indicator of financial globalization serves as the robust model⁶ for reliable conclusion and policy direction. This FDI would have more growth impact in sub-Saharan Africa if the governments in the countries put in place policies that will encourage foreign investors to invest gain from financial globalization into the economies. Aside from the short-run analysis the coefficients of the error correction term (ECT) were used to explain the tendencies for the variable to return to equilibrium. The findings reveal that the ECTs have the right sign (i.e. negative) and were significant in all the models. The significant negative sign of the coefficients on ECT indeed supports cointegration between financial globalization and economic growth in the region. The results show that the speed of adjustment from the short run ranged from 44 per cent to 70 per cent for the growth equation. This suggests that the economies can derive the benefits of financial globalization if appropriate macroeconomic policies and strong institutions (that will transform foreign capitals in the countries positively) are put in place.

The paper further shows the direction of causality between financial globalization and economic growth for effective policy-making in the region. The results in Table 4 show that long-run causality runs from economic growth to financial globalization in sub-Saharan Africa.⁷ The implication of this result was that any attempt to develop economic activities of the region call for international capital inflows from capital-rich countries into the economies. Other indicators of financial globalization (FDI and foreign debt) show the evidence of bi-direction causality between financial globalization and economic growth in the economies.

In the growth equation,⁸ the results further show that institutional quality (government effectiveness) lagged by 2 had a negative and significant impact on economic growth in sub-Saharan Africa. This suggests that the economies are characterized by government ineffectiveness, which in turn is responsible for low economic growth. The results also reveal that interest rate lagged 1 and 2 had a negative and significant effect on economic growth in sub-Saharan Africa. This implies that interest rate encourages domestic investors which in turn improves economic growth in sub-Saharan Africa. Also, trade openness lagged by 1 had a positive and significant impact on economic growth in sub-Saharan Africa. This implies that trade openness encourages economic advancement in the countries.

Table 4: Panel vector error correction model results

Growth equation		Fin. globalization equation	
Variable	Estimate	Variable	Estimate
Sum of foreign assets and liabilities in per cent of GDP			
Δgdp_{t-1}	-0.151*** [-2.971]	Δfal_{t-1}	-0.157** [-1.993]
Δfal_{t-1}	-0.053* [-1.772]	Δgef_{t-1}	-1.673** [-2.268]
Δgef_{t-2}	-1.678** [-2.010]		
Δint_{t-1}	-0.088*** [-4.26]		
Δint_{t-2}	-0.043** [-2.121]		
Δtro_{t-1}	0.112*** [2.739]		
ΔECT_{t-1}	-0.681*** [-5.931]	ΔECT_{t-1}	-0.531* [-1.724]
Adj. R^2	0.422	Adj. R^2	0.210
Direction of Causality: y fal		Direction of Causality: fal y	
Multivariate VEC Granger Causality		Multivariate VEC Granger Causality	
χ^2	41.49***	χ^2	10.35
Foreign Direct Investment			
Δgdp_{t-1}	-0.133*** [-2.596]	Δfdi_{t-1}	-0.198*** [-4.560]
Δfdi_{t-1}	-0.134** [-2.482]	Δdcb_{t-1}	-0.042*** [-2.625]
Δgef_{t-2}	-1.535* [-1.840]	Δgef_{t-1}	1.426** [1.990]
Δint_{t-1}	-0.081*** [-4.033]	Δgef_{t-2}	1.191* [1.707]
Δint_{t-2}	-0.042** [-2.149]	Δinf_{t-2}	-0.046*** [-3.692]
Δtro_{t-1}	0.087** [2.293]		
ΔECT_{t-1}	0.707*** [-4.423]	ΔECT_{t-1}	-0.147* [-1.695]
Adj. R^2	0.435	Adj. R^2	0.179
Direction of Causality: y fdi		Direction of Causality: fdi y	
Multivariate VEC Granger Causality		Multivariate VEC Granger Causality	
χ^2	45.23***	χ^2	28.44***
Foreign Debt			
Δgdp_{t-1}	-0.328*** [-3.060]	Δfd_{t-1}	-0.281*** [-7.071]
Δfd_{t-1}	1.721*** [3.554]	Δgdp_{t-1}	0.002*** [5.099]
Δfd_{t-2}	1.211** [2.240]	Δgdp_{t-2}	0.001*** [2.792]
Δgef_{t-2}	-1.407* [-1.682]	Δinf_{t-1}	-0.024* [-1.680]
Δint_{t-1}	-0.068*** [-3.288]		
Δtro_{t-1}	0.117*** [2.953]		
ΔECT_{t-1}	-0.444*** [-9.550]	ΔECT_{t-1}	-0.170*** [-6.769]
Adj. R^2	0.377	Adj. R^2	0.188
Direction of Causality: y fd		Direction of Causality: fd y	
Multivariate VEC Granger Causality		Multivariate VEC Granger Causality	
χ^2	46.47***	χ^2	30.49***

*, **, *** indicate 10%, 5% and 1% level of significance. Figures in parentheses are t -statistics.

In financial globalization equation, government effectiveness lagged by 1 and 2 had a negative and significant effect on financial globalization in sub-Saharan Africa. This result suggests that the economies are characterized by government ineffectiveness and this did not allow the region to reap the full benefits of financial globalization. Also, financial development lagged by 1 had a negative effect on FDI in the countries. This indicates that financial sectors in the economies are not well developed to attract more capital inflows to the region. The results further show that inflation lagged by 2 had a negative impact

Table 5: Diagnostic tests results

Test	Estimates	Prob.
Ramsey Specification Test	19.292	0.17
Normality Test	5394.21	0.15
Heteroskedasticity Test	6741.53	0.12
Lagrange Multiplier Test (LM ₂)	74.164	0.19

Table 6: Model specification diagnostic check

	Model 1 FAL	Model 2 FDI	Model 3 Foreign Debt
Akaike AIC	6.006	5.983	6.081
Schwarz SC	6.126	6.103	6.201
F-stat	29.36	30.88	24.53
Adj. R ²	0.422	0.435	0.378

on FDI in sub-Saharan Africa. This implies that an increase in inflation hampers aggregate demand in the countries which in turn discourage foreign investors. Moreover, inflation lagged by 1 had a negative impact on foreign debt in the countries. This suggests that a decrease in inflation calls for more sources of foreign debt in order to develop economic activities of the region. The results further reveal that economic growth lagged by 1 and 2 had a positive impact on foreign debt in the countries. This indicates that foreign debt aids economic growth in sub-Saharan Africa.

5. Conclusion/Recommendation

This paper investigates the long-run relationship between financial globalization and economic growth in sub-Saharan Africa using panel cointegration tests and Panel Vector Error Correction Model (PVECM).

The results showed that all the variables are cointegrated, that is, they are related in the long run. The results of the ECT test within the framework of PVECM affirmed the cointegration tests. The results of the direction of causality revealed evidence of unidirectional causality and bi-directional causality between financial globalization and economic growth in sub-Saharan Africa. The paper concluded that there is a long-run relationship between financial globalization and economic growth in sub-Saharan Africa. One of the implications of these results was that the economies will benefit from the era of financial globalization in the long run in as much as the governments promote and encourage sound macroeconomic policies and strong institutions. Therefore, the governments in sub-Saharan Africa should adopt policies that will prevent them from adverse shock⁹ of financial globalization and assist the economies to tap the benefits of international capital flows. Secondly, in the model where Granger causality runs from economic growth to financial globalization, the governments of the countries have to intensify efforts on policies that will enhance growth which will in turn improve financial globalization of the economies. Moreover, in the model where evidence of bi-directional causality between financial globalization and economic growth was found, policies designed to enhance efficiency of the financial globalization and economic growth would be mutually beneficial. Such policies could entail consolidation and improvement on current growth and investment patterns in these economies to improve attraction of international financial inflows which in turn will engender economic growth.

Notes

1. For extensive literature see Akin and Kose (2008) and Kose *et al.* (2009b).
2. A country with minimum threshold and composition hypotheses benefits from financial globalization (Wei, 2006).
3. The 21 countries included in the study were randomly selected from the list of countries in SSA.

4. The VECM has cointegration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The cointegration term is known as the *error correction* term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.
5. The normality test denotes the Jarque-Bera normality test of errors. The Lagrange Multiplier test (LM) tests the null hypothesis that there is no second order autocorrelation. The Ramsey test tests the null hypothesis that there is no functional form misspecification.
6. This is determined through the lowest value in the AIC and SC (see Table 6); and also the model shows the highest value of F -stat. In addition, the adjusted R^2 shows the highest value which indicate that FDI as an indicator of financial globalization explained the model most.
7. The evidence of unidirectional causality only showed from the main indicator of financial globalization, i.e. *FAL*.
8. The estimated models for the countries in this study show that the results in the growth equation are better than the financial globalization equation considering all the variables used in the paper.
9. That is, during the reversal of capital flows from the capital rich economies.

References

- Akin, C. and M. A. Kose (2008), 'Changing Nature of North-South Linkages: Stylized Facts and Explanations', *Journal of Asian Economics*, Vol. 19, No. 1, pp. 1–28.
- Alfaro, L., A. Chanda, S. Kalemli-Ozcan and S. Sayek (2004), 'FDI and Economic Growth: The Role of Local Financial Markets', *Journal of International Economics*, Vol. 64 (October), pp. 89–112.
- Anyanwu, J. C. (2014), 'Factors Affecting Economic Growth in Africa: Are There any Lessons from China?', *African Development Review*, Vol. 26, No. 3, pp. 468–93.
- Aryeetey, E. and C. Ackah (2011), 'The Global Financial Crisis and African Economies: Impact and Transmission Channels', *African Development Review, Special Issue: Rethinking African Economic Policy in Light of the Global Economic and Financial Crisis*, Vol. 23, No. 4, pp. 407–20.
- Asteriou, D. and S. Hall (2007), *Applied Econometrics: A Modern Approach*, rev. edn, Palgrave Macmillan, New York.
- Barro, R. J. (1990), 'Government Spending in a Simple Model of Endogenous Growth', *Journal of Political Economy*, Vol. 98, pp. 103–25.
- Bartolini, L. and A. Drazen (1997), 'Capital-account Liberalization as a Signal', *American Economic Review*, Vol. 87, No. 1, pp. 138–54.
- Breitung, J. (2000), 'The Local Power of some Unit Root Tests for Panel Data', in B. H. Baltagi, T. B. Fomby and R. Carter Hill (eds.), *Nonstationary Panels, Panel Cointegration and Dynamic Panels, Advances in Econometrics*, Vol. 15, pp. 161–78, Emerald Group, Bingley.
- Christopoulos, D. K. and E. G. Tsionas (2004), 'Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests', *Journal of Development Economics*, Vol. 73, pp. 55–74.
- Eichengreen, B. J. (2001), 'Capital Account Liberalization: What Do Cross-Country Studies Tell Us?' *World Bank Economic Review*, Vol. 15, pp. 341–65.
- Eichengreen, B., R. Gullapalli and U. Panizza (2009), 'Capital Account Liberalization, Financial Development and Industry Growth: A Synthetic View', Working Paper No. 144.
- Engle, R. F. and C. W. J. Granger (1987), 'Co-integration and Error Correction: Representation, Estimation and Testing', *Econometrica*, Vol. 55, pp. 251–76.

- Eregha, P. B. (2012), 'The Dynamic Linkages between Foreign Direct Investment and Domestic Investment in ECOWAS Countries: A Panel Cointegration Analysis', *African Development Review*, Vol. 24, No. 3, pp. 208–20.
- Friedrich, C., I. Schnabel and J. Zettelmeyer (2010), 'Financial Integration and Growth: Is Emerging Europe Different?' European Bank for Reconstruction and Development (EBRD), Working Paper No. 123.
- Gourinchas, P. O. and O. Jeanne (2005), 'Capital Mobility and Reform', IMF manuscript, Washington DC.
- Hadri, K. (2000), 'Testing for Stationarity in Heterogeneous Panel Data', *Econometric Journal*, Vol. 3, pp. 148–61.
- Im, K., H. Pesaran and Y. Shin (1997), 'Testing for Unit Roots in Heterogeneous Panels', DAE Working Paper No. 9526, University of Cambridge.
- Inekwe, J. N. (2013), 'FDI, Employment and Economic Growth in Nigeria', *African Development Review*, Vol. 25, No. 4, pp. 421–33.
- International Monetary Fund (2011), *World Economic and Financial Surveys, Regional Economic Outlook Sub-Saharan Africa Recovery and New Risks*, International Monetary Fund.
- Kao, C. (1999), 'Spurious Regression and Residual-Based tests for Cointegration in Panel Data', *Journal of Econometrics*, Vol. 90, pp. 1–44.
- Kaufmann, D., A. Kraay and M. Mastruzzi (2004), 'Governance Matters: Governance Indicators for 1996–2002', The World Bank, Washington DC.
- Klein, M. (2005), 'Capital Account Liberalization, Institutional Quality and Economic Growth: Theory and Evidence', NBER Working Papers 11112, Cambridge, MA.
- Kose, M. A., E. S. Prasad, K. Rogoff and S. J. Wei (2006), 'Financial Globalization: A Reappraisal', IMF Working Paper 06/189, Washington DC.
- Kose, M. A., E. S. Prasad, K. Rogoff and S. J. Wei (2009a), 'Financial Globalization: A Re-appraisal', *IMF Staff Papers*, Vol. 56, No. 1, pp. 8–62.
- Kose, M. A., E. S. Prasad, K. Rogoff and S. J. Wei (2009b), 'Financial Globalization and Economic Policies', Global Economy and Development Working Paper 34.
- Kose, M. A., E. S. Prasad, M. E. Terrones (2004), 'Volatility and Comovement in an Integrated World Economy: An Exploration', in H. Siebert (ed.), *Macroeconomic Policies in the World Economy*, Springer-Verlag, Berlin.
- Kunieda, T., K. Okada and A. Shibata (2011), 'Corruption, Globalization, and Economic Growth: Theory and Evidence', Munich Personal RePEc Archive, Paper No. 35355, available at: <http://mpa.ub.unimuenchen.de/35355/>
- Levin, A., C. Lin and C. Chu (2002), 'Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties', *Journal of Econometrics*, Vol. 108, pp. 1–24.
- Luca, O. and N. Spatafora (2012), 'Capital Inflows, Financial Development, and Domestic Investment: Determinants and Inter-Relationships', IMF Working Paper, WP/12/120.
- Mehra, P. Y. (1994), 'Wage Growth and the Inflation Process: An Empirical Approach', in B. B. Rao (ed.), *Cointegration for the Applied Economist*, pp. 147–59, St Martin's Press, New York.
- Mishkin, F. S. (2006), *The Next Great Globalization: How Disadvantaged Nations Can Harness Their Financial Systems to Get Rich*, Princeton University Press, Princeton, NJ.
- Nsiah, C. and C. Wu (2014), 'The Role of Spatial Dynamics in the Determination of Foreign Direct Investment Inflows to Africa', *African Development Review*, Vol. 26, No. 3, pp. 494–507.
- Pedroni, P. (1999), 'Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors', *Oxford Bulletin of Economics and Statistics*, Special Issue, No. 61, pp. 653–70.
- Prasad, E. S., K. Rogoff, S. J. Wei and M. A. Kose (2007), 'Financial Globalization, Growth and Volatility in Developing Countries', University of Chicago Press, available at: <http://www.nber.org/chapters/c0114>.

- Quinn, D. P. and A. M. Toyoda (2008), 'Does Capital Account Liberalization Lead to Growth?' *Review of Financial Studies*, Vol. 21, No. 3, pp. 1403–49.
- Schularick, M. and T. M. Steger (2006), 'Does Financial Integration Spur Economic Growth? New Evidence from the First Era of Financial Globalization', Institute of Economic Research (WIF), Economic Working Paper series.
- Stulz, R. (2005), 'The Limits of Financial Globalization', *Journal of Finance*, Vol. 60, No. 4, pp. 1595–637.
- Svrtinov, G. V., N. Krume and P. Vlatko (2013), 'Positive and Negative Effects of Financial Globalization on Developing and Emerging Economies', International Scientific Conference 'Regional Economic Cooperation in the Process of Globalization', pp. 127–28.
- Tchereni, B. H. M., T. J. Sekhampu and R. F. Ndovi (2013), 'The Impact of Foreign Debt on Economic Growth in Malawi', *African Development Review*, Vol. 25, No. 1, pp. 85–90.
- Tumwebaze, H. K. and A.T. Ijjo (2015), 'Regional Economic Integration and Economic Growth in the COMESA Region', *African Development Review*, Vol. 27, No. 1, pp. 67–77.
- Wei, S. J. (2006), 'Connecting Two Views on Financial Globalization: Can We Make Further Progress?' *Journal of the Japanese and International Economies*, Vol. 20, No. 4, pp. 459–81.
- Worlu, C. N. and N. Emeka (2012), 'Tax Revenue and Economic Development in Nigeria: A Macroeconometric Approach', *Academic Journal of Interdisciplinary Studies*, Vol. 1, No. 2, pp. 211–23.