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Inclusive Growth Effect of Financial Integration in Africa

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Abstract: The link between financial integration and real GDP has been the major focus of this study. The study employs both Johansen Cointegration and Generalized Method of Moments (GMM) approaches to examine this nexus in Africa. The finding indicates that financial integration significantly and negatively influences real GDP of the African economy. However, the influence of foreign assets on Africa's real GDP is statistically significant and positive.
Keywords: Financial integration, Johansen cointegration, generalized method of moments.

MOTIVATION AND INTRODUCTION

Financial integration brings numerous advantages as identified in the existing studies. These advantages include improvement in the cross-border capital mobility, investment and financial information [3]; enhancing the financial systems and financial transactions; facilitating the efficient capital allocation, and regional capital accumulation; and improving the productivity [29, 2]. In addition, the financial integration ensures the free capital movement which leads to the long-run growth of the real economy. Therefore, this creates a room for linking financial integration with growth models.

Based on the Solow-Growth Model, capital accumulation boosts the economic growth as well as overall real economy. Regional capital accumulation improves the regional investment and productivity. The previous studies have not empirically explored the nexus in the context of Africa. In the light of the above, this study investigates the relationship between financial integration and the real economy in the African region.

Despite the link between financial integration and economic growth, existing studies differ in terms of growth-effect of financial integration. Better access to finance by the domestic firms and individual households can be attained through capital inflows resulting from financial integration. Financial integration has been considered as a means of accelerating domestic financial market depth. Therefore, it can be reasonably assumed that financial integration improves access to finance.

However, Zaman, Izhar, Khan, and Ahmad [30], postulated that inflows of capital might not improve the welfare of the poor. Volz found that financial development did not enhance financing conditions for domestic private sector in the European market. Bekaert, Harvey, and Lundblad [5] found that financial integration led to lower cost of equity capital and more investment because risks are shared across markets. Some studies pointed out that absence of access to finance by both households and firms especially in emerging markets adversely influences economic growth and poverty reduction [21]. According to the World Bank [28], the availability of financial products when they are needed by the users, is critical to financial access. Inconclusive arguments create a room for this study to explore the nexus in the context of African economy. In addition, with the ongoing government measures to attract foreign assets, this calls for the investigation on how capital inflows affect the welfare of the people.

Thus, this study intends to fill this existing gap by empirically testing the hypothesis about the relevance of financial integration in Africa. Africa is considered as the key interest because of its dynamic economic and resource nature of the continent. The study provides empirical evidence that will guide policy design and implementations in order to enhance operations of future financial markets across the continent. It employs the gross stock of foreign assets and liabilities as a measure of financial integration in line with International Monetary Fund (IMF), [11]. In addition, this study utilizes panel vector error correction model to analyze the effects of financial integration on long-term African growth.

The rest of the study is organized into four sections. Section Two provides a brief literature review on financial integration and economic growth. Methodology is described in Section Three while Section Four presents and discusses empirical findings. Concluding remark is Section Five.

BRIEF LITERATURE REVIEW

Financial integration can result into the overcrowded banking sector and unfair competition between foreign and local businesses in the presence of weak regulatory framework, and thus it constrains access to finance by the locals [1, 9] 26]. Schmukler &Vesperoni [26] pointed out that global-connected firms possess greater opportunities to financial access relative to firms that only rely on local sources of financing. Building a sound institutional framework is the responsibility of the government while financial system is saddled with providing access to finance. Access to finance varies significantly between advanced and developing countries. In developing countries, absence of access to finance is severe and is tantamount to lack of access to basic needs like water, shelter, health, education and other infrastructure. With a well-functioned financial system, savings, investment and innovation are incentivized by reducing the costs of transactions and information in implementing its tasks [21].

In addition, the failure of banking sector in executing its role of intermediation leads to very hike interest rate spreads which make credit costly and poor remuneration for deposits, hinder access to finance [9]. Furthermore, Dahou *et al.* [9] showed that underdeveloped nature of capital markets in Africa restrains the access to long-term financing and constrains the region's ability for domestic debt financing. The absence of innovative financial instruments in the area of small and medium enterprises (account for a majority of businesses in Africa), prevents the potential benefits of financial integration in the region. These enterprises remain informal sector because of insufficient financial services [9]. Zaman *et al.* [30], revealed that inflows of capital might not improve the welfare of the poor. Bekaert, Harvey, and Lundblad [5] found that financial integration led to lower cost of equity capital and more investment because risks are shared across markets. Some studies pointed out that absence of access to finance by both households and firms especially in emerging markets adversely influences economic growth and poverty reduction [21].

METHODOLOGY

The linear equation is widely explored to investigate a long-term connection in two or more variables. The main focus of this study is to analyze the causal relationship between financial integration and economic growth in Africa. Identifying the causal directions and response effects between the concerned variables help policymakers make informed policy decisions in relation to sustainable economic growth [27].

Data and variables

Data series used for this study are obtained from World Bank's World Development Indicator (WDI) and PennWorld Table. The nexus between financial integration and inclusive growth is explored for which the gross stock of foreign assets and liabilities has been utilized as a proxy of financial integration. Inclusive growth is represented by real Gross Domestic Products (GDP). Both proxies are collected from the World Bank and the PennWorld Table. The dataset covers the period from 2005 to 2015 for the sample of 25 African countries. The study employs the Generalized Method of Moments (GMM) technique that requires the number of cross-sectional entities (N) to be more than sample period (T). The descriptive statistics as well as the correlation matrix are presented in the appendix (see Table A.1 and Table A.2).

Estimated models

The study utilizes Cointegration test proposed by Johansen and Juselius to investigate the financial integration. This method is appropriate where the concerned variables are not covariance stationary in the level but they are stationary in the first differences. Several steps are involved in examining the presence of cointegration among the variables. First, the order of the integration of each series in the model has to be tested. In this study, the stationary of each series is carried out using the Augmented Dickey and Fuller [10] and the Phillip-Perron (PP) unit root test as follows:

$$\Delta Y_t = \propto_0 + \propto_{1t} + \gamma Y_{t-1} + \sum_{i=1}^{p} \beta_i Y_{t-i} + \varepsilon_t \quad (1)$$

$$\Delta Y_t = \propto_0 + \propto_{1t} + \gamma Y_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where, the?? Denotes the gross stock of foreign assets and liabilities, or real GDP,$\propto_0$ represent constant terms, t is the time period, $\propto_{1t}$ represents the intercept and time trend, Δ denotes the first difference operator, ε_t denotes the white noise residual, and p is the number of lagged values. Second, the optimal lag length for the specified model is chosen in line with a sequential log likelihood ratio (LR) test as in Lutkepohl [17]. Third, selecting the appropriate model about the deterministic components in the multivariate system is based on the information criteria. A typical VAR (k) model is specified as follows:

$$\Delta X_t = \Pi X_{t-1} + \sum_{t=1}^{k} \tau_i \Delta X_{t-i} + \varepsilon_{kt} \ldots\ldots\ldots (3)$$

Where, $X_t(X_{1t}, X_{2t}, \ldots\ldots)$ is an nx1 vector of I(1) country financial integration and real GDP. ΔX_t are first difference of all indices I(0), τ_i denotes n x n

coefficient matrices, Π is a long-run coefficient matrix, k is the number of lagged values and ε_{kt} represents the error terms. Fourth, the rank of Π or the number of cointegrating vectors is determined. Both Johansen and Juselius [12] and Johansen [13] proposed two likelihood ratio (LR) statistics which are trace statistic (λ_{trace}) and the maximum eigenvalue (λ_{max}) test for investigating the rank of matrix Π_i or the number of cointegration(s) based on the below equations:

$\lambda_{trace} = -T\sum_{i=r+1}^{n}\ln(1-\hat{\lambda}_{r+1})$……(4)

$\lambda_{max} = -T\ln(1-\hat{\lambda}_{r+1})$ … … … … … … … … … … … (5)

Where, T is the sample size, and $\hat{\lambda}_r$ represents the largest eigenvalue of the Π_i matrix obtained from the Eq. (3). The null hypothesis of trace test is that the number of cointegrating vectors is less than or equal to r, while the alternative hypothesis is that r matrix is of the full rank(r=n) cointegrating vectors. On the other hand, the null hypothesis in the max-eigenvalue test is, r =1, and the alternative hypothesis is that the rank is more than one(r > 1). Once the cointegration link is confirmed, this study then explores whether the financial integration affects the real GDP in Africa.

The study utilizes the system General Methods of Moment (GMM) developed Blundell and Bond [6] and Blundell *et al* [7] to examine the impacts of financial integration on the real GDP. This approach is the most appropriate for the small samples of this study. The specified GMM model can be specified as follows:

$y_{i,t} = \lambda y_{i,t-1} + \beta x_{i,t-1} + \varepsilon_{i,t} |\lambda < 1|$ …… (6)

Where, $\varepsilon_{i,t} = \eta_i + v_{i,t}$ ……(7)

Here, $y_{i,t}$ denotes real GDP as a dependent variable, $y_{i,t-1}$ represents the lagged value of real GDP, and$x_{i,t}$ indicates the financial integration variable. The financial integration is captured by the proxy variable: gross stock of foreign assets and liabilities, i and t represent the indicators and time respectively. The GMM approach is employed because it addresses the problems of causality inverse, biases and omitted variables [16].

Hypothesis development

Hypothesis developed in respect to the objectives of this study is as follows:

H1: Financial integration affects real GDP positively

H2: Components ofFinancial integration affects real GDP positively

There is a theoretical expectation that financial integration improves economic growth because an increase in foreign capital inflows indirectly boosts the production sector. The expansion of the production sector enhances the GDP growth. This hypothesis is line with the suggestion of Leila (2011 [18]).

EMPIRICAL RESULTS AND DISCUSSIONS

To test the hypothesis, the results are reported in two forms: first, examining the financial integration and real GDP by Johansen cointegration test and second, investigating the effect of financial integration on real GDP estimated by GMM technique.

The condition for Johansen cointegration test is that all data series has to be I(1) which is tested by using stationarity test. This study employs both ADF and PP test to examine the stationarity of the concerned series. The null hypothesis of unit root problem is not rejected at the level form but is rejected at the first difference (See Table 1). This shows that the data series are I (1), which allows the use of the Johansen Cointegration test.

Table 1: Result of Unit Root Tests (No intercept & No trend)

Series	Levin, Lin & Chu t*	ADF - Fisher Chi-square	PP - Fisher Chi-square
D(LNASST)	-13.31***	189.95***	332.10***
D(LNLIAB)	-11.38***	160.24***	226.31***
D(LNRGDP)	-4.52***	67.73***	98.65***

Note: ***, **, and * represents 1%, 5% and 10%

Intercept

Series	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
D(LNASST)	-3.06***	-6.91***	114.00***	332.80***
D(LNLIAB)	2.77	-3.99***	93.39***	583.03***
D(LNRGDP)	-6.27***	-5.87***	96.52***	148.78***

Note: ***, **, and * represents 1%, 5% and 10%

Intercept & Trend

Series	Levin, Lin & Chu t*	ADF - Fisher Chi-square	PP - Fisher Chi-square
D(LNASST)	-3.10***	90.35***	481.63***
D(LNLIAB)	-0.50	63.60***	382.70***
D(LNRGDP)	-6.28***	84.29***	148.63***

Note: ***, **, and * represents 1%, 5% and 10%

The estimated result in Table 2 shows that the null hypothesis of λ_{max} and λ_{trace} can be rejected, meaning cointegrating vector is established in the system. This implies that the financial integration maintains cointegration relationship with real GDP in Africa. In the same vein, disaggregated financial integration has a long-run connection with the region's real GDP (See Table 3). This finding is supported by that of Yuhn, [29]; Bai and Zhang, [2].

Table 2: Cointegration Test for LNRGDP and LNFIN

Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	80.38	0.00	68.42	0.00
At most 1	53.17	0.01	53.17	0.01

Table 3: Cointegration Test for LNRGDP and LNFIN's components

Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	31.94	0.00	33.39	0.00
At most 1	33.66	0.00	30.69	0.00
At most 2	15.46	0.22	15.46	0.22

Financial integration and real GDP

The result in Table 5 depicts the connection between financial integration and real GDP. It also reveals whether the financial integration affects the real GDP. The estimated coefficient of financial integration is significant and negative in explaining real GDP. This suggests that real GDP responds to the change of financial integration in an inverse manner. However, gross stock of foreign assets (LNASST) positively and significantly determine the real GDP in Africa; whereas negative effect of foreign liabilities (LNLLAB) is recorded (see Table 6).This finding is consistent with that of Sarkar and Amor (2011) who found an insignificant relationship between financial integration and GDP growth. However, the negative connection between financial integration and real GDP can be attributed to the capital outflows.

Table 5: GMM Dynamic Panel Estimates (Dependent variable LNRGDP)

Independent Variable	Coefficient
LNRGDP(-1)	1.0166***
LNFIN	-0.0049***

Note: ***, **, and * represents 1%, 5% and 10%

Table 6: GMM Dynamic Panel Estimates (Dependent variable LNRGDP)

Independent Variable	Coefficient
LNRGDP(-1)	1.0166***
LNASST	0.0021***
LNLIAB	-0.0004

Note: ***, **, and * represents 1%, 5% and 10%

On the other hand, financial integration enhances the GDP growth through improving the financial systems and market transparency which encourages foreign investment [4]. This is also complied with that of Rahman *et al.* [24] who found a positive link between financial integration and economic growth.

The empirical outcome of this study poses interesting results. There is existence of close relationship between the financial integration and the real GDP. Similar results can be observed in the study of Leila [18] and Mmolainyane and Ahmed [20] that indicated the significant link between financial integration and the real GDP. This nexus is explained

by Solow-Growth Model that postulates that capital accumulation enhances the economic growth [14, 15]. With financial integration, free capital mobility is secured and thus improves the income level that would lead to the long-run growth of the real economy.

CONCLUDING REMARKS

This study employs Johansen cointegration test and GMM econometric approach to examine the nexus between financial integration and real GDP in Africa. Johansen cointegration test is employed for examining the long-run relationship between financial integration and real GDP while GMM method is used to investigate whether financial integration affects real GDP. The study reveals the following: Real GP is found to be statistically influenced by financial integration. In addition, the study offers productive policy implications for the African economy. Since a solid relationship is maintained between financial integration and real GDP, it is strongly recommended that policymakers need to develop the financial integration further in order to boost the real economy, through removing barriers on capital mobility; integrating low-income countries through provision of technical and physical supports; and strengthen the fund to develop the market integration. In addition, any government measure that can be exerted to stimulate a rise in foreign assets but curbing foreign liabilities in the region needs to be given more attentions.

APPENDIX

Table A.1: Descriptive Statistics

Statistics	ASST	LIAB	RGDP
Mean	1358.95	1141.16	5.00E+10
Median	144.63	77.60	1.00E+10
Maximum	38526.50	45273.23	4.50E+11
Minimum	-12744.44	-16542.62	3.22E+08
Std. Dev.	3789.22	4937.20	9.37E+10
Skewness	4.56	3.96	2.38
Kurtosis	33.85	26.95	7.88
Jarque-Bera	18326.51	11270.15	821.91
Probability	0.00	0.00	0.00
Sum	577552.50	484992.60	2.13E+13
Observations	425	425	425

Table A.2: Correlation matrix

	ASST	LIAB	RGDP
ASST	1.00	0.53	0.63
LIAB	0.53	1	0.57
RGDP	0.63	0.57	1

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