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An assessment of the impact of the banking sector on the economic growth of sub-Saharan African countries in the post financial crises

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Abstract

This study investigated the influence of banking sector on economic growth in sub-Saharan Africa (SSA) during the post financial crises of 2007/2008. In the last one and the half decades, most SSA countries have made remarkable strides in terms of the development of their banking sectors as well as enacting policies that will boost Africa's economic growth as documented in various reports of the World Bank and International Monetary Fund (IMF. Despite all these positive scores and developments made by the banking sectors in Africa, growth has been hampered in the last one and the half decades. Moreover, most African countries witnessed unsteady and hampered growth in their economies during the period after the crises despite the adjudged weak linkages of banking sectors across Africa to the sub-prime mortgage market and asset-backed securities, and limited exposure to complex financial instruments among others. Thus, we utilized the Pooled Mean Group Autoregressive Distributed Lag (PMG/ARDL) estimation technique to analyze the secondary data spanning from 2009 to 2020. The empirical result revealed, among others, that the level of development of the banking sectors in the region influenced economic growth in the region during the aforesaid period. Furthermore, any short run deviation or shock is normally corrected in the long run at the speed of 82.85%. Curiously, this study revealed that financial deepening and the degree of monetization in the economies are the main drivers of short and long run growth in the post crises period. Thus, this study recommended that policy makers in the region should pay great attention to deepening their economies as this study has shown that it is the main driver of growth in the post financial crises economies of sub Saharan Africa.

Keywords: Banking Sector Development; Economic Growth; PMG/ARDL; Sub-Saharan Africa

1. Introduction

Ever since [1] documented the role of financial variables in the growth process more than a century ago, the field of the finance-growth nexus debate has witnessed an undulation of different channels through which financial variables affect economic growth. [1] asserted that the services provided by financial intermediaries such as savings mobilization, risk management, project evaluation, monitoring managers and facilitating transaction are crucial for the technological innovation and economic development of a nation. Thus, the financial sector is at the centerpiece of this finance-growth framework.

The banking sub-sector of the financial sector acts as a significant sector of the financial sector of nations where it plays the crucial role of propelling the engine of economic growth and development. A developed banking sector has been seen as a pioneer of economic growth via its function of mobilization of savings, granting of credit and risk management. Consequent upon this, the rate of the development of the banking sector is measured by its ability to deliver these roles efficiently [2].

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After the global financial crises of 2007-2008 that resulted in economic slowdown in the economies of sub-Saharan African countries, no concerted effort has been made to empirically ascertain the influence of banking sector development on economic growth in sub-Saharan Africa in the period after the global financial crises. Sub-Saharan Africa governments made significant progress in promoting growth with economic stability in the decade prior to the financial crises. Real GDP growth averaged 5.14 percent over the period of 1999 to 2008; inflation had dropped to single digit levels prior to the fuel and food prices shock of 2008 and reserves were piled up [3]. These positive strides were as a result of effective economic policies, a favorable external environment, debt relief and foreign aid. However, these hard-won economic progresses were threatened at the onset of the crises. For instance, GDP growth rate fell to 3.04 percent in 2009, the lowest in the 9 preceding years while GDP growth rate averaged 3.56 percent and 2.2 percent over the period of 2009 to 2018 and 2015 to 2018 respectively. Obviously, African countries were not totally protected from the global economic meltdown despite the somewhat weak financial linkages with developed economies. Demand for African exports fell in the years after the crises, commodity prices fell and workers' remittance flows declined. The stiff global credit conditions decreased foreign direct investment and reversed portfolio flows, thus, making trade finance very costly. The economic slowdown also increased credit risk and deteriorated the balance sheets of financial institutions and corporations.

The Banking sector is largely seen as the main route through which the direct effect of the financial crisis would be transmitted through the cross-border activities between banks. However, in the sub-Saharan African economies, financial institutions were relatively resilient as a result of their limited exposure to the sub-prime mortgage market and asset-backed securities, and limited exposure to complex financial instruments [4]. This resulted in fewer exposures and risks of potential losses. In addition to that, the existence of capital control in some countries, such as Nigeria and Ghana, helped in reducing the direct and indirect impacts of the crisis on the banking systems [3]. Notably, despite the limited effect of the crises on the banking sector in sub-Saharan African region, banks' flow of credit to the private sector fell in most countries [5]. For instance, starting from the last month of 2008, enterprise in Ghana started witnessing incessant tightening of credit conditions while credit to household for property purchase also deteriorated considerably in the last quarter of 2008 [6]. In Kenya, on the other hand, the growth of the banks' flow of credit to the private sector fell from 7.4 percent in the third quarter of 2008 to 2.5 percent in the last quarter of 2008 [7]. The fall in credit flow to the private sector seems to be peculiar to several other African countries. Due to the credit tightening, several Small and Medium Scale Enterprises (SMEs) and household were affected drastically [6].

Curiously, given the unstable and hampered economic growth in the region after the financial crises and credit tightening by banks despite the adjudged low exposure of the banking sector to the financial crises, it is imperative to access the nexus between banking sector development and economic growth in sub-Saharan Africa in the post-crises era.

2. Literature review

In this section, some recent similar studies will be reviewed and the research gap established.

[8] examined the effect of banking sector development on economic growth in a panel of 33 sub-Saharan African countries for the period 1995 to 2015. Differenced Generalized Methods of Moments (GMM) was used to estimate the model. The result of the study showed that banking sector development negatively and significantly affects economic growth in the short run. While Gross Fixed Capital formation and trade openness as ratios of GDP significantly have positive effect on economic growth, foreign direct investment and labor force participation rate have no significant effect on economic growth.

[9] used the fixed effect, random effects and maximum likelihood panel data estimation method to investigate the relationship between banking sector development, human capital and economic growth on eight sub-Saharan African countries for the period 1970-2000. The empirical results revealed that financial development have no robust effect on economic growth which is attributable to the long period of financial repression in the area, while the stock of human capital and physical capital are crucial for growth in the area. Nonetheless, the two studies failed to capture the means through which financial development may affect economic growth. This might have given a different result all together.

[10] investigated the relationship between financial development and economic growth in twenty-four Sub-Saharan African countries over the period 1975 to 2005 using panel co-integration and panel Generalized Method of Moments (GMM) causality estimation techniques. Three banking sector development indicators were used, which includes-private sector credit/GDP ratio, liquid liability ratio of banks and total assets of deposit money banks/GDP ratio (size of the banking sector/GDP). Panel co-integration did not reveal any long-run relationship between financial development and economic growth, while a short-run causality results varies depending on the financial development indicator

employed. For instance, there is a bi-directional causality relationship between economic growth and total asset of deposit money banks/GDP ratio while there is uni-directional causality from private sector credit/GDP ratio to economic growth, and unidirectional causality from economic growth to liquid liability ratio of banks.

Similarly, [11] investigated the direction of causality between financial sector development and inclusive growth between 2000and 2019 in 32 countries in sub-Saharan Africa (SSA) using panel data analysis. Dumitrescu - Hurlin panel causality test showed that the panel of SSA's countries and two other sub-regions (West and South African sub-regions) revealed unidirectional causality whereas the other two (East and Central African) did not reveal any evidence of causality. In the same vein, the study observed some variations at the country-specific level where out of the 32 selected countries, only 24 countries showed evidence of no causality, and 8 countries revealed evidence of unidirectional causality. Thus, the study concludes that both inclusive growth and financial sector development are very weak to influence one another in most sub- Saharan Africa countries since bi-directional causality does not exist.

[12] study investigated whether the complementarities between financial development and assistance from foreign bodies improve economic growth in a number of emerging markets using the panel Fully Modified Ordinary Least Squares (FMOLS) approach, using data spanning from 1994 to 2014. In specific terms, the study tried to ascertain the role played by financial development in the foreign assistance/aid -economic growth nexus i.e Is financial development a link through which foreign aid positively affects economic growth? The result from the study revealed that the complementarities between foreign assistance and financial development represented by domestic private credit provided by banks, domestic credit provided by the financial sector, outstanding domestic private debt securities and stock market turnover led to a significant positive influence on economic growth. The study recommended that emerging markets should instigate policies that deepen the financial sector so that foreign aid would positively further the course of economic growth in those countries.

Varied results were also obtained by [13] in an empirical study that re-evaluated the co-integrating and causal relationship between financial sector development and economic growth in the Economic Community of West African States (ECOWAS) over the period 1960-2005. The ratio of private credit to GDP was employed as an indicator of financial sector development. The empirical results showed that there is a long-run association between financial sector development and economic growth but with diverse directions of causality. Economic growth leads to financial sector development in Burkina Faso, Cote d'Ivoire and Sierra Leone, and bidirectional causality was found in Cape Verde and Liberia, while in Mali and Ghana financial development causes economic growth Therefore, the policy implication is that Mali, Ghana and Cape Verde should embark on sound financial reform while Sierra Leone, Burkina Faso and Cote d'Ivoire should embark on policies that encourage economic growth. These findings contradict the idea that the stage of development determines the causal relationship between financial development and economic growth as these countries are almost at the same stage of development, nevertheless they showed conflicting causality. Furthermore, the use of a single indicator of financial sector development (i.e. ratio of private credit to GDP) may have served as a constraint in the ability of the study to disclose more nature relationship between financial sector development and economic growth in these countries.

[14] examined the casual relationship between banking sector development and economic growth in Nigeria using the Autoregressive Distributed Lag (ARDL) approach to co-integration from the period 1986 to 2016.He employed GDP annual growth rate as a proxy for economic growth while the ratios of domestic credit provided by the banking sector to GDP and the ratio of broad money to GDP were employed as banking sector development indicators. The result showed that banking sector development indicators do not jointly affect economic growth in Nigeria in the short run. Although, domestic credit provided by the banking sector as a ratio of GDP, which measures the degree of financial intermediation, has a positive relationship with GDP, the relationship is insignificant to explain economic growth trend in the long run. Also, the result indicated that the financial sector in Nigeria lacks depth as a result of the negative sign exerted by the coefficient of the ratio of broad money to GDP in the study.

Unfortunately, none of the works reviewed covered the post financial crises period in sub-Saharan Africa.

3. Research methodology

Data from thirty three (33) economies in sub-Saharan Africa from 2009-2020 were drawn (as data availability permits) and investigated using Pooled Mean Group- Auto Regressive Distributed Lag (PMG/ARDL) estimation technique. These 33countries account for about 90 percent of the GDP of the region. They countries are: Nigeria, South Africa, Kenya, Angola, Ghana, Tanzania, Democratic Republic of Congo, Cote-d'Ivoire, Cameroon, Uganda, Senegal, Zambia, Zimbabwe, Botswana, Benin Republic, Burkina Faso, Cabo Verde, Comoros, Guinea Bissau, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Rwanda, Seychelles, Togo, Sierra Leone and Sao Tome and Principe.

Data was drawn from World Bank database of World Development indicators.

The PMG/ARDL model for a certain period and a certain number of units is given in equation 3.1 below:

$$X_{it} = \alpha_{it} + \sum_{i=0}^{m} \gamma_{it} Y_{i,t-j} + \sum_{i=0}^{n} \beta_{it} Z_{i,t-j} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.1)$$

In equation 3.1, $X_{i,t}$ is the dependent variables; γ_{it}, α_{it}, and β_{it} are the parametric coefficients; $Y_{i,t}$ are the internal variables; $Z_{i,t}$ are the control variables; μ_{it} denotes the error term; i denotes a certain number of units, and t represents a given time period.

In its general and structural forms, the model specifications for this study are given below:

$$GDP = f [M_2 \; DCPB \; INT \; ATM \; FDI \;] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.2)$$

The structural form of equation 3.2 is given below:

$$GDP_{i,t} = \beta_0 + \beta_1 M2_{i,t} + \beta_2 DCPB_{i,t} + \beta_3 INT_{i,t} + \beta_4 ATM_{i,t} + \beta_5 FDI_{i,t} + e_{i,t} \ldots\ldots\ldots\ldots(3.3)$$

WHERE:

GDP is Goss Domestic Product annual growth rate, our dependent variable in this study;

M_2 is the ratio of broad money expressed as a percentage of GDP- it measures financial deepening and the degree of monetization in the economy;

DCPB is Domestic credit provided by the banking sector expressed as a percentage of GDP;

INT is interest rate spread otherwise known as interest rate margin;

ATM is electronic banking development indicator that measures access to Automated teller machines (ATMs) per 100,000 adults. It is a measure of ease of access to finance by the population; and

FDI is net foreign direct investment inflow as a percentage of GDP. FDI in this study serves as a control variable.

4. Results and discussion

All results obtained here were computed using Eviews 10 statistical software. Outputs from panel unit root test, panel co-integrations tests, short and long run PMG/ARDL model and Wald coefficient diagnostic test are contained in the following sections.

4.1. Panel Unit root test

Fisher type unit root test using ADF and PP test;**[15]; and [16]** will be employed.

We are going to take the ''summary'' in the panel unit root method given below.

Decision is reached based on majority rule. That is, if majority of the methods pinpoint that the variable is stationary at level I(0), we therefore conclude that the variable is stationary at levels; otherwise we test the variable at first difference I(1).

From table 1, some of the methods suggest that some of the variables are stationary at I(1) while some other methods suggest that some variables are stationary at I (0). In other words, we have a combination of variables stationary at I(1) and I (0). None of the variables is stationary at I(2).

Table 1 Panel Unit root Test

VARIABLES	TEST TYPES	P-VALUE @ I(0)	P-VALUE @ I(1)
GDP	Levin, Lin,Chu. T	0.0685	0.0000
	Im, Pesaran and Shin W.	0.0784	0.0000
	ADF-Fisher Chi-square.	0.0050	0.0000
	PP-Fisher Chi square.	0.0941	0.0000
M2	Levin, Lin,Chu. T	0.5982	0.0000
	Im, Pesaran and Shin W.	0.9271	0.0000
	ADF-Fisher Chi-square.	0.3790	0.0000
	PP-Fisher Chi square.	0.3714	0.0000
INT	Levin, Lin,Chu. T	0.0000	0.0000
	Im, Pesaran and Shin W.	0.0387	0.0000
	ADF-Fisher Chi-square.	0.0001	0.0000
	PP-Fisher Chi square.	0.0001	0.0000
DCPB	Levin, Lin,Chu. T	0.0000	0.0000
	Im, Pesaran and Shin W.	0.2262	0.0000
	ADF-Fisher Chi-square.	0.1037	0.0000
	PP-Fisher Chi square.	0.0396	0.0000
ATM	Levin, Lin,Chu. T	0.0000	0.0000
	Im, Pesaran and Shin W.	0.0000	0.0000
	ADF-Fisher Chi-square.	0.0000	0.0000
	PP-Fisher Chi square.	0.0000	0.0000
FDI	Levin, Lin,Chu. T	0.0000	0.0000
	Im, Pesaran and Shin W.	0.0000	0.0000
	ADF-Fisher Chi-square.	0.0000	0.0000
	PP-Fisher Chi square.	0.0000	0.0000

Source: Eviews 10 output.

4.2. Panel Co-integration Test.

This study will employ the **[17]** Eagle- Granger based test of co-integration.

The following hypothesis will be tested: H_0 =*There is no co-integration among the variables.*

The variables tested are: GDP M2 INT DCPB ATM FDI.

Table 2 TEST TYPE 1: Pedroni Engel and Granger Based Panel Test of Co-integration (No deterministic trend)

S/N	Test	Statistic	Weighted Statistic	Probability Values
1	Panel v-Statistic	-3.129523	-	0.9991
2	Panel rho-Statistic	5.468122	-	1.0000
3	Panel PP-Statistic	-4.488403	-	0.0000*

4	Panel ADF-Statistic	-3.213780	-	0.0007*
5	Panel v-Statistic	-	-3.310435	0.9995
6	Panel rho-Statistic	-	5.651461	1.0000
7	Panel PP-Statistic	-	-5.221279	0.0000*
8	Panel ADF-Stat	-	-3.347447	0.0004*
9	Group rho-Statistic	7.565503	-	1.0000
10	Group PP-Statistic	-9.542497	-	0.0000*
11	Group ADF-Stat	-5.051715	-	0.0000*
TOTAL NUMBER OF CO-INTEGRATING EQUATIONS= 6 out of 11				

SOURCE: Eviews 10 output. NB: Items in asterisks denote test statistics significant at **5%** level of significance which implies the existence of co-integration among the variables.

Table 3 TEST TYPE 2: Pedroni Engel and Granger Based Panel Test of Co-integration (Deterministic Intercept and Trend)

S/N	Test	Statistic	Weighted Statistic	Probability Values
1	Panel v-Statistic	-4.556999	-	1.0000
2	Panel rho-Statistic	7.194733	-	1.0000
3	Panel PP-Statistic	-14.13481	-	0.0000*
4	Panel ADF-Stat	-5.910604	-	0.0000*
5	Panel v-Statistic	-	-5.254096	1.0000
6	Panel rho-Statistic	-	7.813359	1.0000
7	Panel PP-Statistic	-	-8.147817	0.0000*
8	Panel ADF-Stat	-	-2.863572	0.0021*
9	Group rho-Statistic	9.388676	-	1.0000
10	Group PP-Statistic	-15.14826	-	0.0000*
11	Group ADF-Stat	-4.713265	-	0.0000*
TOTAL NUMBER OF CO-INTEGRATING EQUATIONS= 6 out of 11				

SOURCE: Eviews 10 output. NB: Items in asterisks denote test statistics significant at 5% level of significance which implies the existence of co-integration among the variables.

Table 4 TEST TYPE 3: Pedroni Engel and Granger Based Panel Test of Co-integration (No Deterministic Intercept or Trend)

S/N	Test	Statistic	Weighted Statistic	Probability Values
1	Panel v-Statistic	-2.464913	-	0.9931
2	Panel rho-Statistic	4.065735	-	1.0000
3	Panel PP-Statistic	-4.548925	-	0.0000*
4	Panel ADF-Statistic	-4.583392	-	0.0000*
5	Panel v-Statistic	-	-4.801224	1.0000
6	Panel rho-Statistic	-	5.205659	1.0000
7	Panel PP-Statistic	-	-0.909572	0.1815
8	Panel ADF-Stat.	-	-1.798989	0.0360*
9	Group rho-Statistic	6.505340	-	1.0000
10	Group PP-Statistic	-10.20554	-	0.0000*

11	Group ADF-Stat.	-9.246792	-		0.0000*
TOTAL NUMBER OF CO-INTEGRATING EQUATIONS= 5out of 11					

SOURCE: Eviews 10 output. NB: Items in asterisks denote test statistics significant at 5% level of significance which implies the existence of co-integration among the variables.

From the tables 4.2, 4.3 and 4.4, there are cumulatively 17 co-integrating equations out of 33 which imply that the variables for SSA are co-integrated. In other words, they have long run relationship.

Thus, we shall go ahead to develop the short run and long run PMG/ARDL models.

Table 5 Short Run PMG/ARDL Model

Dependent Variable: D(GDP).Independent Variables: M2 INT DCPB ATM FDISample: 2009-2020. Included observations: 363. Dependent lags: 1 (Fixed).Fixed regressors: C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
COINTEQ01	-0.828540	0.147647	-5.611646	0.0000
D(M2)	0.478598	0.152267	3.143153	0.0020
D(INT)	1.085273	0.628885	1.725710	0.0863
D(DCPB)	-0.112899	0.298145	-0.378672	0.7054
D(ATM)	11.84781	10.72045	1.105159	0.2707
D(FDI)	0.012626	0.164343	0.076827	0.9389
C	7.958106	1.890936	4.208554	0.0000
STATISTICS				
Mean dependent var	-0.490717		S.D. dependent var	4.229779
S.E. of regression	2.336547		Akaike info criterio	3.652690
Sum squared resid	873.5123		Schwarz criterion	6.025452
Log likelihood	-487.2326		Hannan-Qui criterio	4.592705

SOURCE: Eviews 10 output.

Table 6 Long Run PMG/ARDL Model

Dependent Variable: D(GDP).Independent Variables: M2 INT DCPB ATM FDISample: 2009-2020. Included observations: 363. Dependent lags: 1 (Fixed).Fixed regressors: C				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
M2	0.144358	0.023659	6.101728	0.0000
INT	-0.056518	0.036263	-1.558562	0.1211
DCPB	-0.211630	0.023381	-9.051391	0.0000
ATM	-0.634541	0.030820	-20.58874	0.0000
FDI	0.109199	0.008406	12.99036	0.0000
STATISTICS				
Mean dependent var	-0.490717		S.D. dependent var	4.229779
S.E. of regression	2.336547		Akaike info criterio	3.652690
Sum squared resid	873.5123		Schwarz criterion	6.025452
Log likelihood	-487.2326		Hannan-Quincriter.	4.592705

SOURCE: Eviews 10 output.

Recall that tables 4.2, 4.3 and 4.4 revealed the presence of co-integration among the variables in model for SSA. In other word, the variables exhibit long run relationship. In table 4.5 above, the coefficient of the "error term" or co-integrating equation (COINTEQ01)being -0.828540 and significant at 5% implies that there is long run causality running from the independent variables to the dependent variable. Furthermore, the negative sign of the error term means that short run deviation or shock is normally corrected in the long run at the speed of 82.85%.

In the short run, only D(M2) has a significant and positive relationship with economic growth. Also, interest rate margin D(INT) is positive in the short run; although insignificant. Positive interest rate spread is inimical to economic growth. All the other variables (except D (DCPD) which is negative) satisfy our a priori expectation - having had positive relationship with economic growth. However, their relationships are insignificant. Thus, the resulting short run model for SSA is given below:

$$D(GDP)_t = 7.96 + 0.48D(M2)_{t-1} + 1.09D(INT)_{t-1} - 0.11D(DCPB)_{t-1} + 11.85D(ATM)_{t-1} + 0.01D(FDI)_{t-1} - 0.83e_t \dots\dots\dots(4.1)$$

In the long run, on the other hand, only the coefficient of M2 exhibits a positive and significant relationship with economic growth in SSA and this is consistent with our a priori expectation. Although, interest rate spread has a negative relationship with economic growth, its relationship is insignificant to explain economic growth trend in SSA in the long run. Indeed, Interest rate margin should have negative relationship with economic growth since it has been observed that countries with developed banking sectors have smaller interest margin and higher economic growth than countries that have undeveloped banking sector. Curiously, both DCPB and ATM negatively and significantly influence economic growth. This is inconsistent with our a priori expectation. FDI, our control variable in the model, has a positive, significant and desirable relationship with economic growth. Thus, the resulting long run model for SSA is given below:

$$D(GDP)_t = 0.14M2_{t-1} - 0.06INT_{t-1} - 0.21DCPB_{t-1} - 0.63ATM_{t-1} + 0.11FDI_{t-1}\dots\dots\dots(4.2)$$

4.3. Test of Joint Significance

To test the joints significance of the indicators in the model, we employed the Wald coefficient diagnostic test. The output is given in table 4.7 below:

Table 7 Wald Coefficient Diagnostic Test

Test Statistic	Value	Df	Probability
F-statistic	191.0294	(4, 160)	0.0000
Chi-square	764.1175	4	0.0000

SOURCE: Eviews 10 output.

$H_0: M2 = INT = DCPB = ATM = 0$.

N.B: The null hypothesis (H_0)literally states that banking sector development indicators in the model do not jointly influence economic growth in sub Saharan Africa.

From the table 4.18, the Chi square test statistical probability value is less than 5%, thus we reject the null hypothesis and accept the alternative hypothesis which states that banking sector development indicators in the model jointly influence economic growth in sub Saharan Africa.

5. Conclusion and Recommendation

So far, this study examined the role of the banking sector in the economic growth and recovery of sub Saharan Africa countries in the post financial crises era. It therefore concludes that banking sector development in sub-Saharan Africa influenced economic growth and recovery in the post financial crises period.

Curiously, this study revealed that financial deepening and the degree of monetization in the economies are the main drivers of short and long run growth in the post crises period. Furthermore, any short run deviation or shock is normally corrected in the long run at the speed of 82.85% in the long run.

Thus, by way of recommendation, it is imperative that policy makers in the region pay greater attention to deepening their economies as this study has shown that it is the main driver of growth in the post financial crises economies of sub Saharan Africa.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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