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`Empirical Research on Financial Efficiency and Economic Growth in Sub-Saharan Africa

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Abstract

This study contributes to the literature on financial efficiency and growth. We show evidence from the effects of controlling institutional variables given the increase in domestic credit. The domestic credit is adverse, with an insignificant effect on per capita income growth. We make two observations from our findings. First, the negative but insignificant coefficients of the measure of bank credit across all model specifications seem to go against the supply-leading hypothesis, as financial development hurts economic growth; nevertheless, given that the impact is insignificant, this draws more into a neutrality hypothesis of no effect. Second, the findings are likely indications of the underdeveloped state of sub-Saharan Africa's financial system, implying that the present state of the financial systems is not robust enough to be a contributory drive towards enhancing economic growth in the region. However, all models have positive control variables (Inflation and gross fixed capital formation). All coefficients of interactions between credit and institutional quality are statistically insignificant (negative in four of six models).

Keywords: foreign direct investment; economic growth; absorptive capacity; human capital; market liberalization.

JEL Classification: O19; O47; O55; F63. F36; G21; O15

Introduction

There are two concerns in this study. First, though there has been a considerable study on the finance-growth nexus, much has been concentrated on the developed nations, leaving developing countries, including Sub-Saharan Africa, less attended (Appiah *et al.,* 2020). Some studies conducted in Sub-Saharan Africa have looked at individual countries like South Africa (Odhiambo, 2010), Nigeria (Adeniyi *et al.,* 2015) and Ghana (Adu et al., 2013). A handful has been conducted using panel data covering a cross-section of countries in Sub-Sharan Africa such as Adusei, 2013; Jung 1986; Menyah et al., 2014; Effiong, 2015; Bist, 2018; Inoue and Hamori, 2016; Ibrahim and Alagidede,2018. The second concern is that a few of these studies have considered that economic growth can simultaneously be influenced by factors that impact financial aspects. For instance, in developed countries, stock markets impact economic growth. This paper contributes to the literature on Sub-Saharan Africa on finance growth by taking considerable account of the institutional factors.

2. Review of Related Literature

The debate on the financial sector-growth nexus can be traced to Schumpeter (1911) and Robinson (1952), Gerschenkron, 1962 cited in (Naz *et al.,* 2022), Patrick (1966) and Lucas (1988). After that, a build-up eventually produced four (supply leading, demand following, feedback and neutrality) hypotheses, which are variations of empirical studies' findings. The supply-leading or finance-led growth hypothesis suggests that financial development causes economic growth (Schumpeter, 1911; Greenwood and Jovanovic, 1990 all cited in Aluko *et al.,* 2020); Aluko *et al.,* (2020); Aluko and Ibrahim, (2020). Aluko and Ibrahim, 2020 have suggested that this thesis demonstrates a change in basic assumptions from the

orthodox positive effect of financial development on economic growth. The positive impact of financial development on economic growth is subject to a threshold level of factors. It applies only to a certain extent – as financial development positively impacts economic growth until it exceeds an optimal level where the impact becomes negative. Demand-following or growth-led finance hypothesis holds that economic growth causes financial development (Robinsons, 1952; Lucas, 1988, both cited in Cheng and Hou, 2022); Nyasha and Odhiambo, 2015 (as cited in Lee *et al.,* 2021). The feedback hypothesis, also known as Patrick's (1966) hypothesis, suggests a bidirectional causality exists between finance and economic growth (Ghirmay, 2004; Akinlo and Egbetunde, 2010, cited in Lee *et al.,* 2021). There is also a neutrality hypothesis which suggests that finance and economic growth do not cause each other (Nyasha and Odhiambo, 2015, as cited in Lee *et al.,* 2021).

Findings from empirical studies on finance growth can also be grouped into these hypotheses, where some fall in the supply-leading hypothesis (Goldsmith, 1969; McKinnon, 2010; Rioja and Valev, 2004, all cited in Cheng and Hou, 2022; Arcand *et al.,* 2015 cited in Ehigiamusoe, 2021). However, it is argued that once credit expansion extends beyond a certain threshold, the positive effect of financial development on economic growth may disappear (Beck *et al.,* 2014; cited in Cheng and Hou, 2022). Similarly, an extensive financial system may impede economic growth (Arcand *et al.,* 2015, cited in Cheng and Hou 2022). Other findings support the demand-following hypothesis (Wu *et al.,* 2010; Beck *et al.,* 2014; Arcand *et al.,* 2015; both cited in Cheng and Hou 2022; Gozgor, 2015; Arcand *et al.,* 2015; Cited in Ehigiamusoe, 2021). Again further findings go with the feedback hypothesis (Ghirmay, 2004) cited in Ehigiamusoe, 2021; and some other studies do not see any significant link between the two, thus supporting the neutrality hypothesis (Gries *et al.,* 2009; all Cited in Ehigiamusoe, 2021).

Empirical results on the financial-growth nexus in Sub-Saharan Africa have depicted these four hypotheses vs supply-leading (Aluko *et al.,* 2020; Aluko and Ibrahim, 2020; Lee *et al.,* 2021); demand following (Aluko *et al.,* 2020; Lee et al., 2021); feedback (Ehigiamusoe, 2021; Lee *et al.,* 2021); and neutrality (*Lee et al.,* 2021). As noted, Lee *et al.* (2021) covered the period of 1996–2019 for their study on nine selected African countries (Ghana, Kenya, Mauritius, Morocco, Namibia, Nigeria, South Africa, Tunisia, and Zambia). They found varied patterns of causality and impulse responses across the selected countries; symmetric demand following, symmetric supply-leading, symmetric feedback and neutrality hypotheses were confirmed. Also confirmed were negative and positive demand-following hypotheses, negative and positive supply-leading hypotheses and negative and positive feedback hypotheses. Aluko and Ibrahim (2020) investigated finance-growth hedging institutional development using data from twenty-eight countries in SSA from 1996–2015 and came up with the following findings:

1. Financial development spurs economic growth, implying a positive impact of financial development on economic growth
2. The growth-enhancing effect is disproportionate, given the level of institutional quality. More specifically, when the International Country Risk Guide (ICRG) based measure of institutions is used as the threshold variable, below the optimal level of institutional quality, financial development does not significantly promote economic growth. Higher finance is associated with growth for countries with institutional quality above the threshold.
3. When World Governance Indicators (WGI) proxy measures institutions, they find a significant effect on financial development, irrespective of whether a country is below or above the threshold.
4. Interestingly, the growth-enhancing effect of finance is higher for low-institution countries.

These differing findings can be explained by some factors, including using different methods in the analysis, using different periods, the choice of predictors and measures of banking development or banking stability and the development level of the banking system and institutional characteristics of countries under consideration (Aluko and Ibrahim 2020, Marwa and Zhanje (2015) or Topcu (2016) cited in Bayar *et al.,* 2021). These factors have been found even in the few studies in Sub-Saharan Africa. For instance, different methods were applied: GMM where five (Aluko *et al.,* 2020; Aluko and Ibrahim, 2020; Apiah, 2020; Lee *et al.,* 2022); and VECM (Ehifiamusoe, 2021). Cheng and Hou (2022) also note the failure in most studies to differentiate the effect of finance–growth nexus at various stages of income level; and the presence of other key factors, such as stock markets and life insurance sectors, which might affect economic growth simultaneously.

3. Methodology and data

3.1. Data

In our study, we use the growth of real per capita GDP as a proxy for economic growth; bank credit as a percentage of GDP which captures financial development in a country; and a set of control variables: human capital, Inflation, and gross domestic fixed capital formation; these are obtained from the World Bank World Economic Indicators. Several institutional variables assess institutional quality: voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law and control of corruption; all are obtained from the

World Bank World Governance Indicators.

3.2. Empirical Model and Estimation Technique

Adeleye *et al.,* (2017)*;* Aluko *et al., .* (2020); Apiah *et al.,* (2020), among others, use GMM, which was developed by Arellano and Bond (1991) and Arellano and Bover (1995). It is useful for panel dynamic models and has a number of advantages, including addressing the problems of omitted variables, measurement errors, endogeneity and country-specific heterogeneity. It also has several tests, including the Hansen test of overidentifying restrictions for the overall validity of the instruments and the Arellano-Bond AR (*2*) test for serial correlation (Arellano and Bond 1991; Arellano and Bover 1995; Blundell and Bond 1998; Osabuohien, Efobi and Gitau 2015; all quoted in Adeleye *et al.,* 2017). There are two types of GMM: difference and system. GMM builds a system of two equations, the original and the transformed one; it uses orthogonal deviations and corrects endogeneity by using more instruments that improve efficiency dramatically. Although system GMM is supposedly superior to difference GMM, our study uses the latter because our data set has a small number of periods not suitable for the system GMM, which uses more instruments. [In all our simulations on the system GMM, the number of instruments far exceeds the number of periods]. We adopt Adeleye *et al.* 's (2017) estimation approach in solving the endogeneity problem by exploiting the time series variation in the data, controlling for unobserved group-specific effects, and allowing for the inclusion of a lagged dependent variable. We first run the estimation using annual data, which is then transformed to an average of three-year periods because we needed to have a smaller number of periods (10) than the number of countries (14) as required by GMM. We adopt Adeleye *et al.* 's (2017) estimation also using the following instrumental variables: the GMM instrument - one-period lagged values of the logged per capita GDP growth; and a set of other instruments: human capital, Inflation, and gross fixed capital formation (% of GDP).

$$lngdp_{it} = \Phi lngdp_{it-1} + \beta credit_{it} + \gamma Z'_{it} + \varphi X'_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (1)$$

Where *lngdp* is the natural logarithm of the growth of GDP per capita; $lngdp_{it-1}$ is the natural logarithm of the lagged growth of GDP per capita, credit is the proxy for financial development; Z' is the vector of institution variables; X' is the vector of control variables; μ is the unobserved country-specific fixed effects; δ is the time trend; Φ, β, φ and γ are parameters; i is the number of cross-sections (=1,…, N); t is the number of time series (=1,…, T) and ε is the error term. The inclusion of the control variables is to determine whether the effect of financial development on economic growth still holds after considering the effects of these covariates on economic growth. In this model specification, the endogenous variable is the lagged log of growth of per capita GDP and others are treated as weakly exogenous bank credit (% of GDP) and strictly exogenous (Z'; and X'). Since a static model will not capture the short and long-run impacts of the regressors on the dependent variable, we use a dynamic model and the difference GMM estimator to capture the nature of economic growth, address the problems of omitted variables, measurement error, endogeneity, and country-specific heterogeneity. Two specification tests assess the consistency of the difference GMM estimator. The Hansen test of over-identifying restrictions tests for the overall validity of the instruments, and the second test examines the null hypothesis that the error term is not serially correlated (Arellano and Bond 1991; Arellano and Bover 1995; Blundell and Bond 1998; Osabuohien, Efobi and Gitau, 2015; all cited in Adeleye *et al.,* 2017).

4. Results

4.1. Summary Statistics

The GDP per capita growth rate, which is widely used as a proxy for economic growth, is usually measured by dividing the national income of a country, i.e., the entire income of all the people arising from a country's gross domestic product (GDP), by the entire population of the country. However, it is a subject of intense debate, including its reliability and measurement errors in estimating it. Several aspects lead to measurement errors. The first is because the estimations are based on the mean income, which is less favourable than the median. In countries with extreme income inequality, the mean is a misleading statistic. Second, the use of GDP distorts the fact that nationals may not use income produced in a country if a large part of it is produced by non-nationals and expropriated to their country of origin. Third, the deflators used are influenced by price adjustments. Fourth, data availability can lead to estimation errors, especially in developing countries. Fifth, exchange rates are used for comparison purposes. Sixth is the treatment of the financial sector and capital. (Carr, 2017; Stiglitz, 2010). Nevertheless, it is widely used due to its availability.

Domestic credit to the private sector (% of GDP), as a measure of financial efficiency and development, shows the ability of banks to transform their mobilized deposits into productive credits and is expected to enhance economic growth; also, as implied in the correlation matrix below it is positively correlated with the growth rate of per capita income. This would allow countries at the lower end of economic growth to have easier access to credit to fund investments more efficiently, thus

increasing economic growth.

The control variables include the inflation rate, which is expected to exert a negative effect on growth; however, reading concurrently with the correlation matrix below positively impacts economic growth and credit extension. Other control variables include human capital and gross fixed capital formation.

The measures of institutional quality are voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law and control of corruption. Empirical evidence supports that quality institutions enhance the government's role in resource allocation, increase the level of financial services available to productive sectors, increase growth and investment and that policies that improve institutional quality will most likely increase growth. Though most institutional indicators and their respective databases have been criticized for biases and are not entirely free of errors, they still are the best data sets for cross-country studies (Kar and Saha, 2012, cited in Adeleye *et al.,* 2017).

The financial development and control variables are from the World Development Indicators (WDI) of the World Bank (2022), while the measures of institutional quality are from the World Governance Indicators (WGI) of the World Bank (2020).

Data in Table 1 are computed from log values; the highest log of economic growth rate (0.289) was recorded in South Africa for the 1990-1992 period, followed by Angola (0.0675) for the 2005-2007 period; Congo DRC had the lowest levels of economic growth with a log of -0.060 and -0.0408 for the periods of 1990-1992 and 193-1995; the subsequent lowest growth (-0.0315) was for Angola in 1990-1992 period. Growth has been slow compared to other developing countries (Dada and Abanikanda, 2022). On institutional quality, most of the countries did poorly, with few having good ratings with some specific measures. For instance, the corruption index was high in Congo DRC and Namibia in 1990-92 and was recorded as lowest in South Africa between 2014 and 2020. We also use the ratio of standard deviation to the mean, called coefficient of variation (CV), to check the size of the standard deviation and, therefore, the relative level of variability. As a rule of thumb, a CV>1 shows a higher variability, and a CV<1 indicates a lower variability. From CV, variability is a severe problem for most variables, human capital, Inflation, and gross fixed capital formation.

Table 1. Descriptive statistics

variable	Obs	Mean	St.dev.	Min	Max	cv
gdp	140	0.008	0.028	-0.061	0.289	3.564
credit	140	-0.778	0.792	-5.303	0.662	-1.018
hcap	140	1.535	0.293	0.719	1.975	0.191
inflation	140	1.710	1.262	-6.853	2.476	0.738
gfcf	140	1.299	0.152	0.802	1.726	0.117
voice	140	-0.174	0.374	-2.000	0.369	-2.148
political	140	-0.262	0.607	-3.788	0.450	-2.317
govern	140	-0.229	0.391	-1.523	0.493	-1.705
regulate	140	-0.294	0.475	-2.743	0.420	-1.614
law	140	-0.291	0.479	-1.888	0.316	-1.646
corruption	140	-0.168	0.365	-1.613	0.377	-2.170

Source: Authors' computation, 2022

4.2. Correlations

Table 2 presents the correlation between variables. Three observations are made here. First, there is an absence of multicollinearity among the variables; apart from government effectiveness which correlates highly with regulatory quality, the rule of law and control of corruption and a one-off high correlation between the rule of law and corruption, all other coefficients indicate a moderate correlation with one another as they are all below the benchmark of 0.8. (Dada and Abanikanda, 2022). Second, the potential relationships between economic growth and other variables are primarily negative. Third, the potential relationships between bank credit and other variables are mostly negative.

Table 2. Correlation Matrix

	gdp	credit	hcap	inflat~n	gfcf	voice	politi~l	govern	regulate	law	corrup~n
gdp	1.000										
credit	0.197	1.000									
hcap	0.067	0.312	1.000								

inflation	0.271	0.666	0.309	1.000							
Gfcf	0.118	0.397	0.344	0.441	1.000						
Voice	-0.027	-0.164	-0.177	-0.142	-0.151	1.000					
political	-0.011	-0.177	-0.218	-0.189	-0.128	0.539	1.000				
Govern	-0.083	-0.115	-0.263	-0.177	-0.348	0.509	0.456	1.000			
regulate	-0.018	-0.131	-0.219	-0.172	-0.306	0.488	0.366	0.798	1.000		
Law	-0.044	-0.197	-0.328	-0.183	-0.302	0.521	0.659	0.801	0.633	1.000	
corruption	-0.031	-0.210	-0.273	-0.129	-0.186	0.478	0.562	0.802	0.693	0.801	1

Source: Authors' computation, 2022

4.3. Results and discussion

The results from the dynamic model are reported in Table 3. Column 1 is the result from the baseline model, while Columns 2 to 7 are those with each measure of institutional quality and their interactions with bank credit. From the baseline model (Column 1), the lag of the logged annual growth of per capita income is not statistically significant for all models. This denotes that economic growth is somewhat not path dependent, which suggests that a country's level of economic growth in the current year has no substantial influence in determining its level of economic growth the following year. Columns 2 to 7 show the role of institutions in the finance-growth nexus captured by interacting bank credit with the six institutional variables. Notably, Columns 4 and 5 give evidence of a positive interaction relationship between bank credit and government effectiveness and regulatory quality; however, these relationships are not significant. The interpretation is that the marginal effect of change in government effectiveness could positively impact economic growth had it been significant, given an increase in domestic credit. Other interaction terms are negative but statistically insignificant, evidencing that institutions could have enhanced growth if they are solid and efficient. Given the choice of one lag length, the specification test results of the AR (*2*) reveal that the models do not suffer from second-order serial correlation, and the Hansen test results show that the instruments used are not over-identified. Thus, reasonable inferences can be made from our results. We make two observations from our findings.

1. First, the negative but insignificant coefficients of the measure of bank credit across all model specifications seem to go against the supply-leading hypothesis, as financial development hurts economic growth. Nevertheless, given that the impact is insignificant, this draws more into a neutrality hypothesis of no effect.
2. Second, the findings are likely indications of the underdeveloped state of sub-Saharan Africa's financial system, implying that the present state of the financial systems is not robust enough to be a contributory drive towards enhancing economic growth in the region.

Otherwise, the interaction of domestic credit with government effectiveness could have been significant so that domestic credit could have influenced economic growth in the presence of government effectiveness. Likewise, the interaction of domestic credit with regulatory quality could have been significant so that domestic credit could have influenced economic growth in the presence of regulatory quality. As for control variables, Inflation and gross fixed capital formation are positive and statistically significant across all columns, implying their significant enhancing effect on economic growth. On the other hand, human capital is negative and statistically significant at a 5% level in four of the seven. This, however, is contrary to an economic theory where the impact should be positive.

Table 3 Difference Estimates (Dependent Variable: gdp (log))

Variable	1	2	*3*	4	5	6	7
lagged gdp	0.034	0.031	0.032	0.037	0.038	0.038	0.035

	-0.670	-0.610	-0.620	-0.710	-0.780	-0.780	-0.690
Credit	-0.006	-0.003	-0.005	-0.007	-0.007	-0.003	-0.004
	(-0.174)	(-0.81)	(-1.30)	(-1.29)	(-1.74)	(-0.38)	(-0.57)
Hcap	-0.024	-0.0219**	-0.0239**	-0.0238**	-0.0281***	-0.0246**	-0.023
	(-2.90)	(-2.43)	(-2.84)	(-2.65)	(-2.98)	(-.78)	(-1.74)
Inflation	0.0137***	0.0137***	0.0143***	0.0137***	0.0129***	0.0136***	0.0144***
	((5.76)	-5.110	-6.300	-5.630	-4.980	-5.510	-6.000
Gfcf	0.0347***	0.0340***	0.0366***	0.0346***	0.0349***	0.0338***	0.0340**
	-3.150	-3.070	-3.180		-3.300	-3.130	-2.830
				-2.970			
Credit*voice		-0.002					
		(-1.12)					
Credit*political			-0.001				
			(-1.12)				
Credit*govern				0.001			
				-0.280			
Credit*regulate					0.002		
					-0.670		
Credit*law						-0.003	
						(-0.64)	
Credit*corruption							-0.002
							(-0.34)
Number of observations	112.000	112.000	112.000	112.000	112.000	112.000	112.000
Time dummies	yes	yes	yes	yes	yes	yes	yes
Number of instruments	13.000	14.000	14.000	14.000	14.000	14.000	14.000
GMM lag	1.000	1.000	1.000	1.000	1.000	1.000	1.000
AR1	0.058	0.062	0.063	0.057	0.051	0.050	0.059
AR2	0.377	0.347	0.328	0.347	0.381	0.413	0.395
Hansen	0.178	0.255	0.135	0.195	0.218	0.218	0.128

Notes: * Significant at 10%, ** significant at 5%, ***significant at 1%, to statistics in parenthesis

Source: Authors' computation, 2022

4.4. Robustness Checks

Our robustness checks are in two forms. First, since the difference GMM is fragile to arbitrary lag limits, we test for lags 2, 3 and 4 but produce very high levels of AR (2), revealing that the models did suffer from second-order serial correlation. However, our test for five lags (see Table 4) produces results different from those of Table 3. For instance, the coefficients for lagged gdp are lower in Table 4 than those in Table 3; human capital is significant for all models in Table 4 (in Table 3, it was significant in 5 out of 7 models).

Table 4 System Difference Estimates (Dependent Variable: gdp (log))

variable	1.	2	3	4	5	6	7
zl.gdp	0.022 -0.450	0.021 -0.410	0.025 -0.500	0.025 -0.520	0.026 -0.510	0.024 -0.480	0.034 -0.710
credit	-0.006 (-1.40)	-0.004 (-0.80)	0-.0047 (-0.97)	-0.008 (-1.57)	-0.008 (-1.54)	-0.005 (-0.60)	-0.006 (-1.18)
hcap	-0.0281*** (-3.04)	-0.0272** (-2.66)	-0.0284*** (-3.09)	-0.027** -2.830	-0.0275*** (-2.98)	-0.0281** (-2.95)	-0.0287** (-2.78)
inflation	0.0147*** -4.940	0.0144*** -4.430	0.0146*** -4.650	0.0145*** -4.870	0.0145*** -4.850	0.0146*** -4.970	0.0136*** -3.900
gfcf	0.0323*** -3.210	0.0333*** -3.170	0.0319** (2.66	0.0320** -2.910	0.0323*** -3.080	0.0327*** -3.170	0.0307** -2.900
Credit*voice		-0.002 (-0.81)					
Credit*political			-0.001 (-0.83)				
Credit*govern				0.002 -0.800			
Credit*regulate					0.002 -0.730		
Credit*law						0.000 (-0.15)	
Credit*corruption							0.001 -0.110
Number of observations	112	112	112	112	112	112	112

Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of instruments	10	11	11	11	11	11	11
GMM lag	5	5	5	5	5	5	5
AR1	0.050	0.052	0.040	0.050	0.047	0.046	0.048
AR2	0.358	0.343	0.330	0.348	0.354	0.368	0.377
Hansen	0.212	0.250	0.273	0.289	0.220	0.190	0.349

Notes: * Significant at 10%, ** significant at 5%, ***significant at 1%, t statistics in parenthesis

Source: Authors' computation, 2022

The second form of robustness is using another measure of financial development, namely deposits (% of GDP), often used in the empirical literature (Levine 2008; Demirguc-Kunt and Levine 2009 both cited in Adeleye *et al.,* 2017) to capture the depth of liquid liabilities with which financial intermediation hinges. Thus, more financial liquidity is expected to enhance credit dissemination and increase economic growth, *ceteris paribus*. The results in Table 5 show a significant impact of financial resources on the region's economy and are evident across all model specifications. Deposit is negative and significant in all seven models. This is contrary to *a priori* expectations. However, the results of the specification tests show that the models are well-specified, which means that this study's results are robust and can be relied upon for helpful inference. Now given, a change from non-significant in credit (Table 3) to significant in deposits (Table 5) raises questions, among others, regarding the usefulness of GMM.

Table 5 System Difference Estimates (Dependent Variable: gdp (log))

variable	1.000	2.000	3.000	4.000	5.000	6.000	7.000
l.gdp 2	0.030 -0.850	0.024 -0.670	0.025 -0.660	0.026 -0.750	0.035 -1.050	0.035 -1.070	0.026 -0.760
deposit	-0.0318*** (-3.41)	-0.0287*** (-3.34)	-0.0297*** (-3.22)	-0.0296*** -3.08)	-0.0352*** (-3.61)	-0.0280** (-2.35)	-0.0292** (-2.71)
hcap	-0.0258** (-2.66)	-0.0257** (-2.80)	-0.0268** (-2.54)	-0.0286*** (-3.07)	-0.0280*** -3.81)	-0.0262*** (-4.3)	-0.0286** (-2.37)
inflation	0.0101*** -3.430	0.0102*** -3.350	0.0105*** -3.390	0.0010*** -3.420	0.0097*** 3.43)	0.0105*** -3.420	0.0101*** -3.440
gfcf	0.0297** (2.51	0.0313** -2.560	0.0341** -2.800	0.0306** -2.600	0.0299** -2.800	0.0285** -2.710	0.0294** -2.640
deposit*voice		-0.002 (-1.19)					
deposit*political			-0.001 (-0.82)				

deposit*govern				0.001 -0.420			
deposit*regulate					0.003 -106.000		
Credit*law						-0.002 (-0.56)	
deposit*corruption							-0.001 (-0.27)
Number of observations	112.000	112.000	112.000	112.000	112.000	112.000	112.000
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of instruments	13.000	14.000	14.000	14.000	14.000	14.000	14.000
GMM lag	1.000	1.000	1.000	1.000	1.000	1.000	1.000
AR1	0.065	0.060	0.072	0.063	0.062	0.062	0.062
AR2	0.374	0.350	0.270	0.362	0.358	0.405	0.391
Hansen	0.394	0.414	0.263	0.427	0.486	0.465	0.398

Notes. * Significant at 10%, ** significant at 5%, ***significant at 1%, to statistics in parenthesis

Source: Authors' computation, 2022

5. Conclusions

Given the ample literature on the finance growth nexus in Sub-Saharan Africa (SSA), this study examines the impact of financial development on economic growth and the role of quality institutions in the region using panel data from 14 countries from 1990 to 2020. The study contributes to the finance growth literature by providing evidence that controlling institutional variables given the increase in domestic credit has a negative but insignificant effect on the growth of per capita income. Evidence is mixed given the persistence of low economic growth, as shown by the positive but insignificant coefficient of the lagged per capita GDP growth. The negative but statistical insignificance of the measure of credit indicates the underdeveloped state of the financial systems prevalent in the region, which are not robust in contributing significantly to economic growth. However, all models have positive control variables (Inflation and gross fixed capital formation). All coefficients of interactions between credit and institutional quality are statistically insignificant (negative in four of six models).

As for policy implications, our results imply that there would be improved economic growth if institutions were efficient. Thus, for governments of SSA to improve economic growth, efforts should be made to ensure that credit extension reaches economic enterprises by developing the state of the financial systems in the region.

Although comprehensive, further research questions relating to the financial-economic growth nexus remain to be answered. Data limitations can restrict the ability to test a range of hypotheses, and identifying causal effects is a serious challenge. It is essential to test the impact of other financial variables, such as the number of branch networks of banks, the liquidity ratio, the cash reserve ratio, agricultural GDP, and international capital flows. This can be taken up in subsequent research.

References

[1] Adeleye, N., Osabuohien, E. and Bowale, E. (2017). The Role of Institutions in the Finance-Inequality Nexus in Sub-Saharan Africa. *Journal of Contextual Economics, 137*(1-2): 173 – 192. DOI:10.3790/jce.137.1-2.173

[2] Adeniyi, O., Oyinlola, A., Omisakin, O., & Egwaikhide, F. (2015). Financial development and economic growth in Nigeria: Evidence from threshold modelling. *Economic Analysis Policy, 47:* 11–21. DOI:10.1016/J.EAP.2015.06.003

[3] Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance, 3*(4)*:* 192–203. https://doi.org/10.1016/j.rdf.2013.11.001

[4] Adusei, M., 2013, 'Finance-growth nexus in Africa: A panel generalized method of moments (Gmm) analysis', *Asian Economic and Financial Review* 3(10): 1314–1324. https://archive.aessweb.com/index.php/5002/article/view/1091

[5] Aluko, O. A. and Ibrahim, M. (2020). Institutions and The Financial Development–Economic Growth Nexus in Sub-Saharan Africa. *Economic Notes, 49*(3):1-16. DOI: 10.1111/ecno.12163

[6] Aluko, O. A., Adeyeye, O. P. and Oladele, P. O. (2020). Finance–Growth Nexus in Sub-Saharan Africa Revisited:

Evidence Based on a New Composite Index. *Economic Change and Restructuring, 53*(2): 333–355.

https://doi.org/10.1007/s10644-019-09253-9

[7] Appiah, M., Li, F. and Frowne, D. I. (2020). Financial Development, Institutional Quality and Economic Growth: Evidence from ECOWAS Countries. *Organizations and Markets in Emerging Economies, 11*(1): 6–17. DOI: https://doi.org/10.15388/omee.2020.11.20

[8] Arellano, M. and Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error-Components Models. *Journal of Econometrics, 68*(1): 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

[9] Arellano, M. and Bond, S. (April 1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies, 58*(2)*:* 277 – 297. https://doi.org/10.2307/2297968

[10] Bayar, Y., Borozan, D. and Gavriletea, M. D. (2021). Banking Sector Stability and Economic Growth in Post-Transition European Union Countries. *International Journal of Finance and Economics, 26*(1): 949–961. https://doi.org/10.1002/ijfe.1829

[11] Bist, J.P., 2018, 'Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries', *Cogent Economics & Finance* 6(1), 1–17. https://doi.org/10.1080/23322039.2018.1449780

[12] Carr, T. (2017). A Critique of GDP Per Capita as a Measure of Wellbeing. *North-eastern University's Student Journal of Economics. https://web.northeastern.edu/econpress/2017/01/23/a-critique-of-gdp-per-capita-as-a-measure-of-wellbeing/ (accessed 18th December 2022)*

[13] Cheng, S. Y. and Hou, H. (2022). Innovation, Financial Development, and Growth: Evidences From Industrial and Emerging Countries. *Economic Change and Restructuring (2022) 55:1629–1653 https://doi.org/10.1007/s10644-021-09361-5*

[14] Dada, J.T. and Abanikanda, E.O. (2022). The Moderating Effect of Institutions in Foreign Direct Investment Led Growth Hypothesis in Nigeria. *Economic Change and Restructuring*, *55*, 903–929. https://doi.org/10.1007/s10644-021-09332-w

[15] Effiong, E., 2015, 'Financial development, institutions and economic growth: Evidence from sub-Saharan Africa', MPRA Paper 66085, University Library of Munich, Munich.

[16] Ehigiamusoe, K. U. (2021). The Nexus Between Tourism, Financial Development, and Economic Growth: Evidence From African Countries. *African Development review*, *33*(2): 382-396. DOI: 10.1111/1467-8268.12579

[17] Ehigiamusoe, K.U. & Lean, H.H., 2018, 'Finance–growth nexus: New insights from the West African Region', *Emerging Markets Finance and Trade* 54(11), 2596–2613. https://doi.org/10.1080/1540496X.2017.1364623

[18] Ibrahim, M. and Acquah, A. M. (2021). Re-Examining the Causal Relationships Among FDI. Economic Growth and Financial Sector Development in Africa. *International Review of Applied Economics, 35*(1): 45–63. https://doi.org/10.1080/02692171.2020.1822299

[19] Ibrahim, M. & Alagidede, P., 2018, 'Nonlinearities in financial development–economic growth nexus: Evidence from sub-Saharan Africa', *Research in International Business and Finance* 46, 95–104. https://doi.org/10.1016/j.ribaf.2017.11.001

[20] Inoue, T. & Hamori, S., 2016, 'Financial access and economic growth: Evidence from sub-Saharan Africa', *Emerging Markets Finance and Trade* 52(3), 743–753. https://doi.org/10.1080/1540496X.2016.1116282

[21] Jung, W. S. (1986). Financial development and economic growth: International evidence. *Economic Development and Cultural Change, 34*(2), 333–346. https://www.journals.uchicago.edu/doi/10.1086/451531

[22] Lee, C. C., Olasehinde-Williams, G. and Olanipekun, I. (2021). Financial Systems, Regulatory Quality, and Economic Growth. *The Journal of International Trade and Economic Development, 30*(2); 246–274 https://doi.org/10.1080/09638199.2020.1847172

[23] Lucas, R. E. Jr. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22: 3-42. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.parisschoolofeconomics.eu/docs/darcillon-thibault/lucasmechanicseconomicgrowth.pdf

[24] Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling, 37*, 386–394. DOI:10.1016/J.ECONMOD.2013.11.044

[25] Naz, S. A. And Gulzar, S. (2022). Impact of Islamic Finance on Economic Growth: An Empirical Analysis of Muslim Countries. *The Singapore Economic Review*, *67*(1): 245–265 DOI: 10.1142/S0217590819420062

[26] Odhiambo, N.M., 2010. Finance-investment-growth nexus in South Africa. an ARDL-bounds testing procedure, Econonmic Change Restruct, 43: 205–219. https://link.springer.com/article/10.1007/s10644-010-9085-5
Patrick, H.T. (1966). Financial Development and Economic Growth in Underdeveloped Countries. *Economic Development and Cultural Change, 14*(2): 174–189 http://dx.doi.org/10.1086/450153

[27] World Bank (2022). World Development Indicators, https://databank.worldbank.org/source/world-development-indicators

[28] World Bank (2022). World Governance Indicators, https://www.unesco.org/en/world-media-trends/worldwide-governance-indicators-wgi#:~:text=The%20Worldwide%20Governance%20Indicators%20(WGI,Regulatory%20Quality%3B%20Rule%20of%20Law%3B