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Article

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Does financial sector development promote economic globalization in Africa?

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Abstract

Purpose – This paper investigates whether financial sector development promotes economic globalization (EG) using data from 45 African countries.

Design/methodology/approach – Using panel data of the selected African countries, the two-step system generalized method of moments estimation technique which is capable of solving any possible endogeneity problem is employed for the empirical analysis.

Findings – The main finding is that all measures of financial sector development have a significant positive impact on EG in Africa. The results suggest that improving the financial sector development in a holistic manner is key in fostering EG in Africa.

Originality/value – This present paper uses broader measures of EG and financial sector development. Using broader measures of these variables widens the policy scope in terms of policy adoption and implementation.

Keywords Economic globalization, Trade globalization, Financial globalization, Financial sector development, Africa

Paper type Research paper

1. Introduction

The role of economic globalization (EG) in fostering economic growth and development cannot be overemphasized. EG – which comprises both trade and financial globalization (FG) – has been recognized as a key economic policy strategy that could help economies grow and prosper (Abeka *et al.*, 2021; Asongu *et al.*, 2020a; Gozgor and Can, 2017; Grossman and Helpman, 2015; Kollias and Tzeremes, 2023; Verkhovets and Karaoguz, 2022). While trade globalization (TG) involves trade in goods and services, trade partner diversity, trade regulation, trade taxes, tariffs and trade agreements, FG consist of foreign direct investment (FDI), portfolio investment, international debt, international reserves, international income payments, investment restrictions, capital account openness and international investment agreements. It is therefore not surprising that EG became the new order after the liberalization policies that proceeded the various economic reforms in the early 1980s for many developing countries. According to Scholte (2008), EG can be defined in the following perspective; (1) internationalization – increase in interdependence and transactions among countries, (2) liberalization – removing all restrictions imposed on resources movement among countries,

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(3) universalization – homogenization with economic convergence of countries and (4) westernization – modernization being spread across countries.

It is worth mentioning that EG is reported to impact positively on economies (Asongu *et al.*, 2020b; Gaies *et al.*, 2019; Gozgor and Can, 2017; Grossman and Helpman, 2015; Kihombo *et al.*, 2022; Potrafke, 2015). For instance, Gozgor and Can (2017) report that, EG has the potency of sustaining economies if well promoted and managed. Kihombo *et al.* (2022) further add that EG boosts production and economic growth. Additionally, EG enhances technological transfers, financial resources inflows, economic growth and development, welfare, poverty reduction, employment and economic participation of women (Awad, 2019; Baidoo *et al.*, 2023; Dreher, 2006; Dreher *et al.*, 2012; Gozgor, 2017; Jahanger *et al.*, 2022; Li *et al.*, 2022; Meinhard and Potrafke, 2012; Mensah and Mensah, 2021; Nissanke and Thorbecke, 2007). Aside the positive effect of EG on economic growth and development of economies, negative and insignificant influence have also been reported. For instance, Majidi (2017), Aini *et al.* (2018) and Dorn *et al.* (2018) have indicated that EG retards economic growth because it leads to brain drain from developing countries. These authors further report that EG reduces welfare, worsens income inequality and impacts negatively on trade balance. Studies (such as Anyanwu, 2006; Barry, 2010; Lee *et al.*, 2015) have revealed that EG has no effect on economic growth. The authors attributed this insignificant effect of EG to the fact that developing countries tend to depend largely on their natural resources and therefore do not pay much attention to EG process. This has further made some countries marginalized in the EG process and as a result, the full benefit associated EG is often not realized.

These benefits notwithstanding, the level of EG of African countries is not impressive. Data from the Swiss Economic Institute on the performance of EG indicators indicate that Africa lags behind other continents of the world. For instance, data on African countries in terms EG, comprising trade and financial are far below Europe and Central Asia, North America, East Asia and the Pacific and Latin America and the Caribbean as well as the world average. Specifically, EG average figure of Africa for 1970 to 2017 was 44.40 compared with Europe and Central Asia (60.00), North America (59.40), East Asia and Pacific (50.30), Latin America and Caribbean (46.40) and the world (48.70) for the same period. The story is not different when the trends of EG (comprising trade and financial) of Africa is compared with other continents (see Figures A1-A3 in the Appendix). It is observed from the figures that Africa lags behind all the regions with the exception of South Asia. It is also evident that, the performance of Africa is below the world average. For instance, with regard to the overall EG performance, it is observed that, Europe and Central Asia leads, and this is followed by North America, Middle East, East Asia and Pacific, Latin America and Caribbean, Africa and South Asia in that order. This gloomy performance of Africa raises concerns because it will have effect on economic performance of the continent and this therefore calls for urgent attention of leadership of Africa to implement policies and strategies aimed at improving on EG considering its associated benefits; this needs to be guided by empirical research like this current paper.

Following from the discussions afore, it becomes imperative that what drives EG is well understood. Interestingly, financial sector development is asserted to be key in promoting EG (Bunje *et al.*, 2022; Desai *et al.*, 2006; Hsu and Pereira, 2022; Islam *et al.*, 2020; Katircioglu and Zabolotnov, 2020; Kumarasamy and Singh, 2018; Nkoa, 2018; Sen Gupta and Atri, 2018). For instance, improvement in financial sector development ensures that there are diversified funding sources which in turn facilitate, among others, FDI activities, international trade flows, portfolio investment, financial resources flows and easy access to credit by investors for cross-border transactions. Also, improvement in the financial sector development ensures that cost of lending is low, and this in turn helps investors to have cheaper credit to facilitate their investment activities. Desai *et al.* (2006) further adds that financial sector development increases listed companies' liquidity which eventually reduces the cost of capital for investors and subsequently enhances EG.

Despite the theoretical prediction that financial sector development is likely to enhance EG, empirical studies, especially those on Africa, have not investigated this phenomenon from a broader perspective – using broader measures of both financial sector development and EG (Agbloyor *et al.*, 2013; Bunje *et al.*, 2022; Ezeoha and Cattaneo, 2012; Nkoa, 2018; Osabuohien *et al.*, 2017; Sare *et al.*, 2019; Yakubu *et al.*, 2018). The emphasis on financial sector development has been on indicators such as credit to private sector, broad money supply and domestic credit provided by financial institutions which do not necessarily focus on the financial market aspect of financial sector development and hence limits the scope of such studies. Similarly, EG have mainly used trade openness and FDI as a measure. There is no doubt, therefore, that the limited scope regarding the measurement of financial sector development and EG will have a dire consequence on policy adoption and implementation and hence the need to consider broader measures as considered in this present study.

The contributions of this paper are in at least two folds. First, the present study focuses on African countries for effective policy purposes. The reason for focusing on African countries is due to the fact that, it is the continent that has most of its countries being characterized as developing and majority of its citizens deprived of economic prosperity. To this end, it becomes imperative to investigate factors that are likely to promote EG for its benefits to be fully derived in the context of African countries. The second contribution of the paper lies in the broader measurement of financial sector development and EG. Specifically, the three indicators of financial sector development by the international monetary fund – financial sector development, financial institution and financial market indexes which also capture the access, efficiency and depth aspect of the financial sector are used as measures of financial sector development while the Swiss Economic Institute's EG index and its two main dimensions – trade and FG indicators – are used as measures of EG. Doing so in the context of Africa is crucial because the only studies the present paper is aware of which considered similar measure of financial sector development are those of Katircioglu and Zabolotnov (2020) and Islam *et al.* (2020); however, these studies do not focus on Africa. Last but not least, the present study uses the two-step system generalized method of moments as the estimation strategy for the empirical analysis to overcome potential endogeneity concerns.

The remainder of the paper is structured as follows. The next section focuses on the literature review, and this is followed by the empirical methods, and the empirical analysis and discussion in the third and fourth sections respectively. Finally, the paper concludes with policy suggestions.

2. Literature review

The theoretical link between financial sector development and EG can be explained by the Heckscher–Ohlin model of international trade (Heckscher and Ohlin, 1991) and the model of heterogeneous firms with credit constraints (Manova, 2013). The Heckscher–Ohlin model provides evidence for the basis for international trade (TG) as it indicates that countries should engage in international trade by exporting the commodities that they produce efficiently in terms of cost and import those that are less efficiently produced. In this model, the main basis for international trade is resource endowment and therefore the amount of capital stock a country possesses plays a crucial role in TG. However, for capital stock accumulation to be effective to facilitate TG, the role of financial sector development of countries cannot be neglected. The financial system of countries plays a central role in mobilizing funds for investment which also in turn aid in production and trade. This therefore connotes that how well a country's financial system is developed is key to facilitating TG as far as capital stock accumulation is concerned.

With reference to the heterogeneous firms with credit constraints model, because different firms require different amount of capital, credit constraint can affect firms' decisions regarding participation in trade (TG) and FDI (FG). For instance, firms need huge sums of capital to establish or purchase production equipment to effectively participate in the global economy.

However, in many developing countries, financial institutions are unable to provide the needed funds to enable firms participate in the global economy due to their under-developed nature (Klein *et al.*, 2002). Manova (2013) reveals that, higher financial sector development has a positive impact on the flows of trade and financial resources due to easy access to funds. The theoretical prediction shows that, some firms are often prevented from engaging in the global economy due to financial constraint. This outcome is attributed to inefficiencies in the financial sector, because, well-developed financial systems are often characterized by diversified source of funding, and this helps investors to have easy access to external source of funding which in turn facilitates international transactions and improvement in EG (Bellone *et al.*, 2010; Huang *et al.*, 2017, 2019). It can therefore be construed that financial sector development has the tendency of enhancing EG.

Aside theoretical predictions, some empirical studies including those on African countries have been devoted to the relationship between financial sector development and EG (Agbloyor *et al.*, 2013; Bahri *et al.*, 2018; Beck, 2002; Bunje *et al.*, 2022; Dellis, 2018; Desbordes and Wei, 2017; Ezeoha and Cattaneo, 2012; Islam *et al.*, 2020; Katircioglu and Zabolotnov, 2020; Kaur *et al.*, 2013; Nkoa, 2018; Osabuohien *et al.*, 2017; Sare *et al.*, 2019; Soumare and Tchana Tchana, 2015; Tsaouri and Makina, 2018; Yakubu *et al.*, 2018). However, these studies have not used broader measures of financial sector development and EG. While financial sector development is mainly proxied by broad money, bank credit, quasi money, banks assets, liquidity liability, private sector credit, domestic credit provided by financial sector, stock market capitalization and stock market turnover, EG has been measured using trade openness and FDI. Specifically on Africa, while studies by Ezeoha and Cattaneo (2012), Agbloyor *et al.* (2013) and Nkoa (2018) focus on financial sector development and FDI, others like Yakubu *et al.* (2018), Sare *et al.* (2019) and Bunje *et al.* (2022) focused on financial sector development and international trade.

For instance, Yakubu *et al.* (2018) examine the effect of financial sector development (measured by private sector credit and domestic credit provided by financial sector) on trade flows for 46 African countries for the period 1980 to 2015. The results indicate that private credit impact negatively on trade flows. The results further show that domestic credits affect trade flows positively which is consistent with that of Bunje *et al.* (2022). Nkoa (2018) estimates the impact of financial sector development on FDI inflows for the period 1978 to 2003. The study measures financial sector development using quasi money, bank credit to private sector, bank deposit, capital market capitalization and stock market value traded. The results indicate that there is a significant positive relationship between the financial sector development indicators and FDI. Sare *et al.* (2019) investigate the effect of financial sector development (measured by private and domestic credits) on international trade of 46 African countries for the period 1980 to 2016. The results show that the impact of financial sector development on international trade is negative and insignificant. Also, Bunje *et al.* (2022) examine the effect of financial sector development (Measured by financial institutions and financial market index) on trade flows in Africa for the period 1990 to 2019. The results reveal that financial sector development indicators affect trade flows positively.

From the review of literature, it is observed that the measurement of financial sector development and EG have not been wide enough to capture the broad effect of the former on the latter in order to efficiently guide policy formulation and implementation. Past studies have mostly measured EG by either using trade or FDI which do not capture the policy aspects of EG. For financial sector development, apart from studies such as Kaur *et al.* (2013), Desbordes and Wei (2017), Dellis (2018) and Islam *et al.* (2020) in other continents which uses measures that capture financial markets, most studies, especially those on Africa have mostly used indicators such as domestic credit to private sector, liquid liability, money supply and/or domestic credit provided by financial institutions which capture the financial institutions aspect of the financial sector. However, considering the multi-dimension nature of the financial sector, it is important to use a broader measure which captures both the financial institutions and markets aspects. Doing this will help policymakers to consider policies that seek to enhance EG in a wider perspective.

It is also evident that, with the indicators of financial sector development used, especially in African studies, the findings are inconclusive, which might be due to the indicators used. Whereas some have reported a significant negative relationship (Ezeoha and Cattaneo, 2012; Yakubu *et al.*, 2018), others have also reported a significant positive relationship (Agbloyor *et al.*, 2013; Osabuohien *et al.*, 2017; Nkoa, 2018); insignificant relationship has also been reported (Sare *et al.*, 2019). This, therefore, indicates that, the indicators used might not be enough to reveal the exact effect. It therefore becomes imperative to provide a study that considers financial sector development and EG from a broader perspective.

As a result, this present study uses a measure of financial sector development (from the International Monetary Fund (IMF) database) which capture both the financial institutions and markets. A measure of EG (using the EG index, its two main dimensions—trade and FG) which capture a wider dimension has also been used in this study. Doing this gives policymakers a broader perspective in terms of policy adoption and implementation aimed at improving financial sector development and EG in Africa.

3. Methodology

This section focuses on the method the paper adopts, and it is divided into three main subsections. The first part details the model specification, whereas the second and third sections describe the data and the empirical estimation strategy, respectively.

3.1 Model specification

Following the theories and past studies (such as Bunje *et al.*, 2022; Sare *et al.*, 2019) reviewed, this paper specifies Equation (1) for estimation.

$$EG_{it} = \delta_0 + \delta_1 EG_{it-1} + \delta_2 FD_{it} + \delta_3 M_{it} + \gamma_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where EG_{it} represents EG and EG_{it-1} is its lag which measures the persistence of EG over time. FD_{it} represents financial sector development, and M_{it} denotes a vector of control variables which include capital, inflation, income, exchange rate, quality of institutions, infrastructure and government expenditure that affect EG. The individual and time specific effects are denoted by γ_i and γ_t , respectively, and ε_{it} is the white noise error term assumed to be independent and identically distributed (iid), with zero mean and constant variance. The parameter which captures the effect of financial sector development – the variable of interest – on EG is δ_2 , and it is expected to be positive. δ_3 is the coefficient of the control variables. δ_0 and δ_1 are the intercept and the coefficient of the lagged dependent variable, respectively; $i = 1, 2, 3, \dots, N$ and $t = 1, 2, 3, \dots, T$; N and T denote country and time respectively.

3.2 Data

With regard to the data, this study uses a sample of 45 African countries (see Table A1 in the Appendix for list of countries) over the period 1996 to 2019. The choice of countries and time period is due to data availability on variables used in the study. Although the study period has yearly data on individual variables, the present study uses a 5-year data points based on averages (1996–1999; 2000–2004; 2005–2009; 2010–2014; 2015–2019) for all the variables. The reason for using the average data points is that, according to Sala and Trivín (2014), it helps to focus on the long-run analysis which is important for policy purposes. Additionally, as noted by Islam (1995), the average data points helps to eliminate any outliers in the data that may affect the efficacy of the results negatively. With respect to the variables of interest, this paper uses the Swiss Economic Institute's EG index and its two main dimensions – trade and FG indicators. However, to ensure that our results are robust to alternative measures of EG, trade openness and FDI indicators are used [1]. Regarding financial sector development, this paper uses three indicators – overall financial sector development index, financial institution index

and financial market index. These indexes are broad as they capture both financial institutions and markets as well as the access, efficiency and depth aspect of the financial sector of economies. The definition of all variables used and sources are summarized in Table 1. For the quality of institutions and infrastructure variables, this study constructs a composite indexes with the aid of principal component analysis (PCA) techniques [2]. With regard to the quality of institution variable, the primary indicators are six – voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. Those of the infrastructure variable are based on three primary variables– fixed telephone subscription, mobile cellular subscription and individual Internet usage. While the indicators for quality of institutions have values ranging from –2.5 to +2.5, with negative and positive values

Table 1. Variable definition and sources of data

Variable	Proxy/definition	Notation	Data sources
Economic globalization	Economic globalization index	EG	Swiss Economic Institute
	Trade globalization index	TG	
	Financial globalization index	FG	
	Trade openness (Trade as a share of GDP)	TR	
	Foreign direct investment (Net inflows, share of GDP)	FDI	
Per capita real income	Per capita real income (Constant, 2010 US\$)	Y	World Bank's World Development Indicators database (2020)/World Bank's World Governance Indicators database (2020)
Quality of institutions	Institutional quality index constructed from voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption based on principal component analysis (PCA)	QII	
Capital	Gross fixed capital formation (share of GDP)	K	
Inflation	Consumer price index (annual)	INF	
Exchange rate	Official exchange rate (LCU per US\$, period average)	EXR	World Bank's World Development Indicators database (2020)
Infrastructure	Infrastructure index constructed from fixed telephone subscription, mobile cellular subscription and individual internet usage based on principal component analysis (PCA)	INFRA	
Government expenditure	General government final consumption expenditure (share of GDP)	GE	International Monetary Fund database (2020)
Financial sector development index	Financial sector development index	FDIND	
Financial institution index	Financial institution index	FIIND	
Financial market index	Financial market index	FMIND	

Note(s): The values of economic, trade and financial globalization indexes range from 1 to 100 with 1 and 100 indicating lower and higher level of globalization respectively. Quality of institution primary variables have values ranging from –2.5 to +2.5 with –2.5 and + 2.5 denoting weaker and stronger institutions, respectively. Financial sector development index, financial institution index and financial market index which also capture the access, efficiency and depth aspect of financial institutions and markets range from 0 to 1 with 0 and 1 representing less and more financial sector development, respectively

Source(s): Authors' compilation

representing weaker and stronger institutions, respectively, fixed telephone subscription and mobile cellular subscription are measured in terms of per 100 people, whereas individual Internet usage is measured as percentage of population. To facilitate comparison and interpretation of the outcomes from the index constructed, the method of min-max transformation is applied to normalize all the primary indicators on a continuous scale of 0–1, where 0 (1) represents weak (strong) institutions for quality of institutions variables and poor (good) infrastructure for infrastructure variables. Summary of descriptive statistics and details of the primary variables used to construct institutions and infrastructure indexes as well as the results from the PCA are reported in [Tables 2 and 3](#), respectively.

Table 2. Summary of descriptive statistics

Variable	Obs	Mean	Std. dev	Min.	Max.
EG (index)	225	43.238	10.640	22.287	83.455
TG (index)	225	40.747	12.755	14.396	82.066
FG (index)	225	45.796	11.351	25.389	84.843
TR (% of GDP)	225	67.921	32.504	1.387	229.638
FDI (% of GDP)	225	4.028	7.481	–2.816	70.308
FDIND (index)	225	0.142	0.111	0.003	0.640
FIIND (index)	225	0.215	0.129	0.004	0.722
FMIND (index)	225	0.064	0.111	0.000	0.535
Y (GDP per capita/CPI)	225	61.998	486.485	1.128	7251.211
K (% of GDP)	225	22.088	8.360	3.554	49.627
INF (CPI)	225	95.866	61.666	0.251	708.266
EXR (LCU per US\$)	225	528.131	1015.345	0.217	8526.922
GE (% of GDP)	225	14.464	6.951	1.146	42.938
INFRA (index from PCA)	225	–0.014	0.916	–1.643	1.513
QII (index)	225	–0.007	1.183	–2.359	2.200

Source(s): Authors' estimations

Table 3. Principal component analysis of institutional quality and infrastructure indicators

Component	Eigen value	Proportion explained	Primary Variables	Eigen vectors	Correlation coefficients	Bartlett (p-value)
<i>Quality of institution index</i>						
Component 1	2.586	0.431	VA	0.381	0.677	0.000
Component 2	1.035	0.173	PS	0.336	0.680	
Component 3	0.824	0.137	GE	0.462	0.631	
Component 4	0.595	0.099	RQ	0.367	0.674	
Component 5	0.526	0.088	ROL	0.479	0.815	
Component 6	0.434	0.072	COC	0.405	0.530	
<i>Infrastructure index</i>						
Component 1	1.806	0.602	FTS	0.153	0.562	0.000
Component 2	1.001	0.333	MCS	0.689	0.774	
Component 3	0.181	0.065	INTUS	0.705	0.885	

Note(s): VA, PS, GE, RQ, ROL and COC respectively denote voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. FTS, MCS and INTUS respectively denote fixed telephone subscription, mobile cellular subscription and individual internet usage. The number of principal components was selected by the Kaiser criterion of Eigen value greater than one. For the Bartlett's test of sphericity, the null hypothesis of the variables not intercorrelated is tested against the alternative hypothesis that the variables are correlated

Source(s): Authors' estimations

It must be emphasized that the values of EG variable (including trade and financial) ranges from 1 to 100 with 1 and 100 indicating lower and higher level of globalization respectively. Quality of institution index variable is an index created from six primary variables (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption). Infrastructure index variable is an index created from three primary variables (fixed telephone subscription, mobile cellular subscription and individual internet usage). Financial sector development variables (including financial institutions and markets) range from 0 to 1 with 0 and 1 representing less and more financial sector development respectively. Trade, FDI, capital and government expenditure are measured as percentage of gross domestic product (GDP) (further details on the variables in terms of definition and measurement could be seen in [Table 1](#)).

The results in [Table 2](#) show that the average values for EG, TG and FG are 43.24, 40.75 and 45.80, respectively. The minimum (maximum) values for EG, TG and FG are 22.29 (83.46), 14.40 (82.07) and 25.39 (84.84), respectively. It is observed that these figures are relatively low compared with other continents and the world average as shown in [Figures A1–A3](#) in the Appendix. This means that the performance of African continent in terms of EG is low and need to be improved. Trade and FDI (measured as a share of GDP) have mean values of 67.92% and 4.03%, respectively. The minimum and maximum values for trade are 1.39% and 229.64%, respectively. The minimum and the maximum values for FDI are also –2.82% and 70.31%, respectively. Regarding the financial sector development measures, it is revealed that the mean values for overall financial sector development, financial institutions and financial markets 0.14, 0.22 and 0.06. The value of 0.06 for financial markets means that African continent is not doing well in terms of financial markets. The minimum (maximum) values for the overall financial sector development, financial institutions and financial markets are 0.003 (0.64), 0.004 (0.72) and 0.00 (0.55), respectively. These relatively low values of financial sector development (comprising financial institutions and markets) show that African continent is lagging behind other continents and the world average as shown in [Figures A4–A6](#) in the Appendix.

With regard to the PCA analysis for quality of institutions and infrastructure ([Table 3](#)) the Bartlett’s test of sphericity is used to test whether the primary variables for both quality of institutions and infrastructure used to generate the composite index are correlated or not. For the test, the null hypothesis which indicates that the primary variables are not intercorrelated is tested against the alternative hypothesis that the variables are correlated. The results in [Table 3](#) indicate the rejection of the null hypothesis. This is because, the Bartlett’s test is highly significant given the probability value of 0.00. This implies that the primary variables of both quality of institutions and infrastructure are correlated. The number of principal components is selected by the Kaiser criterion of eigenvalue value greater than 1. With regard to the quality of institutions, the study constructs the composite index from the first two components since component 1 and component 2 have eigenvalues of 2.59 and 1.04, respectively (see [Table 3](#)). The proportion explained by components 1 and 2 are 0.43 and 0.17%, respectively. These give a cumulative proportion explained of about 60% (the summation of 0.43 and 0.17). Also, with respect to the infrastructure variable, the study constructs the composite index from the first two components. The eigenvalues for components 1 and 2 are 1.81 and 1.00, respectively. The proportion explained by the two components are 0.60 (component 1) and 0.33 (component 2) as shown in [Table 3](#). These give a cumulative proportion explained of about 93% (summation of 0.60 and 0.33).

Given that the first two components of both quality of institutions and infrastructure have eigenvalues of greater than 1, the study follows the approach by [Chen and Woo \(2010\)](#) to compute the composite index for quality of institution and infrastructure for the analysis using the formula $\frac{\sum_{i=1}^p \gamma_i PC_i}{\sum_{i=1}^p \gamma_i}$, where γ_i ($i = 1, \dots, p$) is the i th eigenvalue and PC_i is the i th principal

component selected by the Kaiser criterion.

The study further constructs scatter plots to show the relationship between financial sector development and EG measures (see [Figures A7 to A9](#) in the Appendix). The scatter plots show that financial sector development and EG are positively related. EG improves as the financial sector gets developed as shown by the upward trend lines in the figures.

3.3 Empirical estimation strategy

This paper estimates [Equation \(1\)](#) using the two-step system generalized method of moments (generalized method of moments (GMM)) proposed by [Blundell and Bond \(1998, 2023\)](#) because of the advantages it has (such as efficient handling of endogeneity, autocorrelation and simultaneity bias problems, properly exploiting the between and within variations in the data and producing less bias and efficient estimates) over other panel estimation techniques like the random effects (RE), fixed effects (FE) and pooled ordinary least squares (POLS). Techniques such as POLS, RE and FE are not able to handle efficiently the issue of endogeneity that is introduced into [Equation \(1\)](#) by the lag of the dependent variable as well as other possible reverse causality that may be present in the equation. The lag of the dependent variable being introduced as an explanatory variable causes an endogeneity problem because it is correlated with the error term; and this is due to the fact that there are unobserved variables that are captured in the error term which might also correlate with the lagged dependent variable. Also, there is a possible two-way relationship that is likely to exist between EG and financial sector development. For instance, in as much as financial sector development affects EG through the facilitation role it plays in funds mobilization, it is also plausible that EG will affect financial sector development due to proliferation of foreign technology across countries which improves the efficiency in the way activities are conducted by the players in the financial sector. For example, foreign technologies that are likely to improve financial sector development across countries include the use of online or internet banking system, debit and credit cards and automated teller machines among others.

These therefore cause a possible reverse causality, and so, there is the need to estimate [Equation \(1\)](#) with a method that could handle these issues efficiently, hence, the use of the system-GMM. Moreover, the system-GMM technique solves the problem of endogeneity by employing the lagged value of the dependent variable as the regression instruments. Furthermore, to ensure consistent and reliable outcome from the estimations, this paper conducts some diagnostic tests. To ascertain that there is no second order serial correlation, the Arellano and Bond test is employed to establish its existence or otherwise ([Arellano and Bond, 1991](#)). Lastly, the Hansen J-test is employed to establish the validity of the instruments through the test of over-identifying restrictions.

It must be mentioned that [Equation \(1\)](#) is estimated five times using different measures of EG – overall EG index, TG index, FG indexes, trade openness and FDI. Also, in each of the estimations, the various indicators of the financial sector development – overall financial sector development index, financial institution index and financial market index – are included in the analysis.

Finally, to effectively guide policymakers in terms of policy adoption and implementation, this paper estimates the long-run coefficients (with the exception of the lag of the dependent variable) which measure the permanent impact of all the explanatory variables in addition to the short-run coefficients which measure the immediate impact represented by the parameters (δ_2 and δ_3) in [Equation \(1\)](#). Following [Papke and Wooldridge's \(2005\)](#) approach, the long-run coefficients are obtained by multiplying the short-run parameters by $(1 - \delta_1)^{-1}$, where δ_1 is the coefficient of the lagged dependent variable in [Equation \(1\)](#).

4. Empirical results and discussion

This section of the paper presents the empirical findings and proceeds with the discussion of the results. The results for the EG index, TG index and FG index and financial sector development measures are reported in [Tables 4–6](#), whereas those of trade openness and FDI

Table 4. Short- and long-run estimates of the effect of financial development on EG in Africa

Variable	Short-run results			Long-run results		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
EG _{<i>i,t-1</i>}	0.626*** (0.194)	0.493*** (0.174)	0.813*** (0.160)	—	—	—
K	0.741*** (0.247)	0.591** (0.281)	0.284*** (0.0823)	1.983* (1.0344)	1.166** (0.473)	1.519 (1.376)
INF	0.00141 (0.0201)	0.0110 (0.0107)	0.0179 (0.0125)	0.00379 (0.0532)	0.0217 (0.0191)	0.0956 (0.126)
Y	-0.0933** (0.0377)	-0.0593 (0.0449)	0.0319 (0.0212)	-0.250 (0.190)	-0.117 (0.0898)	0.171** (0.0660)
EXR	-0.00143** (0.000613)	-0.00104 (0.000716)	0.00335 (0.00270)	-0.00382* (0.00218)	-0.00205 (0.00125)	0.0179 (0.0142)
QII	-0.378 (0.480)	-0.153 (0.432)	-0.158 (0.373)	-1.0122 (1.241)	-0.303 (0.856)	-1.846 (1.768)
INFR	0.0212 (0.0132)	0.0274 (0.0201)	-0.00519 (0.00835)	0.0569 (0.0413)	0.0541 (0.0350)	-0.0278 (0.0349)
GE	0.276 (0.241)	-0.158 (0.307)	0.0667 (0.185)	0.739 (0.748)	-0.311 (0.604)	0.357 (1.0966)
FDIND	0.567*** (0.188)			1.517* (0.891)		
FIIND		0.572** (0.266)			1.130** (0.526)	
FMIND			0.0930* (0.0522)			0.498 (0.377)
Constant	0.519** (0.206)	0.357 (0.233)	-0.243** (0.0912)	1.388 (0.983)	0.704 (0.440)	-1.299 (0.836)
Observation	180	180	180			
No. of groups	45	45	45			
No. of instr.	22	22	31			
AR(2) [prob]	0.147	0.129	0.223			
Hansen overid. restr. [prob]	0.947	0.763	0.680			
Sargan overid. restr. [prob]	0.657	0.898	0.944			
Dif.-in-Hansen tests of exogeneity of instr. [prob]	0.923	0.791	0.368			
Wald test for joint sig. [prob]	0.000	0.000	0.000			
Year dummy	Yes	Yes	Yes			

Note(s): Standard errors are in parentheses; EG, K, INF, Y, EXR, QII, INFR, GE, FDIND, FIIND and FMIND denote economic globalization index, capital, inflation, per capita real income, quality of institution index, infrastructure index, government expenditure, financial sector development index, financial institution index and financial market index, respectively; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source(s): Authors' estimations

and financial sector development measures are reported in [Tables A2 and A3](#) (in the Appendix), respectively. In each of the Table, both the short- and long-run results are presented and under each of them, three estimation results are reported and denoted Models 1–3 for the three measures for financial sector development: the overall financial sector development, financial institution and financial market indexes, respectively.

The paper begins discussion of the results of the impact of financial sector development on EG, TG and FG ([Tables 4 and 6](#)).

From the results, ([Tables 4 and 6](#)), it is revealed that the impact of all the financial sector development indexes are positive and significant which is consistent with the study's *a priori* expectation. Specifically, the coefficients in [Table 4](#) indicate that improvement in the financial sector development, financial institution and financial market by 1 point promote EG by 0.567

Table 5. Short- and long-run estimates of the effect of financial development on TG in Africa

Variable	Short-run results			Long-run results		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
TG _{t,t-1}	0.629*** (0.177)	0.359** (0.155)	0.338** (0.137)	—	—	—
K	0.651*** (0.207)	0.733*** (0.224)	0.816*** (0.139)	1.753** (0.772)	1.144*** (0.269)	1.234*** (0.193)
INF	0.0122 (0.0277)	0.0184 (0.0133)	−0.0143 (0.0204)	0.0328 (0.0761)	0.0287 (0.0206)	−0.0216 (0.0319)
Y	−0.0740** (0.0317)	−0.0284 (0.0340)	0.00387 (0.0174)	−0.199 (0.147)	−0.0443 (0.0578)	0.00585 (0.0261)
EXR	−0.00136* (0.000796)	−0.000802 (0.000594)	−0.000639 (0.000666)	−0.00366 (0.00233)	−0.00125 (0.000923)	−0.000966 (0.000973)
QII	−0.543 (0.572)	−0.647 (0.485)	−0.610 (0.583)	−1.463 (1.437)	−1.00978 (0.717)	−0.922 (0.894)
INFR	0.0230 (0.0153)	0.0322 (0.0209)	0.00591 (0.0117)	0.0620 (0.0476)	0.0503 (0.0309)	0.00893 (0.0177)
GE	0.558** (0.235)	0.170 (0.211)	0.416* (0.226)	1.503 (1.503)	0.265 (0.326)	0.628** (0.298)
FDIND	0.512*** (0.168)			1.379* (0.761)		
FIIND		0.415** (0.198)			0.647* (0.351)	
FMIND			0.371*** (0.112)			0.561*** (0.171)
Constant	0.332* (0.171)	0.113 (0.161)	−0.0191 (0.0992)	0.895 (0.663)	0.176 (0.270)	−0.0289 (0.150)
Observation	180	180	180			
No. of groups	45	45	45			
No. of instr	22	25	31			
AR(2) [prob]	0.385	0.835	0.264			
Hansen overid. restr. [prob]	0.699	0.530	0.445			
Sargan overid. restr. [prob]	0.560	0.110	0.161			
Dif.-in-Hansen tests of exogeneity of instr. [prob]	0.760	0.382	0.385			
Wald test for joint sig. [prob]	0.000	0.000	0.000			
Year dummy	Yes	Yes	Yes			

Note(s): Standard errors are in parentheses; TG, K, INF, Y, EXR, QII, INFR, GE, FDIND, FIIND and FMIND denote trade globalization index, capital, inflation, per capita real income, quality of institution index, infrastructure index, government expenditure, financial sector development index, financial institution index and financial market index, respectively; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source(s): Authors' estimations

(1.517), 0.572 (1.130) and 0.093 (0.498) points in the short run (long run), respectively. Similarly, the coefficients in Table 5 show that improving in financial sector development, financial institution and financial market by a point will enhance TG by 0.512 (1.379), 0.415 (0.647) and 0.371 (0.561) points in the short run (long run), respectively. Furthermore, the results in Table 6 reveal that when financial sector development, financial institution and financial market improve by 1 point, FG will be improved by 0.368 (1.448), 0.597 (2.847) and 0.031 (0.756) points in the short run (long run), respectively.

The implication of the outcome is that financial sector development as a whole (comprising both financial institutions and markets) indeed plays an important role in EG (comprising both

Table 6. Short- and long-run estimates of the effect of financial development on financial globalization in Africa

Variable	Short-run results			Long-run results		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
FG _{i,t-1}	0.746*** (0.0832)	0.790*** (0.0711)	0.959*** (0.0233)	—	—	—
K	0.404*** (0.139)	0.124 (0.171)	0.0588 (0.0426)	1.590*** (0.538)	0.594 (0.825)	1.443 (1.123)
INF	−0.00896 (0.0144)	−0.0227** (0.00884)	−0.0354*** (0.00794)	−0.0352 (0.0591)	−0.108** (0.0497)	−0.868 (0.548)
Y	−0.0515** (0.0220)	−0.0749*** (0.0208)	−0.0169*** (0.00387)	−0.203** (0.101)	−0.357*** (0.108)	−0.415 (0.305)
EXR	−0.000455 (0.000281)	0.000106 (0.000300)	0.000327*** (0.000117)	−0.00179* (0.000937)	0.000506 (0.00148)	0.00801 (0.00592)
QII	−0.000923 (0.00386)	0.00137 (0.00394)	−0.00213 (0.00202)	−0.00363 (0.0155)	0.00656 (0.0187)	−0.0522 (0.0574)
INFR	0.0307** (0.0133)	0.0282** (0.0133)	0.0225*** (0.00533)	0.121* (0.0682)	0.135** (0.0591)	0.553 (0.389)
GE	−0.129 (0.186)	−0.281 (0.203)	0.201*** (0.0518)	−0.506 (0.700)	−1.339* (0.766)	4.934* (2.663)
FDIND	0.368** (0.139)			1.448*** (0.506)		
FIIND		0.597*** (0.155)			2.847*** (0.725)	
FMIND			0.0308* (0.0169)			0.756 (0.667)
Constant	0.349** (0.136)	0.506*** (0.138)	0.126*** (0.0249)	1.374*** (0.571)	2.415*** (0.548)	3.0881 (2.0826)
Observation	180	180	180			
No. of groups	45	45	45			
No. of instr	29	29	42			
AR(2) [prob]	0.184	0.498	0.588			
Hansen overid. restr. [prob]	0.827	0.481	0.349			
Sargan overid. restr. [prob]	0.806	0.100	0.190			
Dif.-in-Hansen tests of exogeneity of instr. [prob]	0.868	0.341	0.191			
Wald test for joint sig. [prob]	0.000	0.000	0.000			
Year dummy	Yes	Yes	Yes			
Note(s): Standard errors are in parentheses; FG, K, INF, Y, EXR, QII, INFR, GE, FDIND, FIIND and FMIND denote financial globalization index, capital, inflation, per capita real income, quality of institution index, infrastructure index, government expenditure, financial sector development index, financial institution index and financial market index, respectively; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$						
Source(s): Authors' estimations						

trade and FG) in Africa in both the short- and long-run periods, especially in the latter period as the coefficients are larger than the former period. For instance, improvement in financial sector development ensures that there are diversified sources of funding and this facilitates activities of foreign direct investments, international trade, flow of financial resources, international mobility of resources, portfolio investments and easy access to credit by investors to promote investment activities. Similarly, when the financial sector is well developed, cost of lending reduces and this helps investors to have easy access to cheaper credit to support their investment plans, be it domestic or international. Also, according to [Desai et al. \(2006\)](#), development of

financial market increases the liquidity of listed companies and this eventually reduces the cost of capital for investors and this promotes EG. The positive relationship between financial sector development measures and EG is consistent with past studies (Agbloyor *et al.*, 2013; Bunje *et al.*, 2022; Islam *et al.*, 2020; Nkoa, 2018; Osabuohien *et al.*, 2017; Tsaurai and Makina, 2018) though sub-components of EG (such as FDI and trade) and sub-components of financial sector development indicators (such as domestic credit to private sector, liquid liability and bank deposit) are used as measures. This notwithstanding, this finding contradicts the study by Sare *et al.* (2019) on Economic Community of West African States (ECOWAS) countries which reports a negative relationship between financial sector development and international trade. The differences in results could be attributed to the measures of financial sector development – private credit and domestic credit – used by Sare *et al.* (2019). These indicators focus on only the financial institution aspect of the financial sector and for that matter do not capture financial sector development fully, hence the contradictory findings.

Regarding the effect of financial sector development on trade and FDI (Tables A2 and A3 in the Appendix), it is observed that the results are consistent with those reported in Tables 4–6. There is a significant positive relationship between the financial sector development measures and trade as well as FDI. It is worth noting that the long-run coefficients are much larger than those of the short run indicating that financial sector development really promotes EG measured by trade and FDI more in the long run. Similar reasons highlighted for the role of financial sector development in EG regarding the results in Tables 4–6 could be ascribed to these findings.

Turning to the control variables (see Tables 4–6 and A2 and A3), some key findings are worth mentioning. First, the significant positive coefficients of the various lagged dependent variables show the persistency of improvement in EG over time in Africa. Again, the study reveals that the EG effect of infrastructure is positive and significant in some of the estimations (see Tables 6 and A3 [in the Appendix]). This implies that improving infrastructure in the areas of fixed telephone and mobile cellular subscriptions as well as internet usage has the potential of enhancing EG as noted by Asiedu and Lien (2011), Ezeoha and Cattaneo (2012), Agbloyor *et al.* (2013), and Islam *et al.* (2020). However, a study by Nkoa (2018) reports a negative relationship between infrastructure and FDI inflows. Quality of institutions is also revealed to play a positive significant role in EG, especially in the area of FDI (Table A3 [Model 2] in the Appendix). Ensuring strong institutions gives some sort of confidence to investors, and this facilitates EG as reported by Soumare and Tchana Tchana (2015), Agbloyor *et al.* (2013) and Islam *et al.* (2020). Capital is also indicated to exert a significant positive impact on EG in most cases which is consistent with a study by Nkoa (2018). Inflation is revealed to have a negative (and significant in some cases) effect on EG, especially, in the areas of FG and FDI (see Tables 6 [Models 2 and 3] and A3 [in the Appendix]) which is consistent with findings by Agbloyor *et al.* (2013) and Bahri *et al.* (2018). Persistent inflation indicates unstable macroeconomic environment or conditions on the continent and this deters both domestic and foreign investors and discourages international or cross-border activities which in turn hampers EG. The effect of income on EG is negative and significant in some cases. For instance, it is revealed that there is a negative relationship between FG, FDI and income (Tables 6 and A3 [in the Appendix]). According to Asiedu and Lien (2011) and Ezeoha and Cattaneo (2012), higher per capita income in a particular country indicates that wages and salaries are high and also signifies expensive labor, and this does not attract FDI (which is a key component of FG) since cost of investment will be high in the host country. This therefore leads to a decline in FG.

The efficiency and reliability of our results depend greatly on the validity of the instruments as well as the absence of second order autocorrelation. From the results reported in Tables 4 and 6 and A2 and A3 (in the Appendix) (under the short-run results column), it is evident that the internally generated instruments (by the system GMM) used are valid as indicated by the probability values of the Hansen J-test. There is also not enough evidence to support the rejection of the null hypothesis which states that the estimated equations do not suffer from second order autocorrelation (AR[2]). Furthermore, the probability values of Hansen and

Sargan over identification restriction tests, the Hansen tests of the exogeneity of instruments and Wald test for joint significance show that the estimated results are reliable and therefore good for effective policy purposes.

5. Conclusions and policy implications

This paper has investigated the relationship between financial sector development and EG for a panel of 45 African countries over the period 1996 to 2019. In doing so, the two-step system generalized method of moments estimation technique is employed for the empirical analysis due to its potency in handling the issue of possible endogeneity. In measuring EG, this paper utilizes the overall EG and its two main dimensions: trade and FG indicators. Financial sector development is measured using broader measures from the International Monetary Fund, namely, financial sector development, financial institution and financial market indexes.

Both the short-run and long-run results reveal that the impact of financial sector development on EG is positive and statistically significant. The implication of this outcome is that financial sector development in a holistic point of view is a key driver of EG in Africa. It is also revealed that infrastructure is important determinant of EG in Africa.

The outcome of this paper has policy implications for African countries. First, there is the need for leaders of Africa and particularly those in the financial sector to continue developing the financial sector holistically in terms of financial institutions and markets. Specifically, players in the financial sector should continue pursuing strategies and policies especially in the areas of Internet or online systems for banking and non-banking financial institutions (such as commercial banks, investment banks, pension funds and mutual funds), debit and credit cards issuance and usage, mobile cellular banking system and automated teller machines usage among others, aimed at improving the access, efficiency and depth of the financial sector as a whole. There is also the need to ensure trusted legal and regulatory systems within the financial sector. For instance, there is the need to ensure that both banking and non-banking financial institutions operate within a clear legal and regulatory environment. This will boost the confidence level of individuals which will in turn ensure the sustainability and stability of these institutions. In addition, in the case of the non-banking financial institutions, there is the need to promote financial technology (Fintech) solutions to encourage the adoption of financial technology innovations to improve efficiency and reduce cost of financial services. The non-banking financial institutions could also invest in digital infrastructure such as mobile network and broadband Internet to support the delivery of financial services. Furthermore, government could support the activities of the non-banking financial institutions through the provision of tax incentives and subsidies. Improvement in these areas is likely to enhance the financial sector development on the continent and eventually EG. There is also the need for leadership in Africa to improve on the infrastructure within the continent. Precisely, given that, EG is likely to be enhanced by various means of wireless communication as indicated by this current study, improvement in infrastructure in the areas of fixed telephone subscription, mobile cellular subscription and Internet usage should be an area of concern moving forward.

This study, however, is not without limitations, as is the case with many other studies. For instance, differences in economic conditions, environment and resource endowment among African countries could impact study outcomes differently. This present study however did not focus on these differences in the analysis. As a result, this study suggests that future studies could consider some of these differences (such as countries with natural resources like oil and those without oil and different income groups [for example, lower-middle and higher-middle income countries]). Furthermore, different trade agreements and policies among African countries could be explored as these are likely to have influence on EG. This notwithstanding, the outcome of this present study is reliable and robust considering the various diagnostic tests performed, and hence, these limitations do not invalidate the present findings.

Notes

1. The reason for the choice of trade openness and foreign direct investment is that they are not just the ones commonly used in literature but they have greater weight/points compared with other components in the trade and financial globalization indexes. Out of the total weight of 50 points each for the sub-components under trade and financial globalization indexes, trade in goods, services and foreign direct investment have 38.5, 45.1 and 27.3 points respectively.
2. The PCA is a technique used for forming new variables that are linear composites of the original ones.

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Supplementary material

The supplementary material for this article can be found online.

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