FINANCIAL REFORM AND TRADE LIBERALIZATION IN SUB-SAHARAN AFRICAN COUNTRIES:

Which is the Leading Indicator?

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ABSTRACT

This paper examined the causal relationship between trade openness, financial reform and economic growth in 17 African countries for the 2000-2018 period. The panel vector error correction model was used to explain the direction of causality among the variables while the panel fully modified OLS (FMOLS) method was used to investigate the long-run elasticities among the policy variables. The study found unidirectional causality from economic growth to trade openness in the pooled Africa sample and East Africa, while feedback causality was observed for West Africa, North Africa and South Africa. Unidirectional causality was seen to exist from financial reform to economic growth in Africa while bidirectional causality was found for the Southern Africa region. The study found bidirectional causality between financial reform and trade openness in West Africa and unidirectional causality from trade openness to financial reform in East Africa and South Africa. Panel FMOLS estimates indicate a positive impact of financial reform and trade openness on economic growth in the pooled Africa sample. The results obtained show that trade liberalization policy led financial reform policy in 3 out of the 4 African regions studied, suggesting directional sequence between both policy thrust in the process of attaining economic growth.

Keywords: Financial liberalization, Trade openness, Growth-induced trade, Africa

JEL classification: E61, F13, F15, N37

1. Introduction

There is overwhelming evidence in both theoretical and empirical literature that finance and trade regimes have profound bearing on the economic growth trajectory in advanced and developing economies (McKinnon, 1973; Shaw, 1973; Gibson and Tsakalotos 1994; Ikhide and Alawode, 2001; Deidda and Fattouh, 2002; Schmidt-Hebbel and Serven, 2002; Obamuyi, 2009; Beck, 2011; Owusu and Odhiambo, 2014). The transfer of knowledge and technology through importation of products that are high-tech has further enhanced the relationship between international trade and economic growth (Almeida and Fernandes, 2008). This is the reason why countries that liberalize trade tend to experience faster economic growth, innovation and improved productivity. Thus, different countries in Africa have embraced economic regionalism in order to meet the challenges of the emerging world economic order. Regional integration is believed to drive economic growth, industrialization and sustainable development, which was a major factor considered in adopting the African Continental Free Trade Area (AfCFTA) arrangement due to its many implied benefits for engaging nations. An open economy, for example, reduces the cost of doing business by offering opportunities for economies of scale and, with appropriate sequencing of economic reforms, would lead to improved firm efficiency through diffusion of advanced technologies and efficiency in the allocation of resources (Coe and Helpman, 1995; Marelli and Signorelli, 2011; Nowbutsing, 2014; Huchet-Bourdon et al., 2017; Keho, 2017).

While the literature has copiously focused on how each policy thrust, namely financial reform and trade liberalization, affects economic growth, little attention has been drawn to the relationship between them, particularly in sub-Saharan African countries. Moreover, there is scanty evidence on which of the indicators leads, which remains a critical consideration for policy makers in sequencing structural reforms to achieve non-declining consumption for citizenry in time and space. Consequently, the broad aim of this study is to ascertain the nature of causal direction between trade liberalization and financial sector reform; with economic growth, being a target outcome, using data for selected sub-Saharan African countries within a pooled panel framework, coupled with regional countries' analysis for broader understanding. Thus, the attention of this study is to probe whether financial reforms drive trade openness or vice versa, as this direction is

expected to better explain the channels through which both policy variable thrusts influence economic growth, in furtherance to sequencing of reforms (McKinnon, 1991; Barlow and Radulescu, 2005) for a higher growth trajectory in the continent.

The study is organized as follows: following this introductory section, section 2 discusses relevant theoretical and empirical literature, while section 3 presents the methodology and empirical results, and in section 4, policy implications are discussed, followed by the conclusion in section 5.

2. Review of Related Literature

2.1 Conceptual issues

2.1.1 *The Financial Repression and Financial Liberalization Debate*

Financial repression refers to the notion that a set of government regulations, laws, and other non-market restrictions prevent the financial intermediaries of an economy from functioning at full capacity (Mckinnon, 1973; Shaw, 1973). Interest rate ceilings, liquidity ratio requirements, high bank reserve requirements, capital controls, restrictions on market entry into the financial sector, restrictions on direction of credit allocation, and government ownership of banks are some of the policies which cause financial repression (Berthelemy and Varoudekis, 1996; Abiad, et. al., 2010). These practices are common in most developing countries and are often imposed by governments to achieve some economic ends. However, these policies come under intense attack, and inadvertently distort the equilibrium interest rate structure under a competitive financial system. In consequence, real interest rates on deposit and lending become low and negative in some cases (Kitchen, 1986), which leads to the withdrawal of funds from the formal banking system. This outcome lowers credit availability to investors, with overriding negative effects on achieving desired economic outcomes (Hussain, Mohammed and Kamier, 2002).

From the mid-1980s to the 1990s, global financial bodies like the IMF and the World Bank recommended far-reaching structural reform policies for developing economies to move from being repressed financial systems that

are less competitive to systems with full-fledged financial sector liberalization.[6] The implementation of these reforms was the first attempt at liberalizing the financial sector during this period in the African continent. Ever since, financial reform has become an integral part of economic adjustment and stabilization programmes in the region. It is geared towards improving how the sector allocates resources, which involves the eradication of directed credit programmes, removal of interest rate ceilings, and reduction in reserve requirements to let the free market determine the allocation of credit, rather than the government. To Todaro and Smith (2011), financial liberalization involves eliminating various forms of government intervention in the financial market, thus allowing the effective use of the market (supply and demand) to determine the equilibrium level of interest rates. Proponents of the financial liberalization school hold that policies which maintain a positive real interest rate would encourage savings mobilization, thereby increasing the pool of credit that supports long-run investment and economic development.

Chandrasekhar (2004) identified two approaches of financial liberalization based on measures adopted – internal and external financial liberalization. Internal financial liberalization includes the removal of interest rates and credit controls, as well as entry barriers of new banks; privatization of state-owned banks; and reduction of controls over traded instruments by financial intermediaries. External financial liberalization involves capital account liberalization, which entails changing the extant exchange rate regime. Under this form of liberalization, foreign investors can invest in domestic financial instruments, either in debts or equities, while domestic investors, in turn can undertake cross-border commercial borrowing, even without government guarantee.

Meanwhile, Sauve (1999) listed opportunity for technology spill-over and increases in investment as possible benefits of liberalizing the financial sector in developing countries. However, the Neo-structuralist theory of finance and

[6] We use the term 'financial sector reform' and 'financial liberalization' interchangeably in this study. While the latter is often associated with decontrol of interest rate and credit allocation, financial reform covers broader dimensions of the financial system, including granting central banks more autonomy to conduct monetary policy, restructuring banks to restore solvency, improving financial infrastructure, especially bank supervision, as well as policies aimed at promoting openness of current and capital accounts.

growth, loosely called the Keynes-Tobin-Stiglitz hypothesis, provides theoretical evidence that some repressive policies, like the directed credit scheme and low real interest rate, could support investment and hence, help to stimulate economic activities. Some economists are increasingly paying attention to the possibility that financial sector reform could lead to undesired outcomes, like financial crisis and economic uncertainty (see Kose, Prasad and Terrones, 2003; Prasad, Rogoff, Wei and Kose, 2004; Kose, Prasad, Rogoff and Wei, 2006).

2.1.2 *Debate on Trade Liberalization versus Trade Openness*

Most researchers agree that open economies often achieve quicker pace of economic prosperity, compared to autarkical ones. The process of globalization, which gained traction in the early 1980s, enhanced the attainment of greater economic interdependence among countries as seen in the elevated flow of labour and cross-border trade in goods, as well as higher volume of international financial flows (Fischer, 2003).

Import substitution industrialization, based on protectionist theories, held sway in developing countries as a development strategy during the 20th century, which provided a limited degree of international openness. However, East Asian countries adopted export promotion policies and achieved higher growth performances, compared to Latin America and some countries in SSA that enacted import substitution strategies. This divergent outcome explains the increasing attempt by diverse researchers since the late 1970s to understudy the trade and economic performance nexus.

The concepts of trade openness and trade liberalization have been debated in extant theoretical and empirical literature due to the lack of clarity in defining the hitherto closely related, but non-identical terms. Trade openness is one measure of the extent to which a country is engaged in the global trading system and is usually measured by the ratio between the sum of exports and imports and gross domestic product (GDP). Trade liberalization covers all policy thrusts employed to raise the level of trade openness, especially the size of the traded sector of a country vis-à-vis total output. However, it has been observed that, policy measures designed to raise the

scope of trade openness may not necessarily be a result of the policy of trade liberalization.

In recent times, trade openness is closely linked and used synonymously with the concept of free trade, which is a policy by which a government does not discriminate against imports or interfere with exports by applying tariffs (to imports) or subsidies (to exports). Pritchett (1996) likened trade openness to the trade intensity of an economy. Greenaway, Morgan, and Wright (2002) and Stensnes (2006) view trade openness as the removal of barriers to foreign trade set by national governments. Krueger (1978) highlighted that trade liberalization can be achieved through the enactment of policies which reduce distortions in the export sector, such as providing subsidies to exporters or through the setting up of export guarantee schemes. This position is at variance with the opined position of Harrison (1996) that trade openness is identical with achieving indifferent neutrality between foreign exchange (FX) earnings through exports and FX savings earned from import substitution. The prevalence of this definition problem is crucial to understanding how measures of trade openness are delicately linked to economic performance.

2.2 Economic performance

The goal of macroeconomic policy is the achievement of output stabilization in the short run and diversified self-sustaining economic growth and development in the long run (Iyoha, 2004). The other goals include the attainment of price stability, equitable distribution of income, full-employment, and equilibrium in balance of payments. Economic activity is often geared to enhancing human welfare, and therefore, any meaningful indicator of performance must consciously acknowledge these goals. For this study, the economic performance indicator considered is real per capita GDP.

GDP is the most common indicator of economic performance since it measures the total market value of all finished goods and services produced in the monetized segment of the economy. A country with high national output (GDP) is considered wealthy, advanced, and growing, amongst countries with low or sometimes negative GDP growth rate. However, Jacobs and Šlaus, (2010) argued that GDP per capita, often used as a measure of national

productivity,[7] does not really account for personal consumption or the economic welfare of each household. This is because the calculation of GDP includes categories of expenditure such as military spending and general administration that are not directly related to households' income, expenditure and consumption. However, GDP remains one of the most widely employed metric by researchers to measure economic output and performance, especially due to its ready availability.

2.3 Theoretical literature

2.3.1 *Theory of Financial Reform*

The origin of the finance-growth debate can be traced to Bagehot (1873) and Schumpeter (1911). The concern was finding what role the capital market played in the Industrial Revolution. However, the concept was more fully developed by the independent studies of McKinnon (1973) and Shaw (1973), who argued that financial intermediaries improve economic development by shifting capital to entrepreneurs, mobilizing savings, facilitating transactions and managing risks. The duo showed that countries with high economic growth also have developed financial markets because higher levels of income may result in increases in savings and also improve efficiency of investments.

The Structuralist School led by Tobin (1965), Kohsaka (1984), and more recently, Aryeetey (2003) consider the influence of non-institutional finance, like money lenders and indigenous banking, ignored in the McKinnon and Shaw frameworks. The structuralists recognize the existence of informal financial markets in emerging economies, and they believe that the presence of structural bottlenecks impairs the functioning of financial systems in developing countries. They argue that high interest rates raise the cost of funds, result in short-run inflation spiral, and lower investment. The immediate implication of this is a reduction in the rate of economic growth.

[7] Stiglitz, Sen and Fitossi (2008) argued that using the size of GDP only to measure economic performance may overly exaggerate actual economic situation, more so that the economic structure of most global economies is rapidly changing.

In essence, the main contention of this school is that SSA countries could be better off with financial repression until their economies reach a stage of appreciable growth and development before financial liberalization can be fully entrenched to advantage.

Another school, loosely referred to as the Imperfect Asymmetric Information School, often associated with Jaffee and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981), examined the problem of financial development under asymmetry information and costly credit that results in credit rationing which could eventually lead to market failure. They believe that government intervention is only desirable when it removes asymmetry information and transaction costs. They concluded that in the presence of asymmetry information, the effects of finance on economic growth would produce mixed outcomes across economies, even among countries with comparable structural features.

Finance also plays a prominent role in the endogenous growth theory, through its positive impact on the levels of capital accumulation and savings (Romer, 1986; 1989) or of technological innovation (Romer, 1990). The endogenous growth theory tries to explain the link between financial development and economic growth. Levine (1997; 2005) highlights the theoretical literature on the finance-growth relationship, suggesting that better developed financial systems experience faster economic growth.

Finance in the endogenous growth models by Bencivenga and Smith (1991), Pagano (1993), and recently by Eggoh and Villieu (2014), posited that economic growth is affected positively by financial development due to improved savings of otherwise idle resources. The models suggest that financial development influences economic growth via three broad channels. First, it raises the proportion of savings channelled to investment; second, it increases the social marginal productivity of capital; and lastly, it influences the overall private savings rate.

The model developed by Diamond and Dybvig (1983) highlighted the role that banks/financial markets play as providers of funds to the deficit economic units. To this end, the risk appetite of the bank becomes a key factor that influences the quantity of domestic investment, and hence economic growth. The theory of financial liberalization came under severe attack for ignoring the role of the stock market in the process of economic

development. Grossman and Stiglitz (1980) as well as Cho (1986) noted that equity financing removes adverse selection and the moral hazard concerns often associated with conventional banking operations, thereby aiding economic growth.

2.3.2 *Theory of Trade (Openness)*

Throughout the centuries, researchers have attempted to understand factors that contribute to sources of economic growth through offering of trade theories. There are two (2) broad classifications of theories of international trade, namely the classical, country-based and the modern, firm-based. The earliest documentation of trade theory was mercantilism which was developed in the sixteenth century. This theory holds that the wealth of nations is determined by the amount of its gold and silver holdings through promoting exports and discouraging imports, and avoiding a trade deficit. Mercantilism, though one of the oldest theories of trade, is seen in the recent protectionist strategy of nations. The other classical theories include Adams Smith's absolute advantage trade theory, David Ricardo's theory of comparative advantage introduced in 1817, as well as the Heckscher-Ohlin-Samuelson trade model which evaluates trade equilibrium in a two-country framework with varying specialties and natural resources.

The growth of the multi-national company (MNC) and the rise in intra-industry trade gave rise to the firm-based theories because country-based theories did not fully address the reason for trade flows. These theories include the country similarity theory proposed in 1961 by Steffan Linder, while Raymond Vernon developed the product life cycle theory in the 1960s. The global strategic rivalry theory emerged in the 1980s and was based on the work of economists Paul Krugman and Kelvin Lancaster. Their theory focused on MNCs and their efforts to gain a competitive advantage against other global firms in their industry. Firms will encounter global competition in their industries and in order to prosper, they must develop competitive advantage. The Porter's National Competitive Advantage Theory developed by Michael Porter in 1990, states that a nation's competitiveness in an industry depends on the capacity of the industry to innovate and upgrade.

Porter listed 4 key determinants, namely local market resources and capabilities (factor conditions), local market demand conditions, local suppliers and complementary industries, and local firm characteristics.

More recently, Chenery and Bruno (1962) presented a two-gap model that draws on the role of savings gaps as a drag on the long-run economic growth path. In the model, both external and domestic savings gaps explain the poor performance of countries which decisive adjustments in broad-based economic policy thrust would help to address observed shortfalls to guarantee long-run economic growth. A three-gap model was developed by Taylor in 1994, which was a stylized structuralist model that offers an explanation of the trade policy and growth nexus. Kaldor (1970) developed an export-led growth model built on the notion of cumulative causation, and it takes into consideration the fact that exports are the main component of demand. Within the model, growth in exports can help ease balance of payments constraints by providing the needed foreign exchange for essential imports.

2.4 Empirical literature

Obstfeld (1998) and Stulz (1999) held that financial liberalization improves the functioning of the financial system, facilitates cross-country diversification, channels savings into their most productive uses beyond global boundaries, increases the availability of funds, and thus, boosts growth. Obamuyi and Olorunfemi (2011) found financial reform and interest rate liberalization to have positive and significant effect on economic growth. Chinn and Ito (2002) investigated the link between liberalizing the capital account and financial development, using panel data analysis for the 1977-1997 period. The study suggests that there is a strong positive relationship between financial development (proxied by private credit and stock market turnover) and capital controls, when institutional quality (legal and property rights) is well established. The findings were broadly similar using data for developing and emerging economies. Chinn and Ito (2005) tested whether financial account openness results in the development of the equity market. The result suggests that stock market deepens or responds positively to capital account openness. Acemoglu et al. (2006) argued that financial development

may have positive effects on technological innovative activities that favourably encourage economic growth.

Meanwhile, a majority of contributors to the endogenous growth literature, with few exceptions like Easterly (1993), believe that government intervention in the financial system distorts financial innovation, which lowers the equilibrium growth rate of the economy. King and Levine's (1993b) analysis holds that the imposition of a credit ceiling deters economic agents' investment incentives, and acts like tax on innovative activities that tend to hinder a higher economic growth trajectory. Kaminsky and Schmukler (2002) found evidence that financial reform leads, on average, to more output volatility, and subsequently to financial instability, which may cause aggregate output (and growth) to decline (Burkett and Dutt, 1991). Obadan (2006) explains how weak or poorly regulated financial institutions can make a country highly vulnerable to financial crisis. Bayoumi (1993), using UK data from 1971 to 1988, observed an inverse relationship between financial liberalization, which involves the relaxation of credit constraints, and savings pattern in the banking system. The study posits that by removing constraints to borrowing, economic agents increase consumption rate, rather than savings, which negatively affects the pace of financial development and economic growth.

The IMF (2008) contends that domestic financial sector liberalization enhances the way in which economies respond to various real and financial shocks. This is because policies of financial sector reforms help to reduce output costs resulting from adverse terms of trade and foreign interest rate shocks. The improvement in credit availability induced by financial reform initiatives becomes a key stabilizing vehicle for the entire economy. Allen and Gale (1997) further asserted that liberalizing the financial system improves the resilience of the economy to real shocks because reforms strengthen the link between the real and financial sectors. This is due to evidence indicating that finance is a binding constraint to firm growth, even for new firms that rely on external sources of finance (Beck, Demirguc-Kunt, and Maksimovic, 2005).

The relationship between trade liberalization and GDP growth remains a topical focus, both in theoretical and policy contexts. This may be due to the rising spate of agreements on cross-border trade integration to foster economic growth amongst participating countries. Sala-i-Martin (1997) found positive relationship between trade openness and economic growth, and is closely in line with Hoeffler's (2002) view in economic theory that greater intensity of competition emanating from trade openness would lead to higher level of economic performance among nations.

Alege and Ogun (2005) found that openness to trade raises the level of technological innovations on aggregate manufacturing production in Nigeria. Grabowski and Shields' (1996), Idowu's (2005), and Osabuohien's (2007) findings give credence to the notion that the outward-growth strategy (trade openness) is crucial for economic growth as witnessed by the economic performance successes of most Asian economies (Asian Tigers). Dollar (1992) argued that trade openness, through factor and technology flows, is a crucial source of growth.

Meanwhile, Bagwhati (1958) believes that immiserizing growth is a key outcome of deteriorating terms of trade which exceeds the favourable effect on welfare arising from economic growth at constant relative product prices. In essence, amidst distortions, trade openness leads to immiserizing growth, and so, results in a fall in welfare.

Furthermore, a study by the IMF (2008), pointed out that the ideal sequence of events is for the domestic financial sector to be liberalized first before embarking on external (capital) account openness, suggesting that trade should be liberalized before the domestic financial sector. This is because regulated interest rates, amidst other financial system distortions, will destabilize capital mobility. McKinnon (1973) hinted that capital inflows could lead to over-borrowing in foreign currency, which a dysfunctional domestic financial sector would misallocate, while capital outflows would likely erode the domestic deposit base. There is evidence that capital account liberalization may increase volatility and crisis risk in the absence of a sufficiently liberalized domestic financial sector (IMF, 2007). Such volatility could lead to inefficient allocation of resources, which may adversely affect the economic growth trajectory. In sum, the study conducted by the IMF in 2007 revealed that economic growth is higher, on average, when the domestic

financial system is liberalized before engaging in capital account openness, than when the reverse strategy is adopted.

Most countries in SSA did open their economies to international trade, as part of the structural reforms which included the liberalization of the financial sector. Rajan and Zingales (2003), for example, argued that opening the economy to international trade may quicken the pace of reform of the domestic financial sector, as greater competition in product markets (through trade) would likely weaken the influence of monopolistic incumbents who may oppose financial development. In ending, financial sector reform may be an important strategy to increase the size of domestic savings channelled through the formal financial system, improve the efficiency of financial intermediation, as well as directly or indirectly enhance the resilience of the macroeconomic environment.

3. Data, Methodology and Empirical Results

3.1 Data

This study employed annual data over the period 2000-2018 for a panel of 17 African countries and its respective sub-regional groupings, listed in Appendix A1. The countries are split into four sub-regions: West Africa, South Africa, East Africa, and Central Africa. The multivariate framework for the study include: financial reform index, trade openness, and real GDP. Trade openness and real GDP were sourced from the World Development Indicators of the World Bank, while the financial reform index was sourced from Abiad et al. (2010) financial reform database, and Folarin (2019). The database for the 18 African countries following their methodological approaches were also extended.

3.2 Financial Reform Index

In constructing the financial reform index, seven different dimensions of financial sector policy were taken into consideration, namely: credit controls and excessively high reserve requirements, interest rate controls, entry barriers, state ownership in the banking sector, capital account restrictions, prudential regulations and the supervision of the banking sector, and

securities market policy. Each of these seven (7) dimensions was assigned scores between 0 and 3 based on the level of development on the indicators in the respective countries. Unlike other previously constructed measures of financial liberalization (Williamson and Mahar, 1998; Edison and Warnock, 2003; Kaminsky and Schumkler, 2003; Laeven, 2003) which centred on the narrow view of financial sector, the financial reform index developed by Abiad et al. (2010) gave a broad-based appraisal of financial sector liberalization in each country using the 7 components of the sector.

Unlike Folarin (2019) which applied principal component analysis, the sum of all the scores for the 7 dimensions of each country was employed as financial reform index for this study, which was also the same approach employed by Abiad et al. (2010). That is, a financial reform index is obtained for each country in each year by aggregating the seven dimensions of financial reform. Since each of the seven indicators assumes a value between 0 and 3, then the aggregate sum of the seven components assumes a value between 0 and 21. Thus, the minimum financial reform index for a country in a year was 0 while the maximum score a country could take was 21.

The average financial reform indices for Africa and its sub-regional groups are plotted in Figure 1. All the sub-regions in the continent experienced liberalization during the period under review and got an average score of at least 13 out of the maximum obtainable score of 21, representing about 61.9% financial liberalization. However, the South African sub-region appeared to be the most liberalized in the financial sector among the sub-regions in the continent, while Central Africa seemed to experience the least financial reforms. Furthermore, all sub-regions altered their financial reform process during the period under review, which was characterized by fluctuations in the trend, except the Central African sub-region whose financial reform process appeared to be branded by a sustained era of stagnancy in their policies.

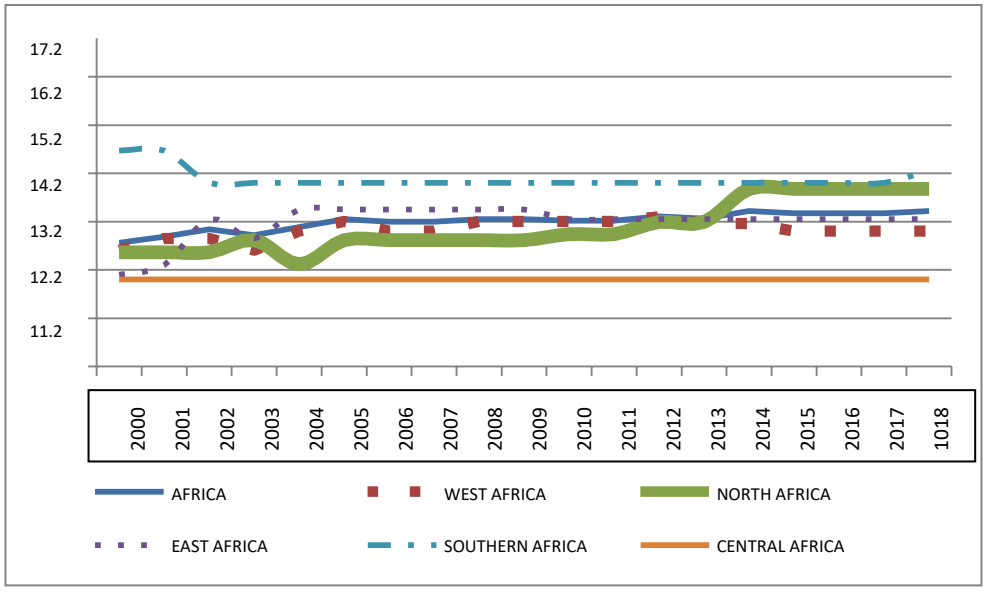

Figure 1. Financial Reform Index in Africa by Sub-regional Group, 2000-2018
Source: Authors' computations from underlying methodology of Abiad et al. (2010) & Folarin (2019).

3.3 Descriptive and correlation analysis

Table 1 presents the descriptive statistics of the variables employed in this study. The descriptive statistics of financial reform have already been explained in the previous subsection. The average real GDP for the continent, in respect of the countries under study, during the period under review was US$81.3 billion. A cursory look at the table suggests that West Africa, North Africa and Southern Africa had higher average real GDPs than the continental average. It is instructive to note that the Southern Africa sub-region had the highest mean real GDP. However, the countries with the lowest and highest real GDP are from the Southern and West African sub-region respectively. On the average, North Africa appeared to be the most open sub-region in terms of trade, compared to the other sub-regions in the continent.

The relationship between real GDP, trade openness and financial reform across Africa and its sub-regions is presented through the correlation matrix shown in table 2. There appeared to be mixed results regarding the relationship across the sub-regions. Financial reform had a significant

positive relationship with real GDP only in West Africa and Southern Africa; the other sub-regions had a negative relationship. This could result from the mixed arguments regarding the impact of financial reform on economic growth. While McKinnon (1973) and Shaw (1973) have argued strongly in favour of financial reform for growth, there has been a strong opinion from Kirkpatrick and Green (2002) that over-hasty liberalization of the financial sector can exert a disastrous effect on growth, if not sequentially carried out with other policy variables. Hence, this could justify the mixed signed effect of financial reform on different country groupings in the African continent. Trade also seemed to have a positive and significant relationship with real economic growth in Africa and some of its sub-regions like West Africa and Southern Africa. However, East Africa, North Africa and Central Africa showed a negative relationship between trade openness and economic growth.

Table 1. Descriptive Statistics

	AFR	WA	NA	EA	SA	CA
REAL GDP ($ BILLION)						
Mean	81.3	84.2	123	27.6	129	26.5
Median	30.1	22.7	117	26.6	16.4	25.3
Maximum	469	469	286	62.3	430	37.9
Minimum	5.12	5.68	29.1	7.18	5.12	17.8
Standard Deviation	112	134	69.2	14.6	168	6.22
TRADE OPENNESS (% OF GDP)						
Mean	60.07	60.84	70.87	46.53	69.91	51.15
Median	57.92	59.74	68.89	48.23	64.30	50.96
Maximum	131.98	116.04	114.35	74.35	131.98	61.97
Minimum	20.72	20.72	30.24	23.98	47.16	41.18
Standard Deviation	20.05	21.59	20.06	10.46	18.35	5.58
FINANCIAL REFORM INDEX						
Mean	14.20	14.02	14.07	14.18	15.08	13.00
Median	14.50	14.00	14.00	15.50	15.00	13.00
Maximum	19.00	18.00	17.00	17.00	19.00	13.00
Minimum	6.00	9.00	11.25	6.00	11.75	13.00
Standard Deviation	2.35	1.47	1.63	3.29	2.63	0.00

Note: AFR = Africa; WA = West Africa; NA = North Africa; EA = East Africa; SA = Southern Africa; CA = Central Africa.

Table 2. Correlation Matrix

AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	0.207***	1	
FINR	-0.341***	-0.039	1
WEST AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	0.523***	1	
FINR	0.401***	-0.421***	1
NORTH AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	-0.779***	1	
FINR	-0.094	0.125	1
EAST AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	-0.326***	1	
FINR	-0.108	0.131	1
SOUTH AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	0.399***	1	
FINR	0.851***	-0.263**	1
CENTRAL AFRICA			
	RGDP	TRADE	FINR
RGDP	1		
TRADE	-0.367	1	
FINR	-	-	1

Source: Authors' computations.

3.4 Unit root test

In order to test for the order of integration in the series of the variables employed for this study, Im et al. (IPS) (2003) unit root test was adopted. The choice of this test approach was premised on the notion that it allows for

heterogeneity by allowing the AR coefficient to vary across individual units. The result, with and without trend term, are presented in table 3. The null hypothesis of the presence of unit root for first differences of the series was rejected. Thus, all the variables were integrated of order 1, that is, I(1) across all the country groups employed in this study.

Table 3. IPS Unit Root Test Results

	Intercept Only		Intercept and Trend	
	Level	First Difference	Level	First Difference
AFRICA				
RGDP	1.84	-5.70***	2.92	-7.84***
TRADE	-1.18	-9.27***	-0.45	-7.56***
FINR	-0.53	-10.09***	-0.12	11.46***
GFC	-0.39	-5.73	1.18	-4.57***
INFL	3.51	-4.92***	1.25	-3.09***
SSEN	2.56	0.41	-0.41	-1.51*
GOVX	0.27	-5.04***	-0.56	-2.96***
WEST AFRICA				
RGDP	3.86	-2.71***	1.87	-2.87***
TRADE	0.09	-5.48***	-0.26	-4.37***
FINR	-0.57	-4.84***	1.03	-7.91***
GFC	0.49	-3.74***	1.28	-3.07***
INFL	-0.38	-2.93***	1.77	-2.79***
SSEN	2.18*	-2.67***	1.11	-2.12**
GOVX	-072	-3.28***	-0.15	-2.09**
NORTH AFRICA				
RGDP	-2.06	-0.93	1.59	-5.59***
TRADE	-0.66	-5.16***	0.09	-4.11***
FINR	-0.57	-4.84***	1.03	-7.91***
GFC	0.15	-2.29**	-0.26	-1.04
INFL	5.44	-0.62	2.44	-1.58*
SSEN	1.02	-5.18***	-0.39	-0.51
GOVX	1.30	-0.86	0.54	0.20
EAST AFRICA				
RGDP	3.10	-5.60***	-0.42	-4.91***
TRADE	-1.62*	-2.06***	0.22	-3.30***
FINR	-1.79	-6.60***	-0.82	-6.02***

	Intercept Only		Intercept and Trend	
	Level	First Difference	Level	First Difference
GFC	-0.29	-2.74***	1.05	-3.45***
INFL	1.28	-3.49***	0.60	-2.08**
SSEN	0.92	-0.74	0.94	-0.07
GOVX	-0.20	-3.73***	-0.86	-3.60***
SOUTH AFRICA				
RGDP	-3.03	-1.27	2.89	-1.76**
TRADE	0.11	-5.67***	-1.35*	-3.20***
FINR	-	-	-	-
GFC	-0.84	-1.68**	0.21	-0.73
INFL	0.07	-2.23**	-1.34*	-0.51
SSEN	-0.02	-1.44*	-1.94**	-1.30
GOVX	0.40	-1.74**	-0.41	-0.45
#CENTRAL AFRICA				
RGDP	0.33	-3.26**	-1.33	-3.19
TRADE	-1.78	-4.19***	-1.94	-3.83**
FINR	-	-	-	-
GFC	-3.98***	-5.32***	-3.75**	-5.04***
INFL	-1.39	-4.01***	-1.30	-3.99**
SSEN	0.17	0.32	-1.53	-2.08
GOVX	-1.90	-4.43***	-1.75	-4.20**

Notes: ***,** and * signify significance at 1%, 5% and 10% level respectively. RGDP= Real GDP; TRADE= Trade Openness; FINR= Financial reform index; GFC = Gross Fixed Capital Formation; *SSEN* = Secondary School Enrolment; *GOVX* = Government Expenditure.

Since Central Africa is only represented by Cameroon, the unit root test is based on the time series ADF test.

3.5 Cointegration test

Having established that all the variables were integrated of order 1, that is, they were stationary after first difference, the next step was to apply the cointegration test. The essence of this was to probe the existence of a long-run relationship among the variables. In this study, Pedroni's (1999, 2004) method of cointegration test, which allows for heterogeneity among individual panel members was employed. Pedroni (1999, 2004) proposed two categories of cointegration tests, which comprise seven individual test

statistics in all. Each of the seven test statistics allows for individual short-run dynamics, individual specific-fixed effects, individual specific slope coefficients and deterministic trends. The first category of Pedroni's test is based on the within-dimension approach, which includes panel *v* statistic, panel *rho* statistic, panel *PP*- statistic and panel *ADF* statistic. The statistics pool the autoregressive coefficients across different cross sections for the stationary tests in the estimated residual term. The second category, which is based on the between-dimension approach, averaged the individually estimated coefficients for each cross sectional member. The statistics include group *rho* statistic, group *PP*- statistic and group *ADF* statistic. The results of the Pedroni panel cointegration tests are presented in table 4. As shown in the table, most of the seven statistics significantly rejected the null hypothesis of no cointegration among the three variables for all the categories of the country groups examined in this study.

Table 4. Pedroni Panel Cointegration Test Results

Models	AFR	WA	NA	EA	SA
	Statistics	Statistics	Statistics	Statistics	Statistics
Panel v-stat	-203.69***	-323.35	-2.03	-0.32	-3.37
Panel rho-stat	2.67	1.68	1.82	0.78	-0.55
Panel pp-stat	-5.13***	-3.98***	-2.94***	-3.49***	-2.00**
Panel adf-stat	-3.14***	-2.40***	-0.22***	-3.44***	-2.00**
Panel rho-stat	3.83	2.22	2.93	1.20	-1.01
Panel pp-stat	-7.19***	-6.66***	-2.09**	-3.84***	-1.83**
Panel adf-stat	-3.87***	-3.06***	-0.06	-3.79***	-1.86**

Notes: ***,** and * signify significance at 1%, 5% and 10% level respectively. AFR= Africa; WA= West Africa; NA= North Africa; EA= East Africa; SA= Southern Africa.

3.6 Causality test

Given that the variables were stationary after first difference and were cointegrated across all the country groups, a panel-based vector error correction model (VECM) proposed by Pesaran et al. (1999) is the most appropriate model to perform causality tests. Using a two-step procedure proposed by Engle and Granger (1987), this study employed panel VECM to

investigate the presence of a long-run equilibrium relationship among the variables.

The long-run model was first implemented across the country groups as follows:

$$GDP_{it} = \alpha_i + \delta_i t + \beta_{1i} trade_{it} + \beta_{2i}\, finr_{it} + \mu_{it} \quad (1)$$

where: α and δ represent country and time fixed effects, respectively; *finr* is financial reform index; *trade* is trade openness.

The long-run residual (error correction term) was then calculated as:

$$\mu_{it} = ECT_{it} = GDP_{it} - (\alpha_i + \delta_{it} + \beta_{1i} trade_{it} + \beta_{2i}\, finr_{it})$$

The next step was to estimate the Granger-causality model with a dynamic panel-based error correction term as follows:

$$\begin{bmatrix} \Delta GDP_{it} \\ \Delta trade_{it} \\ \Delta finr_{it} \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \end{bmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \Gamma_{11k} & \Gamma_{12k} & \Gamma_{13k} \\ \Gamma_{21k} & \Gamma_{22k} & \Gamma_{23k} \\ \Gamma_{31k} & \Gamma_{32k} & \Gamma_{33k} \end{bmatrix} + \begin{bmatrix} \tau_1 \\ \tau_2 \\ \tau_3 \end{bmatrix} E\hat{C}T_{it-1} + \begin{bmatrix} \varepsilon_{1i,t} \\ \varepsilon_{2i,t} \\ \varepsilon_{3i,t} \end{bmatrix} \quad (2)$$

where:

c is vector of intercepts;

τ is vector of the speed of adjustment coefficients;

Δ is first difference operator;

ECT_{t-1} is the estimated lagged error-correction term obtained from the long-run cointegrating relationship. It shows how the speed of deviations from the long-run were connected;

Γ is matrix of the short-run coefficients; ε is vector of serially uncorrelated residuals with zero mean and finite covariance matrix.

The direction of the short-run causal relationship between the variables was determined by applying the Wald test on the short-run coefficients in equation (2). This was gotten by determining whether the coefficients in the Γ matrix were not significantly different from zero. The results of the panel

causality test between the variables in a dynamic error correction framework are presented in table 5. The Wald F-test statistics are reported as the short-run causality estimates.

According to table 5, it is evident that there was a unidirectional causality running from real GDP to trade openness, suggesting that a higher economic growth trajectory was potentially a vent for trading relationship in the African continent, while reverse causality was non-existent as trade liberalization was not related to economic growth. This finding is consistent with the neutrality hypothesis of no causal or ambiguous relationship between trade liberalization and economic growth which was found in most of the African countries investigated by Grossman and Helpman (1991), Rodrik and Rodriguez (2001), and Menyah et al. (2014). Furthermore, there was also a unidirectional causality running from financial reform to economic growth in African economies during the period under review. However, there was no causal relationship between financial reform and trade openness in the pooled African economies. Thus, no relationship existed between financial liberalization and trade liberalization in the continent. However, there was a long-run relationship among the variables, which was evident in the significance of the error correction terms in each model.

In West Africa, there was seen to be a bidirectional causality between economic growth and trade, giving credence to the possible output-induced trading relationship, as well as salutary support for the trade-led growth hypothesis in the sub-region. The plausible explanation for this two-way causal relationship is that the more trade countries engage in, the higher their income while economies with relatively higher economic growth/output would be able to demand more tradable goods and also embark on more infrastructural projects favourable for trade (Kim and Lin, 2009; Zeren and Ari, 2013). There also exists a bidirectional relationship between trade liberalization and financial liberalization among the economies in the sub-region. However, there is no causal relationship between economic growth and financial liberalization.

Table 5. Panel Causality Test from VECM Estimation

Dependent Variable	Sources of Causation (Independent Variables)			
	Short run			Long run
	ΔRGDP	ΔTRADE	ΔFINR	ECT
AFRICA				
ΔRGDP	–	3.12	4.91*	-0.08***
ΔTRADE	31.14***	–	2.46	-0.047**
ΔFINR	0.19	0.08	–	-0.006**
WEST AFRICA				
ΔRGDP	–	0.16*	0.11	-0.009**
ΔTRADE	7.67**	–	1.31*	-0.012*
ΔFINR	0.144	0.049**	–	-0.085***
NORTH AFRICA				
ΔRGDP	–	11.12***	0.54	-0.014***
ΔTRADE	1.62**	–	2.35	-0.225***
ΔFINR	1.80	0.51	–	-0.0008*
EAST AFRICA				
ΔRGDP	–	4.41	1.14	-0.009***
ΔTRADE	21.04***	–	1.07	-0.02*
ΔFINR	3.58	2.26*	–	-0.017**
SOUTH AFRICA				
ΔRGDP	–	0.072**	8.24**	-0.010***
ΔTRADE	2.56**	–	2.55	-0.001*
ΔFINR	0.097**	0.065*	–	-0.004***

Notes: ***,** and * signify significance at 1%, 5% and 10% level respectively. RGDP= Real GDP; TRADE= Trade Openness; FINR= Financial reform index

A bidirectional causality was seen to exist between economic growth and trade openness in the North African sub-region. However, in East Africa, there was unidirectional causality from economic growth to trade openness and unidirectional causality from trade openness to financial reform, suggesting that trade openness led financial reform, prompting competitive efficiency in financial institutions to benefit from resources emanating from trading firms.

Lastly, in the Southern African economies, a bi-directional causality existed between economic growth and trade openness. There was also

bidirectional causality between economic growth and financial reform. The relative advancement and depth of financial development through policies of financial liberalization in the sub-region could have accounted for these findings. The negative and statistical significance of the error correction term (ECT) in the table indicates that all the independent variables in each respective causality model bore the burden of short-run adjustment to cause long-run equilibrium. Moreover, the model passed most of the basic diagnostics, like serial autocorrelation, heteroskedasticity and normality test.

3.7 Panel fully-modified OLS (FMOLS) estimation

Since the directions of the long-run causality among the variables have been established, the last step is to estimate a long-run inter-temporal model, using panel fully-modified OLS (FMOLS). This study estimated the long-run estimates by employing the fully-modified OLS (FMOLS) model for real GDP with respect to only the entire Africa country group. The FMOLS, proposed by Pedroni (2000), controls for endogeneity problems and gives unbiased estimates of coefficients.

Following the endogenous growth model of Romer (1990), Mankiw, Romer and Weil (1992) and Barro (1999), the modified model estimated is stated in equation 3:

$$RGDPit = \alpha_0 + \beta_1 FINR_{it} + \beta_2 TRADE_{it} + \beta_3 GFC_{it} + \beta_4 INFL_{it} + \beta_5 SSEN_{it} + \beta_6 GOVX_{it} + \varepsilon_{it} \quad (3)$$

where:

RGDP = real GDP

FINR = financial reform index, a proxy to measure the extent of financial sector liberalization (Chandrasekhar, 2004; Abiad, et al., 2010)

TRADE = trade openness, a proxy for trade liberalization (Grabowski and Shields, 1996; Hoeffler, 2002; Osabuohien, 2007);

GFC = gross fixed capital formation, a proxy for domestic investment level (Sumei-Tang, Selvanathan and Selvanathan, 2008; Adams, 2009);

INFL = the log form of Consumer Price Index, a measure of inflation and proxy for macroeconomic policy environment (Ramey and Ramey, 1994; Sanchez-Robles, 1998);

SSEN = secondary school enrolment, a proxy for human capital development (Mankiw, et al., 1992; Barro 2001; Barro and Sala-i-Martin, 2004; Sachs and Warner, 1997b; Murthy and Ukpolo, 1999);

GOVX = government expenditure, a proxy for fiscal policy (Andersen and Jerry, 1968; Barro, 1988).

The estimates are presented in table 6. The results in the table indicate that all the variables had significant impact on real GDP. Gross fixed capital formation and government expenditure exerted negative impact on real GDP at 5% and 10% significance level, respectively. In addition, secondary school enrolment and inflation rate, which proxy human capital development and macroeconomic policy stability respectively, exerted positive impact on real GDP. Furthermore, financial reform and trade openness also exerted a positive impact on economic growth at 10% and 5% significance levels respectively. Although, in the short run, there was no causal relationship between trade openness and economic growth in the African model, there existed causal impact from trade openness to economic growth in the long run. This could suggest that the inclusion of trade reforms and other variables like secondary school enrolment could enhance and support the trade-led growth effect in the continent.

Table 6. Panel Fully-modified OLS Estimates for Africa, 2000-2018

Dependent Variable	Independent Variables					
	GFC	INFL	SSEN	GOVX	FINR	TRADE
RGDP	-0.014***	0.003***	0.024***	-0.005*	0.017*	0.201**
	(-11.139)	(2.960)	(42.352)	(-1.936)	(2.045)	(2.528)

Notes: ***,** and * signify significance at 1%, 5% and 10% level respectively. t-statistics values are given in parentheses

3.8 Policy implication of findings

The findings of the present study linking financial reforms and trade liberalization have thrown open some policy notes, especially for the African continent.

- First, the results show that trade openness leads financial reform, as observed in 3 out of the 4 regions studied with policy on trade openness having higher significance compared to financial reform. The regions are West Africa, East Africa and Southern Africa. This suggests that opening the economy to international trade may quicken the pace of reform of the domestic financial sector, as greater competition in product markets (through trade) would likely weaken the influence of monopolistic incumbents who may oppose financial development.
- Second, the results show that GDP caused trade openness in all the regions, as well as the pooled African series. Our suggested term for this occurrence is "growth-induced trade." The finding ascentuates the need to raise domestic output level in the continent to further provide a vent for trading relationships, which implicitly supports the staples thesis of export-led growth.
- Also, the results provide evidence that the removal of binding constraints to finance through policies of financial reform supports access to both the domestic and external capital needed for firms and economic (output) growth, and where the relationship fails to hold may be due to poor depth of financial reform or the existence of policy inconsistencies, like in West Africa.
- The lack of causality in the pooled African model indicates implied resource and finance curse, and is reflective of the binding constraint to improved welfare in the continent.

4. Conclusion

This paper investigated the causal relationship between trade openness, financial reform and economic growth in 17 African countries for the period 2000 to 2018. A panel vector error correction model was estimated and employed to probe the direction of causality between the variables in Africa and the country groupings in the continent. The panel fully-modified OLS

(FMOLS) method was further employed to probe the long-run elasticities of financial reform and trade openness on economic growth.

According to the empirical results, unidirectional causality from economic growth to trade openness in Africa and East Africa was found. However, in West Africa, North Africa and Southern Africa, economic growth and trade openness were mutually causal. There was also unidirectional causality from financial reform to economic growth in Africa while no causality existed between financial reform and economic growth in West Africa, North Africa and East Africa, although there existed bidirectional causality between the variables in Southern Africa. Furthermore, there was no causality between financial reform and trade openness in Africa and North Africa, even though causality ran from trade openness to financial reform in East Africa and Southern Africa. However, there was bidirectional causality between them in West Africa.

Furthermore, the panel FMOLS estimates indicated that financial reform and trade openness exert a positive impact on economic growth at 10% and 5% significance levels respectively in the long run in Africa, with trade openness observed to have bigger coefficient and significance. Although, there was no causal relationship between trade openness and economic growth in the African model in the short run, this could suggest that the inclusion of trade reforms and other variables like secondary school enrolments could enhance and support the trade-led growth effect in the continent. Lastly, findings of no causality between financial reform and economic growth in West Africa, North Africa and East Africa call for deep financial liberalization drives to attain desired output growth in the continent.

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Appendix A1: List of Selected African Countries

Sub-region	**Country Groupings**
West Africa	Burkina-Faso
	Côte d Ivoire
	Ghana
	Nigeria
	Senegal
North Africa	Algeria
	Egypt
	Morocco
	Tunisia
East Africa	Ethiopia
	Kenya
	Madagascar
	Tanzania
	Uganda
Southern Africa	Mozambique
	South Africa
	Zimbabwe
Central Africa	Cameroon