The Effect of Financial Development and International Trade on Deregulation

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This paper provides robust evidence of financial development and international trade liberalization on deregulation in some developing economies. Specifically, it investigates the effect of financial development and international trade liberalization on deregulation in 45 African countries in a panel set between January 1, 1980, to December 31, 2017. It employed the system Generalized Method of Moments (GMM) panel data estimation to address potential endogeneity concerns. Demir and Dahi (2011) showed that system GMM can effectively deal with any endogeneity issue originating from unobserved country-specific effects, and bias. The study found a robust positive effect of financial development and international trade liberalization on deregulation. The key finding was that technological impact is observed when private credit is regressed on market capitalization on Gross Domestic Product (GDP). It found that both GDP and gross per capita negatively impact financial development, conceivably causing the selected African countries' markets to be insulated.

Keywords: financial development, international trade liberalization, deregulation, system GMM, Africa countries

INTRODUCTION

Global economic and political activity have proven to play a pivotal part in the stability of financial development, under a wide array of economic and circumstantial factors. Financial development leads to trade openness if countries are open to the deregulation of financial markets. Knowledge management in international trade is considered an appropriate driver to internationalize a firm's business and withstand its competitive advantage (Andersson et al., 2020; Majumdar et al., 2020). International trade liberalization is supposed to promote economic growth by permitting countries to engage in technological know-how, specialize in goods for which they have a comparative advantage and to deregulate the capital market. Trade liberalization is imperative in order for countries to specialize in the production of goods for which they have a comparative advantage. The study originates its theoretical underpinning of comparative advantage in the growth of international trade. This theory was advanced by David Ricardo. According to David Ricardo, it is mutually beneficial for countries if they specialize in the production of those goods which they can produce most efficiently and import those goods that other countries produce most efficiently. Autor (2018) assessed both the David Ricardo model of trade and the Hecksher-Ohlin model of trade and noted that the David Ricardo notion is more logical and intuitively appealing than the concept underlying the Hecksher-Ohlin model, which states that trade among countries is determined by differences in factor endowments.

Despite the rich idea behind David Ricardo's notion, it failed to gain much traction in contemporary economic thinking until recently when Eaton and Kortum (2012) made David Ricardo's work intractable. By the 1960s only about twenty percent of countries were open and by 2000, over seventy per cent of countries were open due to the deregulation of financial markets. Giving further perceptivity insights on trade liberalization, Urata and Narjoko, (2017) opined that the development gap between countries at different economic phases is attainable through economic liberalization. Truly, some financial economists have backed the liberalization proposition. They are of the view that the persistence of enormous disparities between the major developed countries and developing countries can be attributed to trade liberalization.

Several studies on the relationship between financial development and international trade liberalization from the early 1990s were largely publications (Kletzer and Bardhan, 1987: Blackburn and Hung, 1998: Beck, 2002: Blackburn et al., 2005: Manova, 2008) The following empirical studies provided mixed results: Blackburn and Hung's (1998) theoretical model envisaged that both financial development and international trade liberalization increase economic growth; Kletzer and Bardhan (1987) expanded the Heckscher–Ohlin trade model by incorporating financial sector development and found that financial sector development gives countries a comparative advantage in industries that depend on external financing. Deregulation of financial markets linked with advances in technology has significantly reduced information and transaction costs. Even though many studies conclude that financial development increases international trade, many economists think that financial development leads to the development of the real sector.

With the above disagreements in the empirical studies, this study attempted to fill the gap in the literature by studying the relationship between financial development and international trade liberalization on deregulation within the African context. ln the long run, it is expected that financial development would increase the efficiency of resource allocation thus promoting product and economic development. The 1980s and 1990s saw a quick integration of international capital and financial markets. The push for globalized financial markets originally came from governments of major countries deregulating their foreign exchange and capital markets, as they had at least the capacity to affect the long-term prosperity of their citizenry.

Liberalized financial markets and intensified competition in financial services, offered a natural situation for financial innovations that resulted in the introduction of many instruments. For instance, corporations' innovative instruments played an active role in integrating the world financial markets by listing their shares across borders as well as introducing financial innovations, such as multi-currency bonds. In addition, it is believed that knowledge-intensive firms are more viable in terms of product and process innovation (Bhattacharya and Chatterjee, 2020; Mahmoud et al., 2020). Deregulation thus spread beyond the major developed economies to the developing economies and new democratic systems. Not later than the 1990s, measures of global economic integration including trade flows were back before World War I. The endogenous determination of real economic outcomes and financial institutions are prone to be influenced by trade liberalization. Deregulation aids countries with well-developed financial markets to have a comparative advantage in industries that rely relatively to a greater extent on external finance.

The paper examined the influence of financial development and international trade liberalization on deregulation and economic growth and trade openness from African countries' perspectives. It sought to establish an empirical link between financial development and international trade liberalization on deregulation and economic growth, and trade openness in developing and emerging countries' contexts particularly in African countries where less academic research has been conducted over the years. The region has experienced unprecedented overvalued exchange rates and high nominal exchange rate changeability; recorded increased volatility of real exchange rates and depreciation of the national currency, and reached high inflation and macroeconomic instability (Kyei-Mensah, 2023). Also, substantial proof of exchange rate pass-through as prices adjust (Chen and Hu, 2018) to economic reforms and overdependence on a few primary commodity exports (Ndikumana, 2015) in most developing and emerging countries.

The paper contributes to the literature in several ways by extending the financial development and international trade liberalization on deregulation for 45 African countries for the period covering 1980–2017, using the system GMM estimation method. It is intended to contribute to the existing literature by

conducting a thorough examination of the relations between financial development and international trade liberalization on deregulation economic growth and trade openness. This study differs from prior studies for several reasons. Firstly, it seeks to determine whether there is a link between financial development and international trade liberalization on deregulation and to what extent. Secondly, it explores the link between financial development and international trade liberalization on deregulations that have policy implications. To assess policy implications, it is essentially significant to investigate financial development and international trade liberalization on deregulations economic growth and trade openness in African countries.

Trade liberalization is important so that countries can specialize in the production of goods for which they have a comparative advantage which is driven by differences in productivity across countries. This comparative advantage comes from technology or skill differences among countries. The original model of international trade liberalization began with David Ricardo. David Ricardo formulated the theory of comparative advantage, in order for countries to specialize in the activities for which they are relatively more productive. Finally, it is considered that this paper is among the few addressing issues regarding financial development and international trade liberalization on deregulation economic growth and trade openness for the 45 African countries using the system GMM estimation technique.

The remainder of the paper is organized as follows**:** the second section presents the literature review. The third section describes the Generalized Method of Moments (GMM) estimation method and the dataset**.** The fourth section presents the empirical results. The concluding remarks are presented in the fifth and final section.

LITERATURE REVIEW

Analyzing the Generalized Method of Moments (GMM) estimation method of relationships in financial development is becoming increasingly fashionable (Blackburn and Hung, 1998; Beck, 2002; Blackburn et al., 2005; Apergis, et al. 2007; Demir and Dahi, 2011; Menyah et al., 2014; Akoto and Adjasi, 2020). The Blackburn and Hung (1998) and Blackburn et al. (2005) models suggested that economic growth and financial development can be harmonized to make financial deepening and real economic growth a two-way causal relationship between economic growth and financial development. The theoretical model of Beck (2002) extended this investigation by indicating that trade relationships depend on differences in financial development when both sectors count on external financing. Also, Beck (2002) predicted that one of the sectors in manufacturing develops enhancing returns to gauge whereas the food sector is characterized by constant returns to gauge. He argued further that, a comparatively high level of financial development is linked to exporting manufacturing goods whereas a comparatively low level of financial development is connected to exporting food goods. The proposition suggests that the position of financial development may significantly impact the pattern of international trade flows**.** The metamorphosis docket agenda has profoundly changed the world frugality and the position of foreign direct investment (FDI). Particularly, the accomplishments take place in the broader frame of public profitable policy, therefore being of substance to political affairs and criticisms (Motta and Ruta, 2012).

The theoretical literature also considered another function of financial development. Demir and Dahi, (2011) built on the theoretical contribution of Beck (2002) and focused on the asymmetric effects of financial development on international trade using a two-country two-sector. Thus, both the Heckscher–Ohlin model and the David Ricardo trade model predicted that countries with better financial structures will have a comparative advantage in industries in international trade. (Kletzer and Bardhan, 1987).

Many empirical contributions found that financial development affects economic growth. Apergis, et al. (2007) examined the long-run relationship between financial development and economic growth. The study found significant financial deepening and economic growth. The findings support the actuality of a single long-run equilibrium relationship between fiscal deepening and profitable growth. Trade facilitation among countries due to technology or skill differences is an essential proposition in international economics. The reason is that, as trade facilitation helps to increase trade flows (Marquez-Ramos et al., 2012; Amoako-Tuffour et al., 2016), it is probable that it promotes economic development. Bist (2018) examined a long-run relationship between financial development and economic growth and found that

financial development delegates have a significant and positive long-run effect on growth measured by credit to the private sector. Ncanywa and Mabusela's (2019) contribution was based on the influence of financial sector development on economic growth in sub-Saharan African countries using panel cointegration. They found that bank credit to the private sector and liquid liabilities would contribute positively to the development of the economy.

In their empirical contribution, Abeka et al. (2021) examined financial development and economic growth in sub-Saharan African economies for the period covering 1996 to 2017 using the system GMM estimation method. The study indicated that telecommunication infrastructure could improve the capacity of the financial sector in terms of boosting economic development. Moreover, the results indicated that building a robust telecommunication infrastructure will also have a direct influence on economic development. Manova (2008) assessed the degree of trade liberalization and found that the positive influence of equity market liberalization on firms' exports is increased when trade policy is hampered. This result is in harmony with the view that financial liberalization and trade openness reforms are institutional alternatives. The theoretical model developed by Peters and Schnitzer (2012) presumed that trade openness and financial liberalization are accompaniments. When trade between two countries is open, financial development is essential for companies in both countries to take advantage of export prospects which will lead to import competition. Demir and Dahi (2011) built on the theoretical contribution of Beck (2002) to indicate financial development and international trade, using the two-country two-sector approach. Kletzer and Bardhan (1987) argued that financial development may give rise to a comparative advantage in the financial door and a change from the very low productivity of export commodities to high productivity manufacturing goods which is the stylish occasion for investment and growth. Their finding and policy implications indicated that improving financial sector development and credit accessibility in developing countries can significantly expand the Sub–Sahara trade which has important and dynamic long-term development backing. The most important part of these theoretical contributions is the premise that the countries and the two sectors vary in their financial desires and their degree of financial dependence.

In view of the empirical implications of the theoretical arguments presented above, the study resorted to openness on trade liberalization. Dollar (1992) and Sachs and Warner (1995 supported strong positive growth effects on trade liberalization using cross-country growth compound analysis. Moreover, Edwards (1998) corroborated the robustness of his results by showing that his findings still hold grounded on his positive evaluation of colorful individual indicators of trade liberalization in cross-country growth regressions. However, Harrison (1996) and Rodriguez and Rodrik (2000) disputed the significance and robustness of the growth benefits of openness. Rodriguez and Rodrik (2000) showed how openness can be mischievous to developing countries in which trade liberalization is the policy control and market and institutional shortcomings are known as essential characteristics.

In summary, the theoretical and empirical literature review of prior studies on financial development on international trade deregulation points to the fact that it indeed increases economic growth. Several significant results were emphasized. Measures of global profitable integration including trade overflows were back before World War I. After this followed the first strong growth phase of deregulation until the 1990s. From the 1990s, deregulation grew even stronger. This caused major trade integration in transnational requests among developed economies and emerging or developing economies, a natural situation for financial innovations that redounded in the preface of numerous instruments. These findings also contributed to describing why trade has become more sensitive to trends in financial development advancement since the 1990s. Trade finance plays an important role in deciding trade performance. Kletzer and Bardhan (1987) revealed that financial sector development gives countries a comparative advantage which underpinned this study in industries that depend on external financing. This implies that countries with a well-developed financial system and a sophisticated level of external finance ought to have a comparative advantage in segments that show economies of scale.

METHODOLOGY

Variables and Sources

The study used the ratio of market capitalization (MKCAP) to the gross domestic product (GDP) (MKCAP_ GDP) as a measure of financial development (Wurgler 2000). It is estimated that big markets have more informative prices (Wurgler 2000) and financial development is smaller in developing countries.

Private credit is measured by the rate of private credit to GDP, the total credit undischarged demands of controlled financial intermediaries in a country on non-financial domestic businesses and homes, formalized by profitable exertion. In other words, private credit is the ratio of banks and non-bank financial institutions divided by the GDP multiplied by 100. Private credit is measured by using data from the World Bank database. Economic theory suggests several diverse avenues and procedures through which a sophisticated and efficient financial system can reinforce economic development.

Liquid liabilities, as a variable, consist of bank and non-bank financial institutions normally used as another way of measuring financial development. The variable is measured by resorting to the index of the proportion of current liabilities of banks and non-bank financial institutions divided by GDP multiplied by 100. A non-bank financial institution cannot issue self-drawn cheques and demand drafts. A further significant distinction between these two is that while banks involve the country's payment system, non-banking financial institutions are not part of those transactions. Beck (2002) posited that high financial development upsurges access to external finance and therefore inspires financially constrained enterprises to liberalize their financial markets and consolidate competition. Liberalized financial markets and intensified competition in financial services promote financial innovations instruments. To provide a concrete example of innovative instruments, Bhattacharya and Chatterjee, 2020; Mahmoud et al., 2020 showed that knowledge-intensive firms were more viable in terms of product and process innovation. The index is expected to positively impact financial development of market capitalization as a share of GDP (Beck, 2002). The data was sourced from the World Bank database.

Trade openness refers to the value of export and import of goods and services and scales up the total by the GDP. Openness to international trade is included as a fourth variable. Trade openness promotes financial development (Beck, 2002). Dollar (1992) and Sachs and Warner (1995) support strong positive growth effects of trade openness on trade liberalization. The indicator was taken from the World Bank database. Trade openness stimulates the effective allocation of coffers through relative advantage, permits the propagation of knowledge and technological development, and boosts competition in domestic and international trade. It is also an efficient intermediation process and enhances financial sector investment growth, improves the magnitude of domestic savings and boosts the efficiency of the financial market which would lead to economic growth. (Asongu and Odhiambo, 2019 Tchamyou, 2020).

GDP and the GDP per capita were included in the model as control variables to account for the effect of the market size and account for the level of economic development and productivity. Data was extracted from the UNCTAD database and are expressed in millions of U.S. dollars at present-day prices. Both variables were used in the models to control a transaction with their skewness (Sergio and Marzano, 2021). Bailey, 2018 and Nielsen et al., 2017 suggest that GDP and GDP per capita were included in their model to control several factors that the literature has known to influence the country's magnetism to deregulation.

David Ricardo's technology or skill is driven by differences in productivity across countries. Technology was incorporated as a third variable. Technology is computed as the gross domestic expenditure on research and development (R&D) as a percentage of GDP, where R&D "comprises creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications" (OECD, 2002: P. 30). The indicator was also taken from the World Bank database.

Tax burden was measured using data on corporation tax profit which is the amount of tax on corporate profits. Gross income minus allowable tax reliefs equals net profits of corporations. It also covers taxes levied on the capital gains of corporations. This indicator connects to the regime as a whole and is measured in percentage of GDP. The data was extracted from the World Bank database.

Inflation was measured using data on the consumer prices index. This indicated an overall rate of inflation, consistent with low, moderate, and high consumer prices index in the various economies from 1980–2017 (the essential data were logs of consumer prices index levels). There are transitory periods when the consumer prices index appears to crush out or haste up in line with weaknesses in the global economy and movement in commodity prices. The variable was extracted from the World Bank database. It is well known that when the national currency depreciates it leads to an increase in inflation. But, the level of economic instability in most African countries and variations in economic policies create cracks in formulating good policies. The study employed the one-year lag of inflation for the model to control for the dragging influence of macroeconomic instability which may alter profitable movement in the economies.

TABLE 1
VARIABLES AND SOURCES

Variable	Operationalization	Sources
Market Capitalization of GDP	(Stock of MKCAP)/GDP	World Bank
Private Credit	Ratio of private credit from banks and non-bank financial institutions divided by GDP x 100	World Bank
Liquidity Liabilities	Ratio of current liabilities of banks and non-bank financial institutions divided by GDP x 100	World Bank
Control Variables		
Trade Openness	(Import + Export) / GDP	World Bank
GDP	log (GDP)	UNCTAD
GDP per capita	log (GDP/ Population/10,000)	UNCTAD
Technology	Expenditure (R&D) / GDP	World Bank
Tax burden	Tax on income, profits and capital gains	World Bank
Inflation	Consumer prices index	World Bank

Model Specification

The Generalized Method of Moments (GMM) is a technique for constructing estimators, similar to maximum likelihood (ML). The GMM has therefore far been the most frequently employed by economists (applied class of time-varying volatility models.) The GMM makes use of propositions about particular moments of arbitrary variables rather than suppositions about the whole distribution, which makes GMM, to a lesser extent, robust than ML, at the cost of some capability. The GMM generalizes the method of moments (MM) by letting the number of moment conditions be further than the number of parameters. Exploiting these additional moment conditions makes GMM, to a lesser extent, useful than MM. When there are more moment conditions than parameters, similar as system is said to be over-identified. GMM can economically link the moment conditions when the system of an estimator is over-identified.

The ratio of market capitalization (MKCAP) to the gross domestic product (GDP) (MKCAP_ GDP) is used as a measure of financial development (Wurgler 2000). In his empirical contribution, Wurgler (2000) indicated that larger markets have significantly greater amounts of enlightening (Wurgler 2000). Significantly great amounts of enlightening expedite higher liquidity, lower transaction costs, and improve co-movement. Greater amounts of enlightening also aid in more efficient portfolio rebalancing. Furthermore, there are at times mostly large liquidity traders operating in the market.

The MKCAP_ GDP measure captures the notion that more capital markets have healthier institutions and apportion capital more effectively. The study employed the system Generalized Method of Moments (GMM) panel data estimation technique to address potential endogeneity concerns. It estimated a fixed effects model to mitigate unobservable time-invariant heterogeneity at the country level. The augmented system GMM model is stated as follows:

$$MKCAP_{GDPI,T} = \beta_0 MKCAP_{GDPi,t-1} + \beta_1 PCR_{i,t} + \beta_2 LLB_{i,t} + \beta_3 TOP_{i,t} + \beta_4 GDP_{i,t} + \beta_5 GPC_{i,t} + \beta_6 TECH_{i,t} + \beta_7 TAXB_{i,t} + \beta_8 INF_{i,t} + \varphi_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

MKCAP_GDP is a measure of financial development, defined as previously, $PCR_{i,t}$ denotes private credit which captures financial sector development, $LLB_{i.t}$ denotes liquidity liabilities which capture current liabilities of banks and non-bank financial institutions, $TOP_{i,t}$ denotes trade openness which captures import and export divided by gross domestic product, $GDP_{i,t}$ denotes gross domestic product, $GPC_{i,t}$ denotes gross domestic per capita, $TECH_{i,t}$ denotes technology captures Ricardo technology, $TAXB_{i,t}$ denotes tax burden which captures tax on income, profits, and capital gain, and $INF_{i,t}$ denotes consumer prices index, φ_i and λ_t capture country-specific effects and year fixed effects, respectively. $\varepsilon_{i,t}$ is the disturbance term assumed to be independent and identically distributed. The robust standard errors for the system GMM equation were used to diminish heteroscedasticity.

The empirical study employed the augmented "system GMM" model by Arellano and Bover (1995) and consequent generalization by Blundell and Bond (1998) and Roodman. (2009). The augmented system GMM model which has been used extensively usually involved a system of equations in the first differences and levels. The empirical study of Arellano and Bover (1995) indicated that if Arellano and Bond's (1991) first differencing estimator had used the lagged level values of variables it would be frequently deprived instruments for first differences. It therefore, suggests that if the initial equations in levels are augmented to the system additional moment conditions could be augmented to upsurge effectiveness. The instruments for the explanatory variables in the level equation are the own lagged differences, and the own lagged level variables are those for the differenced equation.

$$\Lambda MKCAP_{GDPi,t} = \beta_0 MKCAP_{i,t-1} + \Lambda\beta_1 PCR_{i,t} + \Lambda\beta_2 LLB_{1,t} + \Lambda\beta_3 TOP_{i,T} + \Lambda\beta_4 GDP_{i,t} + \Lambda\beta_5 GPC_{i,t} + \Lambda\beta_6 TECH_{i,t} + \Lambda\beta_7 TAXB_{i,t} + \Lambda\beta_8 INF_{i,t} \quad (2)$$

Bond et al. (2001) convincingly argued that with a small amount of time episodes system GMM performs better than the difference GMM. This estimator used lags of the explanatory variables as instruments to correct any latent endogeneity dispute. Blundell et al., (2001) indicated that the exogeneity of the GMM class instruments is normally a problem, the system-GMM estimator is well known for small sample properties predominantly when the series are persistent. With the use of lagged values as instruments, the study presumed that the explanatory variables were at the slightest feebly exogenous (Demir and Dahi, 2011). The model was estimated with time-fixed effects to control any country-specific time-fixed effects (Arellano and Bover, 1995). In other words, the fixed effects model was estimated to diminish unobservable time-invariant heterogeneousness at the country level. The model was estimated using a two-step estimation method with Windmeijer's (2005) finite-sample correction technique that gave asymptotically robust standard errors for the system GMM estimation. Endogeneity (Wald statistic), over-identifying restriction (J-statistic), and weak instruments (first stage robust F-statistic) were tested to indicate that models were correctly specified.

DATA SET

To conduct the analysis, the bilateral trade data from the United Nations Conference on Trade and Development database (UNCTAD) was used. Trade data from the World Bank's World Development Indicators and IMF's Direction of Trade Statistics were also obtained. Market capitalization stock to Gross Domestic Product indices were also from World Bank's World Development Indicators. The full sample spans the period January 1, 1980, to December 31, 2017. Forty-five African (developing) countries were used for the analysis and they are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon,

Central African Republic, Chad, Comoros, Congo Republic, Democratic Republic of Congo, Cote d'Ivoire, Egypt, Arab Rep, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda. Zambia and Zimbabwe. The choice of these countries reflects the availability of data and the fact that this region has been overlooked for a very long time by most academics. Annual data relative to daily or monthly data was used because daily or monthly data are generally non-existent. Again, annual data was the only alternative as the variables have annual frequency data. All the variables were transformed into natural logarithms except inflation before the econometric analysis. Table 2 presents the definitions of variables and sources used in the study.

TABLE 2
LIST OF TABLES

Country	Code	Country	Code
Algeria	DZA	Libya	LBY
Angola	AGO	Madagascar	MDG
Benin	BEN	Mali	MLI
Botswana	BWA	Mauritania	MRT
Burkina Faso	BEA	Mauritius	MUS
Burundi	BDI	Morocco	MAR
Cameroon	CRM	Mozambique	MOZ
Central African Republic	CAF	Namibia	NAM
Chat	TCD	Niger	NGR
Comoros	COM	Nigeria	NGA
Congo, Dem. Rep.	COD	Rwanda	RWA
Congo, Rep.	COG	Senegal	SEN
Cote d'lvoire	CIV	Seychelles	SYC
Egypt, Arab Rep.	EGY	Sierra Leone	SLE
Equatorial Guinea	GNQ	South Africa	ZAF
Ethiopia	ETH	Sudan	SDN
Gabon	GAB	Tanzania	TZA
Gambia, The	GMB	Togo	TGO
Ghana	GHA	Tunisia	TUN
Guinea	GIN	Uganda	UGA
Guinea-Bissau	GNB	Zambia	ZMB
Kenya	KEN	Zimbabwe	ZWE
Liberia	LBR		

EMPIRICAL RESULTS

Descriptive Statistics

Table 3 shows the summary statistics for each of the variables used in the current study. The mean log returns were satisfying for all variables and were statistically significant at 1% levels. The log return of liquid liability had the highest mean. As expected, the liquid liability had the highest standard deviation. The variables showed strong variation in the level of skewness and kurtosis, which suggests that the observations are non-normally distributed. The market capitalization, trade openness, technology, and tax burden had negative skewness, but the tax burden was insignificant. Negative skewness led to negative asymmetric effects in these countries. Kurtosis is always positive and statistically significant at 1% levels across variables. Generally, the existence of kurtosis stipulates evidence for volatility clustering and fat-tailed (Joseph et al., 2020). The jarque-bera statistics rejected the normality test at the 1% level of

significance, with the exceptions being private credit and tax burden, where the coefficients were less than 3.

TABLE 3
DESCRIPTIVE STATISTICS OF OBSERVATION

	Market Capital to GDP	Private Credit	Liquid Liability	Trade Openness	GDP	GDP per capita	Ricardian Technology	Tax burden	Inflation
Mean	2.373[a]	3.029[a]	5.811[a]	5.590[a]	2.189[a]	4.982[a]	1.027[a]	2.544[a]	3.431[a]
Median	2.432	3.030	5.598	5.488	2.213	4.953	1.047	2.552	3.368
Maximum	2.818	3.340	10.663	7.857	2.575	5.102	1.088	2.882	2.950
Minimum	1.731	2.814	5.484	4.667	1.489	4.896	0.923	2.115	2.950
Std. Dev	0.324	0.160	0.826	0.591	0.226	0.080	0.044	0.222	0.505
Skewness	-0.648[a]	0.538[a]	5.527[a]	1.708[a]	-0.966[a]	0.416[b]	-1.194[a]	-0.180	3.357[a]
Kurtosis	2.215[a]	2.313[a]	33.010[a]	7.229[a]	4.218[a]	1.448[a]	3.305[a]	2.074[a]	17.707[a]
Jarque-B.	3.633[a]	2.577	1619.422[a]	46.813[a]	8.258[a]	4.913[a]	9.170[a]	1.565	413.802
Obs.	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558	1,558

This table presents the descriptive statistics of each variable over the period January 1, 1980 to December 31, 2017. Jarque-B denotes the Jarque-Bera and Obs. Means observations. a and b denote statistical significance at the 1% and 5% level, respectively.

Correlation Matrix

Table 4 depicts the correlation matrix between dependent and independent variables. The table indicates that there is a positive and largely significant correlation coefficient between market capitalization on gross domestic product and technology, which is 0.8962. This indicates that there is a relationship between financial development and market capitalization on gross domestic product. The table shows that most variables are positively correlated and highly significant. Overall, the variables have veritable low correlation coefficients which implies that the model does not suffer from multicollinearity.

TABLE 4
CORRELATION COEFFICIENTS MATRIX

Variable	MTCAP	PCR	LLB	TOP	GDP	GPC	TECH	TAXB	INF
MKCAP	1								
PCR	0.2923***	1							
LLB	0.1845***	0.2860***	1						
TOP	0.0681**	-0.0061	-0.0448	1					
GDP	0.2540***	0.2263***	0.1758***	-0.7040***	1				
GPC	0.6856***	0.7838***	0.3900***	-0.0946**	0.4554***	1			
TECH	0.8962***	0.2056***	0.1437***	0.0312	0.3037***	0.6207***	1		
TAXB	0.8734***	0.5733***	0.2644***	-0.0240	0.3738***	0.8780***	0.8201***	1	
INF	0.5074***	0.4192***	0.1672***	0.0928**	0.3546***	0.6778***	0.5126***	0.5815***	1

Notes: The table presents Pearson correlation coefficients between the independent variables. ***, ** and * are significant at 1%, 10% and 5% respectively.

System-GMM Regression Estimates

Table 5 shows the results of the system-GMM regression estimates on the financial development of macroeconomic variables. The results indicated that endogeneity is no issue since the models are correctly specified (p-value ≥0.10). The Hansen J-statistic of the over-identifying restrictions showed that the null hypothesis that the instrument's correlations do not affect the error terms cannot be rejected. The results also showed that the model has good instruments by way of revealing the First stage F-statistic (p-value ≤0.01; Joseph et al., 2020). The lagged dependent variable enter the regression was significantly positive, this effectively assumes a system-GMM type model lends empirical support to the hypothesis that, indeed the impact of financial development on international trade deregulation cannot be estimated. Notwithstanding this approach being robust, not all chosen lag lengths are improbable to be suitable in all settings.

Focusing on the independent variables in the regression, Table 5, showed that private credit enters the regression significant positive at a 5% level on market capitalization on GDP. This indicated that improving the financial sector development and credit accessibility in developing countries can significantly expand the countries' trade which has important dynamic long-term development assistance. The result of trade openness enters the regression positive on market capitalization on GDP. Trade openness promotes financial development (Beck, 2002). Dollar (1992) and Sachs and Warner (1995) support strong positive growth effects of trade openness on trade liberalization. Financial development seemed to have negative effects on the magnitudes of GDP and GDP per capita. The estimates shown to be unaffected by the inclusion of control variables GDP and GDP per capita on market capitalizations on GDP. The coefficients of the variables GDP and GDP per capita were negative and not statistically significant.

TABLE 5
SYSTEM GMM REGRESSION ESTIMATES ON FINANCIAL DEVELOPMENT ON MACROECONOMIC MEASURES

	Model 1 Private Credit	Model 2 Liquid Liabilities
Market capitalization on GDP	1.460[a]	1.548[a]
	(0.223)	(0.210)
Private credit	0.232[b]	
	(0.235)	
Liquid liabilities		0.159[b]
		(0.011)
Trade openness	0.079	0.077
	(0.190)	(0.262)
Gross domestic product (GDP)	-0.328	-0.301
	(0.550)	(0.801)
Gross pre capital	-0.371	-0.378
	(0.430)	(0.520)
Technology	3.203[a]	3.192[a]
	(1.130)	(1.025)
Tax burden	1.037[a]	1.042[a]
	(0.210)	(0.151)
Inflation	0.028	0.010
	(0.053)	(0.022)

	Model 1 Private Credit	Model 2 Liquid Liabilities
Constant	-5.811	-26.947
	(25.299)	(16.918)
Observations	1,558	1,558
R-squared	0.873	0.872
Fixed effect	Yes	Yes
Robust	Yes	Yes
Test of Endogeneity	0.189	0.378
Hansen J-statistic	0.398	0.413
First stage, F-statistic	17.528[a]	18.678[a]

Note: a, b and c denote statistical significance at the 1%, 5% and 10% levels, respectively. Robust standard errors are in parentheses. The test for endogeneity (Wald statistic), over-identifying restriction (J-statistic) and weak instruments (first stage robust F-statistic) indicate that models are correctly specified.

As per the results, technology enters the regression statistically significant positive at a 1% level on the market capitalization on GDP indicating that a robust technology infrastructure will have a direct impact on economic development, unprecedented financial liberalization, a positive influence on equity market liberalization and that financial development may give rise to a comparative advantage in the financial door of a country. The study revealed not only the importance of this result but also found a stronger impact of financial development on technology, as shown by the larger coefficient size in the regressions. The magnitudes of the estimated coefficient from technology were higher than any variable. The tax burden in Table 5 also showed a statistically significant 1% level and the estimated coefficient was large but less than the coefficient of technology impact of financial development on socio-economic development, inferring that when the companies and citizenry pay their tax burden, it brings to bear a positive impact on economic growth. The estimated coefficients from inflation had a positive effect on financial development on international trade deregulation, implying that inflation is harmful to economic development as envisaged in these African countries, and the negative effects overshadow the positive effects.

Discussion

Private credit is seen as a major force in any sector of the economy. The term private credit means the reallocation of scarce resources to the various sectors of the economy to achieve greater efficiency. The scarce resource offered particular insights into the influence of the socio-economic activities in these African countries. In reality, the decisions of the government to rely on private credits in question were based on enormous tasks or challenges that the governments could not do alone. Therefore, an understanding of the use of private credit was necessary to understand economic development. It is notable that financial systems made credit more obtainable to allow these African countries to achieve the transformation agenda. This might indicate that private credit had a long-run impact on these African countries.

Trade openness can influence international trade thereby allowing foreign nationals to trade in the country. Trade openness promotes financial development (Beck, 2002). Empirical evidence supports that trade openness leads to economic growth. Dollar (1992) and Sachs and Warner (1995) support strong positive growth effects of trade openness on trade liberalization. Most of these African countries are rich in natural resources which was attractive to international trade. This enabled businesses to scale up their operations and provide value and insight to the business and key stakeholders.

It is expected that financial sector development would increase the efficiency of resource allocation promoting product development and economic development which had a long-run impact on these African economies. Deregulation of financial markets are linked with advances in technology, and businesses can leverage new technologies and networks to generate quality. Liberalized financial markets and intensified

competition in financial services, offered a natural situation for financial innovations. The conventional economic theory of comparative advantage has been used to justify trade between two countries. This concept supports free trade agreements, such as the African Continental Free Trade Area (ACFTA). Heckscher–Ohlin model and the Ricardo trade model predicted that those countries with more financial resources would have a comparative advantage in industries with higher external finance dependence. Their propositions claimed that financial sector development may give rise to a relative advantage in financing high-productivity commodities goods.

It is anticipated that the position of financial development would be of major interest for developing countries as those with a high position of financial resources will be able to produce high productive commodities and goods. Urata and Narjoko, (2017) gave further insights on trade liberalization and were of the view that the development gap between nations at different economic stages was attainable through economic liberalization. When companies and citizenry pay their tax obligations, the government can use that money to build infrastructural developments, like roads, hospitals, schools, and others, that enable a country to gain economic efficiency which will improve the well-being of its citizens. However, in these African countries, only a few paid taxes and this hampered financial development and for that matter economic growth. Inflation was harmful to economic development as seen in these African countries, and the negative effects overshadowed the positive effects. Poshakwale and Mandal (2017) pointed out that inflation uncertainty is an important driver of return co-movements and that it can be used to predict contagion effects.

Further Robustness Test

Further robustness tests were performed. The results were robust to the use of liquid liabilities measure of financial development. The results of Model 2 liquid liabilities in Table 5 corroborated the results of financial development on international trade deregulation. Using both indicators, the study found a robust positive effect of financial development on international trade deregulation. Indeed, consistent results were obtained when the Model 1 private credit and Model 2 liquid liabilities of Table 5 were operationalizing the variables.

CONCLUDING REMARKS

This paper explored the financial development of international trade deregulation for 45 African countries for the period covering 1980–2017, using the Generalized Method of Moments (GMM) estimation method. The estimated results from a 37-year panel with 45 African countries gave back to the predictions of the model. The results showed that both indicators have a robust positive influence on financial development on international trade deregulation. While the study found strong support for financial development on international trade deregulation, the results indicated that private credit has a long-run impact on these African countries. While private credit enters significantly positively in the regressions on market capitalization on GDP, the impact of technology on market capitalization on GDP was more than thirteen times as big as the impact of private credit on market capitalization. The result of technology indicated that technology was statistically significant and economically larger than any variable.

The main policy implication for financial sector development for these African countries lay with private credit. First, the collaboration between government and private credit was more significant and effective for various sectors of the economy to achieve greater efficiency. The financial sector development regime had favoured private credit, by supporting the business climate in countries characterized by lower levels of economic development to achieve economic growth. It was noted that technology was statistically significant and thus the need for policies seriously committed to assuring that businesses could leverage new technologies and networks that generate a quality educational system. Hence, countries with low situations of technology could follow the path of development by strengthening their technological educational systems. Therefore, the findings have significant implications for policymakers and regulators, financial managers, and international trade to affect business strategies.

This study is without limitations and provides some opportunities for future research. The research did not consider the inflow of foreign direct investment (FDI), labour supply, trade revenues, enhancing employment, and the use of an alternative model. Alternatively, future research may consider using instrumental variable-Generalized Method of Moments (IV-GMM) estimation to explore private credit, liquid liabilities, and alternative identification variables such as those not considered in this study, which will be the purpose of future research.

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