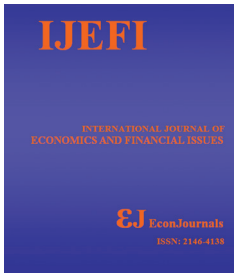

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2021, 11(1), 34-48.

Economic Growth Effects of the Interaction of Trade Openness and Institutions Quality: Empirical Evidence from Sub-Saharan Africa

Salamatu Bellah Conteh[1]*, Yuan Yijun[1], Brima Sesay[2]

[1]Faculty of Management and Economics, Dalian University of Technology, Dalian, P. R. China, [2]Wuhan University of Science and Technology, China.
*Email: bellahjamal2017@yahoo.com

Received: 15 June 2020 **Accepted:** 14 November 2020 **DOI:** https://doi.org/10.32479/ijefi.10098

ABSTRACT

In its various publications, the International Monetary Fund (IMF) has vigorously advocated the need for reforming African trade policy from inward oriented strategies to outward oriented ones. While most countries in Africa have long accepted the reform agenda, there remains marked differences in their expected growth outcomes. This raises some skepticism about the value of trade openness on growth especially in the Sub-Saharan Africa (SSA). This paper therefore investigates how trade openness impacts growth in SSA. In order to further enrich the debate around trade policy orientation and its corresponding effects on growth, we examine the interaction effect of openness and institutions quality on growth. In doing so, panel data set were collected for a sample of 27 SSA countries covering the period 1996-2016.The study employed a dynamic panel estimation technique with a view of evaluating the relative impact of the predictors on growth. The results revealed that trade openness alone bring significant negative impact on growth performance in SSA. However, the simultaneous interaction of trade openness with institutions quality brings about positive and significant impact on growth. This confirmed that positive impact of trade openness on growth is conditional on the quality of institutions. For policy, our results imply that governments in SSA should first strengthen their institutions while adopting a gradual approach to trade liberalization.

Keywords: Trade Openness, Institutions Quality, Economic Growth, Interaction, Sub-Saharan Africa
JEL Classifications: C23; C2

1. INTRODUCTION

The notion of economic growth is fundamental to economists and policy makers because of its central role in economic development. Therefore, the key factors that propel economic growth have been an area of interest for a very long time to economists and policy makers because of their significant role in the improvement of the standard of living of the populace around the world. In a broader sense, economic policy orientation is directly connected with the aims of growth, distribution and sustainability that are now recognized as overriding national objectives for countries across the globe. Trade openness/liberalization as one of the factors that has a positive effect on economic growth has also become very important as the expansion of world markets took cause within the global economy.

Countries started to eliminate restrictions on the movement of goods, services and capital with the increasing globalization after World War II. Trade liberalization contributed to increasing world trade volume and cross-border capital flows. World trade volume, as a percentage of GDP, increased from 25.62% in 1960 to about 60% in 2013 (World Bank, 2016). Furthermore, cross-border capital flows increased to about 20% of the world GDP in 2007, but then decreased to 5% of the world GDP in 2012 (James

et al., 2014). Expectedly, the liberalization of trade has been frequently advocated by the World Bank and the IMF, mostly for less developed countries as a means of improving their growth performance and more so, as a condition for granting them aids.

In recent years, however, the idea that open trade policies would help poor countries to grow faster has been intensely debated. This is particularly so as the experience of many developing countries especially in Sub-Saharan Africa tend to present contradictory evidence or scenario (see for example Menyah et al., 2014; Winters, 2014). For instance, in spite of series of economic reforms, including trade liberalization undertaken by most African countries, the pace of growth in the region remains mixed (see Greenaway et al., 2012). Here, Liberia has been an interesting case, despite it extent of openness (600% as reported by IMF), the pace of growth of the country is very low.

It is against this backdrop that this research aims to evaluate the growth experience of some selected countries in SSA with regards to their openness. Given that openness has formed a major component of policy advice especially by the IMF and the World Bank to developing countries for the last two decades, it becomes vital to investigate how openness impacts on economic growth in SSA. In order to further enrich the debate around trade policy orientation and its corresponding effects on growth, we examine the interaction effect between openness and institutions quality on economic growth that has been neglected in previous researches.

If quality of institutions complements trade openness, then we would expect a significant impact of their combined effect on growth. In view of this, the coefficient would capture the interactive effect between trade openness and institutions quality. The significance of interaction terms would imply that the marginal effect of trade openness on economic growth depends on the level of institutional quality. Following the introduction section, the rest of the paper is organized as follows. Section 2 provides a brief review of the existing literature on the subject. Section 3 presents the data issues and method of our analysis. Section 4 presents and discusses the results while Section 5 concludes with some recommendations for policy.

2. LITERATURE REVIEW

2.1. Trade Openness and Economic Growth

The significance of openness for growth and sustainable development cannot be overemphasized. Trade openness is one of the important variables of sustainable economic growth in the globalized world. Endogenous growth theories provide a theoretical basis for the relationship between trade openness and economic growth. In the context of these theories, trade openness possibly has an impact on economic growth via knowledge spillovers, capital accumulation, and factor price equalization (See Romer, 1990 and Hye and Lau, 2015).

As anticipated, the policy debate on the merits or otherwise of trade liberalization has captivated a large number of empirical researches. However, there is no broad or universal support for the arguments linking trade liberalization to growth. While some studies (Wacziarg and Welch 2008; World Bank, 2002; Manni et al., 2012; Bruckner and Lederman, 2012; Sokvi et al., 2015) have provided an affirmative support, others (e.g. Rodrik, 1999; Rodriguez and Rodrik, 2000; O'Rourke, 2000; Vlastou, 2010; Abubaker, 2015; Cavalcanti et al., 2015) maintained that opening up to trade could reduce long-term growth. Still, others (e.g. Yanikkaya, 2003; Ramanavake and Lee, 2015; Were, 2015; Zahonongo, 2017) maintained that trade liberalization does not have a simple and straightforward relationship with growth. Were (2015) maintained that, even though openness has a significant effect on growth for developed and developing countries, the effect is insignificant for LDCs which largely include African countries. Similarly, Zahonongo (2017) argued that trade threshold exists below which greater trade openness has beneficial effects on economic growth and above which the trade effect on growth declines and thus conclude that the relationship is non-linear for SSA. Extensive empirical studies have been conducted so as to determine the impact of trade openness on economic growth and they have reached mixed findings on the relationship between the two variables. Some studies, such as those by Wacziarg and Welch (2008), Marelli and Signorelli (2011), Sakyi et al. (2012), Mercan et al. (2013), Zakaria and Ahmed (2013) and Razmi and Refaei (2013), found that trade openness has a positive impact on economic growth, while some studies, such as those by Menyah et al. (2014) and Ulasan (2015), have found that trade openness has no significant impact on economic growth. On the other hand, other studies, such as those by Kim (2011) and Hye and Lau (2015), found that the relationship between trade openness and economic growth could be different depending on the level and duration of development. The study of Wacziarg and Welch (2008) further confirm that countries that liberalized their trade regimes experienced average annual growth rates that were about 1.5% points higher than before liberalization.

Recently, this issue has received additional attention. Andrews (2015) and Umesh and Pratikshva (2015) used a causality test and found that unidirectional causality runs from export to GDP. Hye and Lau (2015) employed a rolling window regression and also found that the effect of openness of the economy on growth is not stable. Vamvakidis (2002) argues that most studies find a positive relationship between openness and economic growth because the estimates rely predominantly on post-1970 data and that no such relationship can be found in earlier data.

Given the evidence that growth responses to trade liberalization differ markedly across countries, Kneller et al. (2008) investigated the sources of such heterogeneity amongst a sample of 37 liberalizing countries. To measure openness, the authors used a combination of information about the timing of trade liberalization with additional trade policy variables as well as volume measures of openness. For conditionality, they explore the effects of human capital as well as indicators of natural barriers and institutional quality. They did not found support for institutional quality. Rather, their findings show that the level of human capital and structure of trade are important factors that explain the heterogeneity in the effect of liberalization on growth rates. In particular, they found that the nature of imports is important; those liberalizers who increase imports of goods with high R&D levels experience higher growth.

In another study, Madsen (2009) focused on the influence of trade openness on economic growth and total factor productivity growth for 16 industrialized countries. Using simple regressions, the study found that economic growth, to a large extent, is independent of trade openness. The estimated coefficient of openness (measured by tariff rates and import penetration) remain mostly insignificant. However, once the interaction between openness and foreign knowledge is allowed for, growth was found to be positively affected by openness. The result reinforces the fact that openness is important for growth only when conditioned on knowledge spillovers.

2.2. Trade Openness and Institutions Quality

Openness of the economy to international trade and investment is also likely to affect evolution of a country's institutions quality. Foreign investors may create stronger demand for better institutions. The presence of multinational companies can facilitate the transfer of skills and the adoption of international business practices – which may, over time, lead to improvements in some economic institutions (see, for instance, Kovak, 2013). Dual listing of company shares contributes to improved corporate governance (see Musila and Yiheyis, 2015).

Education and training abroad may play a key role in strengthening the technical capacity of the government, civil service and state-owned companies, if they employ many of the returning scholars. This may help to design and implement technocratic economic reforms. International integration often leads to the adoption of external benchmarks that may be used to anchor reforms. A popular external benchmark is the World Bank Doing Business ranking, a well-defined and independently verifiable (even if somewhat narrow) measure of the quality of a country's business environment.

Importantly, international rankings such as the *Doing Business* report incorporate elements of yardstick competition – a comparison of economic policies and achievements in a given country with those of its neighbours or of countries with similar histories or endowments. Such yardstick competition is known to play a role in shaping economic policies.

External benchmarks go beyond international league tables. They may take the form of membership of international organisations – the World Trade Organization or the Organisation for Economic Cooperation and Development (OECD), for example. Accession often requires countries to make important adjustments to various laws and regulations, for instance in intellectual property rights protection or service sector liberalisation, and this may significantly affect a country's institutions quality and firm productivity (see Shepotylo and Vakhitov, 2012, for evidence on the impact of Ukraine's WTO accession).

Accession to regional economic blocs with strong institutions quality may provide the strongest external anchor for improving institutions. For example, the prospects of EU accession played a crucial role in supporting improvement in institutions in countries in central and south-eastern Europe (see, for instance, Schweinker et al., 2011).

More broadly, there is evidence that the quality of institutions tends to converge within regional economic blocs with deeper integration, whereby countries with weaker institutions quality catch up with countries with stronger institutions, in particular in areas such as regulatory quality, albeit slowly (see EBRD, 2012).

2.3. Institutions Quality and Economic Growth

The "institutions" quality hypothesis' contends that the institutional framework within which economic agents interact with each other in an economy affects economic development. According to this view, what matters most are the "rules of the game" in a society, which are defined by the prevailing explicit and implicit behavioural norms and their ability to create appropriate incentives for desirable economic behaviour (Rodrik and Subramanian, 2003).

The majority of early studies focused on the relationship between economic development and political institutions (Wittman, 1995; Clague et al., 1999; Scully, 1988; Wu and Davis, 1999). Over the years, however, the development of new measures has led to a number of different institutional issues being addressed in the discussion (Butkiewicz and Yanikkaya, 2006; Vukotic and Bacovic, 2006; Brunt, 2007; Kostevc et al. 2007).

Studies by Dawson (2003), Adkins and Savvides (2002), and Gwartney et al. (1996) showed that institutions that promote economic freedom have a positive effect on economic performance. In addition, a strand of the extant empirical research has scrutinized the extent to which more political freedom leads to less income inequality and to economic prosperity. Studies by Muller (1995), Li et al. (1998), Barro (1999), Bourguignon and Verdier (2000), Easterly (2001), Gradstein et al. (2001), and Sylwester (2002) among many others, report that countries with greater civil liberties have lower levels of income inequality. In time the debate on institutions moved beyond the measure of economic freedom or civil liberties and onto issues such as corruption, quality of bureaucracy, rule of law, etc., and many studies explored their impact on economic performance (Huntington, 1968; Leff, 1964; Krueger, 1974; Wei, 1999; 2000; Knack and Keefer, 1995; 2002; Svensson, 1998; Barro, 1996; Demirguc-Kunt and Detragiache,1998).

Many studies on the determinants of growth confirm the relevance of the quality and development of institutions (see, for example, Tavares and Wacziarg, 2001; Acemoglu et al. 2003; Easterly et al., 2004; Rigobon and Rodrik, 2004). In fact, in the past few years, even though we have witnessed a resurgence of research into the sources and channels through which institutions may affect the economic performance of a country or region, no clear evidence has been established (Pistor, 1995; Eweld, 1995; Weder, 1995, etc.). Even though in these studies institutions were found to be a channel through which openness can influence growth, there is a marked difference between this paper and that of previous studies as they were not testing for convergent by using the lag values of GDP growth as one of their explanatory variables. This paper made use of the initial GDP to control for convergence which can also be interpreted as the countries' stock of capital. Besides, this paper also disaggregated the components of institutions quality to compute how each one of them influences growth.

In view of the above, it seems appropriate to explore the extent to which institutional features and other macro variables are used in conventional growth analysis. Consequently, this study contributes to the existing literature and theoretical point of view as there is a limited research which disaggregated the major components of institutions quality and account for their intervening role with openness in determining economic growth in SSA countries. This study therefore aims to examine in a more holistic framework, the interactive role of institutions quality with openness as potential contributors to economic growth in SSA economies.

3. METHODOLOGY

3.1. Data and Variables

We use a panel data for a sample of 27 selected countries in Sub-Saharan Africa for the period 1996-2016. The choice of the period and countries was guided by data availability. The countries in the sample are listed in Table A in Appendix 1.

Data on Real GDP (measured in 2010 constant US$) was sourced from World Development Indicator (WDI). The dependent variable (*growth rate of real GDP*) is calculated as the percentage change in the logarithm of real GDP. Data on *Trade openness* (measured as the sum of exports and imports of goods and services as percentage of GDP) was sourced from World Development Indicator (WDI)[1]. Given the mixed results on the relationship between openness and growth in the literature, we therefore have no expected sign for that coefficient[2].

Index of human capital (*human capital*) is included as a control variable and its construction is based on secondary school enrolment rate. The data for the variable was sourced from Penn World Table (PWT) Version 9, developed by Feenstra, (2014). Another control variable is physical capital (*investment)* measured as gross fixed capital formation (% of GDP) and the data was obtained from WDI. Both human capital and physical capital are expected to be significant and positively related to growth based on traditional growth theories.

Foreign Direct Investment (measured as Net Foreign Direct Investment inflows) was included in the robustness check to verify for the robustness of the based regression model. We expect FDI to be positively related to growth. The data for FDI was sourced from WDI. Another control variable is *population growth* as a proxy of labour and *calculated* as the percentage change in the logarithm of population. The actual population values (measured in millions) were extracted from PWT, Version 9. This variable is expected to have a positive and significant impact on growth.

Institutional quality (*institutions*) is measured using five standard indicators: Control of corruption, regulatory quality, rule of law, government effectiveness and political stability and absence of violence/terrorism. Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. *Rule of law* captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Political stability and absence of violence/terrorism captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. All the institutional variables are measured using percentile rank (among 200 countries covered by the aggregate indicator) on a scale ranging from a −2.5 to 2.5. In all cases, higher rankings mean better institutions[3].

The data were sourced from Worldwide Governance Indicators (WGI) database. Table 1 is a summary of the measures of the data set used and their sources.

3.2. Motivation for Dynamic Panel Model

The dynamic panel approach offers advantages to OLS and also improves on previous efforts to examine the openness-growth nexus using pane procedures. First, using panel data, that is, pooled cross-section and time series data to make estimates allows researchers to exploit the time series nature of the relationship between openness and growth. Thus the panel approach included more information than the pure cross-country approach with positive implications on the accuracy of the coefficient estimates. Second, in a pure cross-country instrumental variable regression, any unobserved country specific effect becomes part of the error term, which may bias the coefficient estimates. Thus if there are country-specific fixed effects that are not included in the conditioning set and that help explain economic growth, then the OLS procedure may produce erroneous estimates on the openness coefficient. The panel procedure controls for country-specific effects. Third, unlike existing pure cross-country studies that use instrumental variables to control for the potential endogeneity of openness, the panel estimator controls for the potential endogeneity of *all* explanatory variables. This distinction is important. If the other growth determinants besides openness are endogenously determined with growth, which seems likely since the other growth determinants include, physical capital,

1 The World Bank, World Development Indicators, Washington D.C. The World Bank; 2017

2 A possible negation of the expected negative relation is when the imports are dominated by capital or investment goods rather than consumables, the latter of which best describes the case in the SSA region.

3 Many data sources can be used to document institutions quality. Among the main databases is the Governance matters project that started with the work of Kaufmann et al. (1999). The most recent methodology is described in Kaufman et al. (2009). The database reports six broad dimensions of governance for over 200 countries over the period 1996-2016. Five of the six dimensions are presented in table 1. The database also relies on experts' views. The six aggregate indexes are reported in standard normal units, ranging from approximately -2.5 to 2.5.

Table 1: Variable used in the study

Variable	Symbol	Measurement	Source
Real GDP per capita growth	GDP	(GDP)/Population	World Bank (2017)
Trade Openness	TOP	(Import + Export)/GDP	World Bank (2017)
Labour	L	percentage change in the logarithm of population	Penn World Table, Version 9
Foreign Direct Investment	FDI	Net Foreign Direct Investment inflows	World Development Indicators (2017)
Capital	PK/HK	Gross fixed capital formation as a proxy of physical capital(PK) and secondary school enrolment rate as a proxy for human capital(HK)	Penn World Table, Version 9
Regulatory Quality	RQ	Institutional quality variables are binary dummies variables that are coded on a -2.5 to 2.5 scales, in a bid to enhance comparability all variables were normalize to mean 0 and component variance. In all cases, higher rankings mean better institutions	World Governance Indicators (2017)
Rule of Law	RL		World Governance Indicators (2017)
Government Effectiveness	GE		World Governance Indicators (2017)
Control of Corruption	CC		World Governance Indicators (2017)
Political Stability	PS		World Governance Indicators (2017)

human capital and population growth, among others, and if the estimation procedure does not account for this endogeneity, then this could bias openness's estimated coefficient and standard error. Finally, the panel estimator that we employ accounts explicitly for the biases induced by including initial real per capita GDP in the growth regression. Since initial real per capita GDP is a component of the dependent variable, economic growth, including this variable as a regressor may bias both the coefficient estimates and their standard errors, potentially leading to erroneous conclusions. For these reasons, we augment the OLS regressions with panel estimates.

3.3. Empirical Model Specification

Following an endogenous growth framework, the study specifies a model that best captures the effect of openness (trade openness) on economic growth. Given the growing empirical evidences supporting the positive effect of trade openness on economic growth (Hye and Lau 2015; Sokvi et al., 2015) we control for other factors considered as control variables that influence long run growth and generalize the specification of a growth equation that accounts for the effects of trade openness on economic growth. Thus, in deriving our empirical model for estimating this relationship for Sub-Saharan Africa, we posit that:

$$ln(Yit) = \alpha + \beta ln(Opennessit) + \boldsymbol{\lambda} ln(Zit) + \eta i + \varepsilon it \quad (1)$$

Where $\ln(Y_{it})$ is the log of per capita GDP for country *i*, openness denotes trade openness, Z_{it} denotes vector of control variables which are labour and capital. To evaluate the effect of institutions quality on growth performance, we augment equation (1) with institutions quality variables as follows

$$ln(Yit) = \alpha + \beta\, ln(Opennessit) + \Phi ln(Institutionsit) + \boldsymbol{\lambda} ln(Zit) + \eta i + \varepsilon it \quad (2)$$

Subsequently, we sequentially introduce interaction terms between openness and institutions into equation (2). This enables us to examine if the impact of openness on economic growth is conditional on the quality of institutions. In other words, the sign and significance of the coefficient of such interaction term will reveal whether the impact of openness on growth depends on the level of institutions quality. Incorporating this, we re-write equation (2) as follows:

$$ln(Yit) = \alpha + \beta\, ln(Opennessit) + \boldsymbol{\lambda} ln(Zit) + [\gamma ln(Institutionsit) * \gamma ln(Openness)] + \eta i + \varepsilon i_t \quad (3)$$

ε is the error term; β_i measures the relative effect of openness on growth, $\boldsymbol{\lambda}_i$ denotes a set of parameters measuring the relative effect of the control variables. Equation (2) and (3) are the basis of estimating the relationship between economic growth and our measures of trade openness and institutions quality.

Following the works of Sesay et al. (2018), Vlastou (2010), Madsen (2009), and Ghani (2011) the study in addendum uses a dynamic panel technique in addressing potential problems of endogeneity in the data adopting the procedures by Arrelano and Bover (1995) and Blundell and Bond (1998).

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Preliminary Evidence

In the preliminaries, we try to ascertain whether economic growth increases or decrease as trade openness increases using scatter plots. The evidence for this is shown in Appendix 2 Figure A. The figures tend to portray a negative relationship between trade openness and growth in Sub-Saharan Africa, although the fitted line is somewhat flatter suggesting a weak relationship. Equally, we also preview, through scatter plots, the response of growth to institutional variables. Appendix 2 Figure B presents these trends. The entire results support the view that economic growth is positively related to institutional quality. The fitted values are however weak for political stability although it shows a positive trend. It can be seen from the scatter plot in Appendix 2 Figure C that when it comes to labour, human and physical capital and their relationship with growth, there is a significant positive relationship as opposed to trade openness relationship with growth in Appendix 2 Figure A.

Even though Sub-Sahara African (SSA) countries have implemented series of economic reforms, including trade liberalization, with the aim of improving on the level of their economic growth, the growth experience in the region remains weak. The theoretical motivation for these reforms is that openness/liberalization is expected to increase trade, which in turn raises the rate of economic growth. However, the empirical evidence from the large and growing literature on openness and growth remains mixed (Chaudhuri et al., 2016; Chandra et al. 2010; Claustre et al. 2010; Du 2010). Some studies suggest that openness is not associated with growth while others conclude that trade openness may even retard growth. For example, while Dollar and Kraay (2013) argue that openness helps to increase the speed of convergence; the evidence from the study

by Easterly (2008) suggests that increased openness to trade has led to income divergence rather than convergence in African countries. In fact, Rodrik (2001) argues that, regarding trade openness and growth, "the only systematic relationship is that countries dismantle trade restrictions as they get richer."

4.2. Main Results and Discussion

Prior to computing the specified growth equation, the summary statistics is presented in the first instance to give a fair description of the link between trade openness, institution quality, and economic growth for the data set collected from a panel of 27

Table 2: Summary Statistics for the overall sample of 27 SSA Countries

Variables	GDP	TOP	PK	HK	L	RQ	RL	GE	CC	PS
Mean	3.8	84.4	22.8	16.3	64.9	−0.5	−0.5	−0.6	−0.6	1.3
Maximum	232.9	531.7	219.1	97.9	87.0	1.1	1.0	1.0	1.2	1.8
Minimum	−63.2	20.0	−2.4	3.9	47.7	−2.1	−2.2	−2.0	−1.9	−2.5
Std. Dev	3.2	3.6	18.3	23.6	10.4	0.6	0.7	0.6	0.6	0.9
Correlation Matrix										
GDP	1.00									
TOP	−0.29	1.00								
PK	0.36	0.63	1.00							
HK	0.25	0.20	0.14	1.00						
L	0.15	−0.12	0.13	−0.40	1.00					
RQ	0.11	−0.21	−0.09	0.50	−0.16	1.00				
RL	0.15	−0.03	0.06	0.59	−0.14	0.08	1.00			
GE	0.11	−0.09	0.01	0.62	−0.17	0.08	0.08	1.00		
CC	0.03	−0.03	0.01	0.5	−0.15	0.09	0.05	0.06	1.00	
PS	0.23	0.13	0.23	0.4	−0.08	0.61	0.08	0.64	0.62	1.00

Table 3: Panel Estimation Results for SSA without interaction terms

Variables	Estimators							
	FE	RE	GMM-Dynamic fixed effect Model (first difference)					
	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
C	0.5729 (13.083)***	0.6930 (12.277)***						
Initial GDP			0.2065 (5.35)***	0.3120 (5.43)***	0.3419 (4.56)***	0.2965 (4.52)***	0.2421 (4.73)***	0.2763 (4.02)***
TOP	−0.1624 (6.52)*	−0.2570 (5.67)*	−0.2630 (7.24)*	−0.1829 (7.72)*	−0.1528 (8.63)*	−0.1363 (8.52)*	−0.2830 (7.98)*	−0.1744 (8.53)*
PK	0.0422 (3.43)**	0.0523 (3.05)**	0.1203 (2.63)**	0.0623 (3.42)**	0.0988 (3.76)**	0.2190 (3.63)**	0.1325 (3.81)**	0.1637 (3.53)**
HK	1.5249 (7.63)***	1.989 (6.73)***	2.4301 (8.42)***	3.3910 (9.72)***	3.6274 (7.73)***	3.5190 (7.25)***	3.0728 (8.22)***	3.241 (7.63)***
L	3.3271 (4.18)**	2.432 (1.42)	1.932 (4.34)**	2.0352 (3.78)**	0.2629 (3.63)*	1.9859 (3.75)**	1.9100 (3.45)**	2.2513 (3.43)**
RQ				0.0472 (4.39)**				
RL					0.0127 (3.42)**			
GE						0.0311 (3.53)**		
CC							0.0826 (4.95)***	
PS								0.0203 (0.98)
Observations	567	567	567	567	567	567	567	567
R^2	0.83	0.85						
F-Statistics	39.285 (0.000)***	42.485 (0.000)***						
χ^2 - Hausman test		15.083 (0.000)***						
AR(2)			Z=−5.05 (0.301)	Z=−4.95 (0.511)	Z=−4.53 (0.219)	Z=−5.32 (0.185)	Z=−4.55 (0.363)	Z=−5.32 (0.215)
χ^2 - Sargan Test			χ^2=31.03 (0.421)	χ^2=27.31 (0.539)	χ^2=25.04 (0.577)	χ^2=24.57 (0.419)	χ^2=27.63 (0.527)	χ^2=28.93 (0.483)

***, **, and * represents significant at the 1%, 5% and 10% levels respectively. The variables are expressed in log form and t–values are reported in parenthesis. The variables entering the Dynamic fixed effect model are in first difference and their coefficients are interpreted as growth elasticities. Both the fixed effects and random effects models are in levels. The dynamic model is based on the Arellano-Bond Estimation procedure. FE = fixed effects, RE = random effect.

Sub-Saharan African countries over the period 1996-2016. The summary statistics for the entire sample of SSA countries is presented in Table 2. From the summary statistics reported in Table 2, GDP growth for the entire sample of SSA countries averaged around 3.8 %. It can be seen that investment in physical capital PK averaged around 22.8% and investment in human capital HK and labour L averaged around 16.3% and 68.9% respectively. However, the extent of trade openness TOP averaged around 84.4%. For the overall sample of SSA, even though the level of political stability PS average around 1.3%, but government effectiveness stood only around −0.6%. This obviously revealed low level of government effectiveness as a component of institutional quality of the region. Regulatory quality and rule of law both averaged around −0.5% and control of corruption (CC) averaged around −0.6. This implies that for the entire sample countries of SSA, the control of corruption is low and hence the fight against corruption base to stimulate institution quality in enhancing growth is somehow not robust. Human capital development, measured as secondary school enrolment rate averaged around 16.3%, which is considered weak in the region compared to developed economies.

Unlike for openness, the pair wise correlation matrix as reported in the lower segment of Table 2 indicate positive relationship of all the independent variables with GDP growth, with physical capital (PK) measured as the gross fixed capital formation stood at (0.36), fairly strong. There is no presence of multicollnearity as the correlation among the explanatory variable are fairly low.

Following, the Arellano-Bond technique when using the Stata command "xtbond". We consider the overall sample of 27 Sub Saharan Africa countries to report the generic nature of SSA countries. The results are reported in Table 3. Given the dimension of the data, the dynamic fixed effect model estimates presented the right estimators for the analysis, the Sargan tests results as reported in the lower section of Tables 3-6 support the validity of the instruments in all of the dynamic panel regressions. Furthermore, the second order serial correlation tests reported in the lower segment in Tables 3-6 confirms no serious problem of serial correlation in the residuals from the dynamic fixed effect panel regressions. The results of the robust checks are also presented in Tables 5 and 6.

4.3. Analysis without Interaction Term

We begin our main analysis by examining the evidence based on the estimation of the baseline model with focus on the panel dynamic fixed effect model which in reality captures the relative impact of the independent variables on GDP growth. The

Table 4: Panel estimation results for SSA with interaction terms

Variables	Estimators							
	FE	RE	GMM-Dynamic fixed effect Model (first difference)					
	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
C	0.5729 (13.083)***	0.6930 (12.277)***						
Initial GDP			0.2065 (5.35)***	0.3921 (8.51)***	0.2930 (7.64)***	0.3015 (6.11)***	0.3276 (7.35)***	0.2281 (7.52)***
TOP	−0.1624 (6.52)*	−0.2570 (5.67)*	−0.2630 (7.24)*	−0.1372 (7.46)*	−0.1034 (8.32)*	−0.1641 (9.77)*	−0.2992 (8.24)*	−0.1591 (8.37)*
PK	0.0422 (3.43)**	0.0523 (3.05)**	0.1203 (2.63)**	0.0241 (3.33)**	0.0615 (4.55)**	0.0424 (5.19)**	0.0877 (4.53)**	0.0632 (5.89)**
HK	1.5249 (7.63)***	1.989 (6.73)***	2.4301 (8.42)***	2.0439 (8.99)**	2.4327 (7.63)*	3.5432 (9.04)*	3.117 (7.43)*	3.569 (8.63)*
L	3.3271 (4.18)**	2.432 (1.42)	1.932 (4.34)**	1.722 (3.95)**	0.9521 (3.08)*	1.931 (2.52)**	2.311 (5.74)**	2.0301 (8.25)*
RQ*TOP				0.0025 (3.367)**				
RL*TOP					0.0074 (3.59)**			
GE*TOP						0.0042 (2.25)**		
CC*TOP							0.0305 (4.72)***	
PS*TOP								0.0007 (0.483)
Observations	567	567	567	567	567	567	567	567
R^2	0.83	0.85						
F-Statistics	39.285 (0.000)***	42.485 (0.000)***						
χ^2-Hausman test		15.083 (0.000)***						
AR(2)			Z=−5.05 (0.271)	Z=−4.59 (0.202)	Z=−4.62 (0.419)	Z=−4.37 (0.310)	Z=−4.54 (0.336)	Z=−4.53 (0.243)
χ^2-Sargan Test			χ^2=31.03 (0.421)	χ^2=27.63 (0.712)	χ^2=29.65 (0.629)	χ^2=25.63 (0.643)	χ^2=27.95 (0.538)	χ^2=27.94 (0.630)

***, **, and * represents significant at the 1%, 5% and 10% levels respectively. The variables are expressed in log form and t–values are reported in parenthesis. The variables entering the Dynamic fixed effect model are in first difference and their coefficients are interpreted as growth elasticities. Both the fixed effects and random effects models are in levels. The dynamic model is based on the Arellano-Bond Estimation procedure. FE = fixed effects, RE = random effect.

Table 5: Robustness check of the Panel data estimate without interaction terms

Variables	Estimators							
	FE	RE	GMM-Dynamic fixed effect Model (first difference)					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
C	0.5436 (13.437)***	0.611 (11.986)***						
Initial GDP			0.1972 (5.42)***	0.2993 (5.55)***	0.3152 (4.83)***	0.3141 (4.13)***	0.2713 (4.95)***	0.2194 (4.45)***
TOP	−0.1793 (6.43)*	−0.2199 (5.57)*	−0.2519 (7.30)*	−0.1472 (7.66)*	−0.1516 (8.81)*	−0.1413 (871)*	−0.3013 (7.72)*	−0.1811 (8.74)*
PK	0.0610 (3.33)**	0.0881 (3.32)**	0.1501 (2.66)**	0.0718 (3.75)**	0.0791 (3.27)**	0.2304 (3.49)**	0.2194 (3.69)**	0.1519 (3.71)**
HK	1.7194 (7.70)***	1.8013 (6.25)***	2.4718 (8.61)***	3.3411 (9.15)***	3.6161 (8.01)***	3.7019 (7.83)***	3.1012 (8.76)***	3.2193 (7.62)***
L	3.1219 (4.41)**	2.6448 (1.53)	1.9862 (4.44)**	2.0463 (3.39)**	0.2143 (3.15)*	1.9878 (3.66)**	1.8345 (3.53)**	2.2813 (3.77)**
FDI	2.6322 (3.78)**	2.4392 (3.65)**	2.6316 (7.13)**	2.6331 (7.74)**	3.0136 (7.01)**	3.2151 (6.79)**	2.6121 (6.35)**	2.8712 (7.04)**
RQ				0.0363 (2.18)*				
RL					0.0134 (3.43)**			
GE						0.0213 (3.67)**		
CC							0.0831 (4.83)***	
PS								0.0211 (0.75)
Observations	567	567	567	567	567	567	567	567
R^2	0.86	0.87						
F-Statistics	42.419 (0.000)***	45.131 (0.000)***						
χ^2-Hausman test		17.236 (0.000)***						
AR(2)			Z=−5.34 (0.311)	Z=−5.23 (0.135)	Z=−4.56 (0.121)	Z=−4.28 (0.436)	Z=−5.42 (0.32)	Z=−5.31 (0.307)
χ^2-Sargan Test			χ^2=24.22 (0.623)	χ^2=28.51 (0.634)	χ^2=24.54 (0.549)	χ^2=23.93 (0.545)	χ^2=27.72 (0.632)	χ^2=25.53 (0.564)

***, **, and *represents significant at the 1%, 5% and 10% levels respectively. The variables are expressed in log form and t–values are reported in parenthesis. The variables entering the Dynamic fixed effect model are in first difference and their coefficients are interpreted as growth elasticities. Both the fixed effects and random effects models are in levels. The dynamic model is based on the Arellano-Bond Estimation procedure. FE = fixed effects, RE = random effect.

justification for this is that parameters estimated from both the fixed and random effects models are restricted to capturing only the level effects instead of the growth effects on GDP growth. The results are shown in Table 3. Model 3 refers to the base specification of the panel dynamic fixed effect model without any institutional variable. The result shows that trade openness is associated with negative growth in real per capita GDP.

The coefficient of trade openness is −0.2630, implying that when trade shares increases by 10%, growth rate of real income falls by 0.26%. Undoubtedly, our result does not support the hypothesis that more open economies are likely to grow faster than others. The result contradicts previous findings obtained by Musila and Yiheyis (2015), Hye and Lau (2015) and Gangton (2016) for developing countries.

Models 4-8 report the results when institutional variables were sequentially introduced into the base model. The impact of trade openness in all the estimation is generally the same. There is an overwhelming evidence of a negative and significant relationship between trade openness and economic growth. This result may not be unconnected with excessive import growth in contrast with the more modest export growth which often occur following trade liberalization in developing countries. If import growth is faster than export growth in the process of trade liberalization, it has serious negative repercussion on balance of trade and payments in the importing countries and consequently on growth performance.

With regards to the institutional quality variables, the panel dynamic fixed effect regression results reveal that the coefficients of four of the measures of institutions quality (regulatory quality, rule of law, government effectiveness and control of corruption) have positive signs and statistically significant at the 1% and 5% levels (see Table 3). It shows that improving the quality of institutions has a robust and positive impact on growth in Sub-Saharan Africa. This result is consistent with the findings by a wide range of studies on the role of institutions in enhancing growth performance (see e.g. Ghazanchyan and Stotsky 2013; Mijiyawa, 2013; Du, 2010). However, the impact of the variable (control of corruption) on growth (0.0826) is relatively higher than the other measures. This result is consistent with the conventional understanding that tackling the prevalence of corruption is

Table 6: Robustness check of the Panel data estimate with interaction terms

Variables	Estimators							
	FE	RE	GMM-Dynamic fixed effect Model (first difference)					
	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
C	0.5436 (13.437)***	0.611 (11.986)***						
Initial GDP			0.1972 (5.42)***	0.3872 (8.63)***	0.2884 (7.53)***	0.3151 (6.24)***	0.3034 (7.56)***	0.2376 (7.64)***
TOP	−0.1793 (6.43)*	−0.2199 (5.57)*	−0.2519 (7.30)*	−0.1473 (7.50)*	−0.1132 (8.04)*	−0.1545 (9.86)*	−0.2874 (8.67)*	−0.1642 (8.63)*
PK	0.0610 (3.33)**	0.0881 (3.32)**	0.1501 (2.66)**	0.0192 (3.67)**	0.0745 (4.32)**	0.0432 (5.63)**	0.0733 (4.81)**	0.0651 (5.73)**
HK	1.7194 (7.70)***	1.8013 (6.25)***	2.4718 (8.61)***	2.1728 (8.73)**	2.5363 (7.77)*	3.5350 (9.63)*	3.7635 (7.96)*	3.6373 (8.67)*
L	3.1219 (4.41)**	2.6448 (1.53)	1.9862 (4.44)**	1.6933 (3.63)**	1.0501 (3.62)*	1.8722 (2.64)**	2.6774 (5.64)**	2.0245 (8.39)*
FDI	2.6322 (3.78)**	2.4392 (3.65)**	2.6316 (7.13)**	3.7398 (3.87)**	3.7142 (3.35)**	3.7089 (4.64)**	3.6339 (3.84)**	3.6831 (3.78)**
RQ*TOP				0.0029 (3.376)*				
RL*TOP					0.0041 (3.34)**			
GE*TOP						0.0034 (2.89)**		
CC*TOP							0.0137 (4.02)***	
PS*TOP								0.031 (0.761)
Observations	567	567	567	567	567	567	567	567
R^2	0.86	0.87						
F-Statistics	42.419 (0.000)***	45.131 (0.000)***						
χ^2-Hausman test		17.236 (0.000)***						
AR(2)			Z=−5.34 (0.212)	Z=−5.45 (0.315)	Z=−5.75 (0.204)	Z=−4.45 (0.432)	Z=−5.63 (0.501)	Z=−4.62 (0.361)
χ^2-Sargan Test			χ^2=24.22 (0.623)	χ^2=24.36 (0.563)	χ^2=24.38 (0.556)	χ^2=22.56 (0.523)	χ^2=25.22 (0.536)	χ^2=27.03 (0.647)

***, **, and * represents significant at the 1%, 5% and 10% levels respectively. The variables are expressed in log form and t–values are reported in parenthesis. The variables entering the Dynamic fixed effect model are in first difference and their coefficients are interpreted as growth elasticities. Both the fixed effects and random effects models are in levels. The dynamic model is based on the Arellano-Bond Estimation procedure. FE = fixed effects, RE = random effect.

important for achieving higher economic performance, especially in the Sub-Saharan Africa region.

Turning to the control variables, the evidence in Table 3 indicates that they are generally satisfactory in their respective coefficients. In particular, the results indicate that investment in physical capital is positive and statistically significant in influencing growth as expected. This is consistent with the traditional growth theory that investment in physical capital is necessary for higher growth. Similar evidence was obtained by Ghazanchyan and Stotsky (2013).

Similarly, investment in human capital is also shown to be positive and robustly significant to growth in line with the endogenous growth theory. Taken together, the results imply that investments in both physical and human capital are crucial for economic growth. However, it is worth noting that the impact of human capital on growth (2.4301) is higher than that of investment in physical capital (which is about 0.1203), emphasizing the importance of the former over the later on growth.

Labour bears the expected positive and significant coefficient. One possible explanation for this result is that higher labour force participation rate is likely to correlates positively with GDP growth which is an important input in any growth matrix. In general, the growth of labour force enters the dynamic growth equation with a positive sign and significant at the 1% level, for the entire sample of SSA countries signifying that an increase in the labour force by 10%will induce economic growth by 1.93%.

4.4. Analysis with Interaction Term

Introducing the interaction terms (see Table 4) does not alter the results with regards to the signs and statistical significance of the control variables. Consistent with Table 3, the impact of trade openness on growth is still negative and statistically different from zero.

Interestingly, the interaction of trade openness with regulatory quality, rule of law, government effectiveness and control of corruption generates robust and positive effects on growth. This simply implies that these institutional factors are connected to the effectiveness of trade openness on growth in Sub-Saharan Africa. Practically, the result confirms that in the absence of good institutions,

trade openness alone would have significant negative impact on growth. In effect, improving the quality of institutions, especially as it relates to corruption control, quality of trade policy formulation and implementation, the credibility of government's commitment to trade policies as well as the quality of contract enforcement and protection of property rights, is important. Corruption, for instance, reduces private investment owing to higher costs and increasing uncertainty on the part of the investor. By these results, institutional quality and trade openness are complementary in the growth process of countries in Sub-San Africa. However, we observed that the impacts are generally small which might reflect the fact that the qualities of institutions in Sub-Saharan Africa are too weak.

4.5. Robustness Check for Panel Regression Estimates

In order to ascertain the relative stability of our regression estimates we carry out robustness checks by introducing new explanatory variable-foreign direct investment denoted as (FDI) in the base regressions. The exercise entails comparing the new parameters obtained by introducing a new explanatory variable in the new model to the original estimates of the base regression. The idea is to check if the parameter estimates from the new regression does not change much in terms of the signs and level of significance from those of the base regression, we therefore consider the estimates from the base regression robust. The results of the robustness checks with and without interaction terms are reported in Tables 5 and 6 respectively. The results from the robustness checks reveal that the coefficients of all the variables in our base regressions fail to vary significantly from those of the new estimates, therefore, implying that the parameter estimates from our panel regressions are robust. This confirms the appropriateness of the estimations techniques and that the model has been well specified. The R-squared values (coefficient of determination) reasonably explained the proportion by which the regression model is best fitted.

The introduction of FDI in the model shows a positive and highly statistically significant impact on economic growth in SSA. Currently, foreign direct investment (FDI) is acting a great part for economic growth in both industrialized and unindustrialized nations. The host country will benefit as FDI generates employment opportunities, encourages economic growth, and enables technology transfer (UNCTAD 2010, Agrawal and Khan 2011). Furthermore, the foreign direct investment is seen to seal the gap between national investments and savings in most SSA countries as their income and savings are low (Tang et al., 2014, Mottaleb and Kalirajan 2010). To increase the benefit most developing nations in SSA are trying to appeal FDI by edging different strategies such as trade liberalization and creating an outstanding investment environment (UNCTAD 2010). Recent drifts display that FDI can be an imperative and firm source of private capital for SSA economies, mostly economies that are able to generate a friendly environment for new foreign investments.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1. Conclusion

This final section summarizes the major findings and provides policy implications from the previous sections. The literature has explicitly or implicitly documented the role that trade liberalization could play in the development process. As a result, some scholars and international institutions like the World Bank and the IMF seem to have reached a "broad consensus" that open economies tend to grow faster than closed ones. However is this point more important than in Africa? The slow growth of African countries, especially in the early 1960s and the early 1980s, was blamed on their "restrictive" trade regimes and therefore needed to be reformed in order to speed up growth. In its various publications, the IMF has vigorously advocated the need for reforming African trade policy from inward oriented strategies to outward oriented strategies. While most countries in Africa have long accepted the reform agenda, there remains marked differences in the expected growth outcomes across countries in Africa. This raises some skepticism about the value of trade openness on growth especially in the Sub-Saharan Africa (SSA).

Given the fact that growth is weak in least developed countries, most authors and policy makers today are searching for ways to enhance growth. Openness is one of the identified sources. Hence, the links between the two, openness and economic growth have been a major area for consideration by researchers. However, findings of the current literature are mixed and inconclusive. These contradictory conclusions emerging from the empirical literature and coupled with weak growth performance of the SSA countries motivated this study.

In this study the broad objective has been to investigate the link between openness and economic growth. Specifically, the paper examines two major issues. Firstly the empirical section analyses the effect of openness on economic growth in Sub-Saharan Africa. Secondly, to further enrich the debate the empirical section investigates the interacting role of institution quality with openness on economic growth in SSA countries. The section was empirically examined using panel data framework for 27 selected countries in SSA. To avoid omitted variable bias, we controlled for core growth variables including investment in physical capital, human capital and labour. Each of these points has been provided for in the literature review and theoretical framework with detailed background understanding of trade openness, institution quality and economic growth.

OLS results based on Generalized Method of Moments system (GMM-Panel Dynamic fixed effect) estimators show that investment in physical capital, human capital and labour are important factors for growth performance in SSA. Most importantly, we found that trade openness alone have a strong negative impact on growth in SSA. Further estimations confirm that for trade openness to have a significant positive impact on growth, the qualities of domestic institutions are important. In specific, we found that the positive impact of trade openness on economic growth is conditional on the quality of institutions, especially as it relates to control of corruption, regulatory quality, rule of law, quality of trade policy formulation and implementation, the credibility of government's commitment to trade and policies as well as the quality of contract enforcement and protection of property rights.

Since the simultaneous interaction of institutions quality indicators and trade openness have significant positive effects on growth in the SSA countries, we therefore contend that the complimentary role of trade openness and institutions quality is good for growth and the policy direction is that strong institution quality may be necessary for accelerating growth in SSA.

5.2. Policy Recommendations

In light of the liberalization process of trade openness on course, policy formulation designing and implementation must be undertaken with caution. As mentioned inter-alia, wholesome implementation of the reform prescription of the IMF and World Bank can at times be self-defeating with severe consequences on society in general and the financial sector in particular. This is because trade reform policies can at times be defeated in the presence of weak institutions quality, such as high rate of corruption, government ineffectiveness and poor regulatory quality in an economy.

One clear policy implication of our results is that governments in SSA should first strengthen the quality of their domestic institutions and be mindful of the nature of their imports. Practically, attention should be paid particularly to imports of capital goods and intermediate products with high R&D concentration. Such imports would bring the knowledge upon which the long-term growth itself will be heavily dependent. But doing so requires a cautious approach to liberalization. This is because the existing realities of the structure of trade in Africa may not be beneficial to move fully to a virtually free-trade policy posture. Africa's export structure has remained largely undiversified in the last decades with significant and sustained losses in their shares in the world export markets. There is need, therefore, to first established and developed a dynamic and diversified export base in Africa before opting for more outward-oriented trade policies. A full commitment to this strategy requires further improvement in its existing institutional architecture.

The policy implications of our control variables are clear. In brief, there is need to create a conducive environment and requisite infrastructure for domestic investment to boom. Greater attention should be paid to human capital development; Not only should human capital development be taken seriously, it should be effectively utilized to discourage brain drain.

In summary, it is worthy of note that openness to trade is merely an opportunity for countries to reap the benefits of global integration, but not an automatic guarantee that these benefits would accrue to all countries. While trade reforms or liberalization may help accelerate integration in the world economy, our results show that they cannot ensure success as an effective growth strategy for developing countries. Other elements that address these binding constraints to growth are needed including improvements in the quality of institutions, economy-wide investments in human capital and infrastructure. Furthermore, setting up anti corruption institutions to help in the fight against corruption in the region is necessary for growth enhancement. The result of this study indicates that trade openness in the region can have a more positive impact on growth if institutions quality is also developed as evidenced by the positive and statistically significant impact on growth with interaction terms of trade openness and institutions quality. To this end, SSA countries should pursue policies geared toward improving institutions quality in the region.

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APPENDIXES

Appendix 1

Table A: Sample of SSA countries

No.	Country	Abbreviation	Panel data id
1	Botswana	BWA	1
2	Mauritius	MUS	2
3	Namibia	NAM	3
4	South Africa	ZAF	4
5	Gabon	GAB	5
6	Angola	AGO	6
7	Equatorial Guinea	GNQ	7
8	Cameroon	CMR	8
9	Ghana	GHA	9
10	Kenya	KEN	10
11	Cote D'Ivoire	CIV	11
12	Nigeria	NGA	12
13	Swaziland	SWZ	13
14	Zambia	ZMB	14
15	Cape Verde	CPV	15
16	Lesotho	LSO	16
17	Congo. Rep.	COD	17
18	Sierra Leone	SLE	18
19	Guinea	SLE	19
20	Liberia	GIN	20
21	Burundi	LBR	21
22	Burkina Faso	BDI	22
23	Benin	BFA	23
24	Gambia	BEN	24
25	Malawi	GMB	25
26	Rwanda	MWI	26
27	Mali	RWA	27

Appendix 2

Figure A: trade openness and economic growth

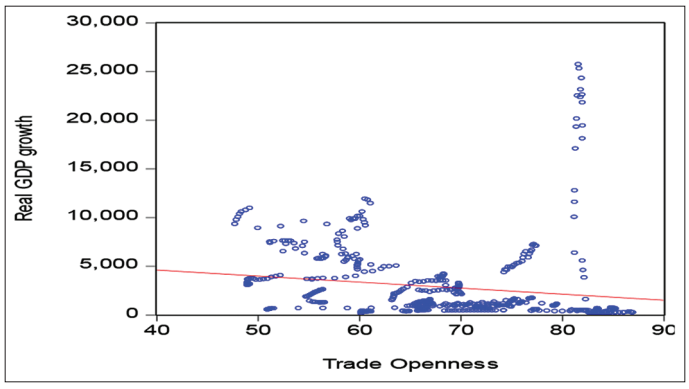

Figure B: Institutions quality and economic growth in SSA

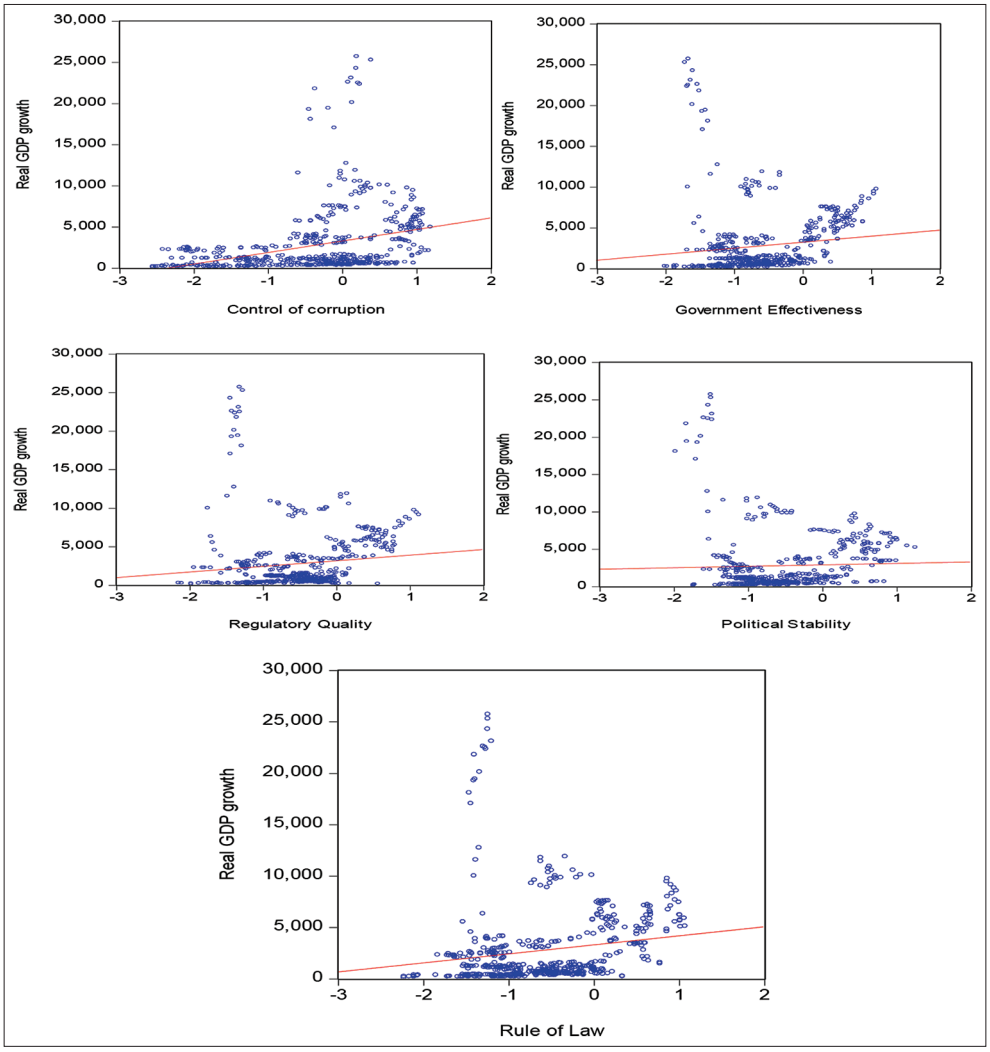

Figure C: economic growth effects of Capital and Labour in SSA