

## The Interaction Effect of Institutions and Trade Liberalization on Economic Growth in Africa

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**Abstract**—This study sets out to examine the interaction effect of institutions and trade liberalization on economic growth in selected African countries using panel data. There is a general discourse that the growth of a country depends on the level of investment which can be achieved most times via engaging in trading activities with other countries of the world. International trade, on the other hand, is enhanced by the presence of strong institutions. It has been observed that the combination of institutions and trade liberalization affect the economic growth of African countries. Finding out which of the institutions would best aid international trade and boost growth more is the aim of this study. This study used secondary data of forty African countries and employed the Least Square Dummy Variables (LSDV) and the Generalized Method of Moments (GMM) econometric techniques for estimation. The major finding of the study revealed that the interaction effect of trade liberalization, political and cultural institutions is stronger than the interaction effect of trade liberalization and economic institutions hence economic growth tends to be better in the former case than the latter in the selected SSA countries. Therefore, the study recommends that attention should be paid to the development of the economic, political, and cultural institutions simultaneously by the governments of the African countries.

**Keywords**—Interaction Effect, Trade Liberalization, Institutions, Economic Growth, Africa

### 1. INTRODUCTION

Economic growth is a sustained expansion of production possibilities measured as the increase in real Gross Domestic Product (GDP) over a given period of time [1]. The role of trade in economic growth and development is significant. The Classical and Neo-classical economists attached so much importance to international trade in a country's development that they regarded it as an 'engine of growth'. International trade increases savings and investment, reduces unemployment and under-employment, enhances greater backward and forward linkages in the economy and ensures a larger inflow of factor inputs into the economy and outflow of goods and services. Trade liberalization has been defined as a move towards freer trade through the reduction of tariff and other barriers and is generally perceived as the major driving force behind globalization [2]. The Neo-classical economists believed that the economic growth of a country depends on the level of investment [3]. Other scholars brought the concept of endogenous growth into the debate [4,5]. This was made more popular in the work of Mankiw, Romer and Weil that made human capital relevant to economic growth. Both the classical economists and the endogenous growth theorists seem to assume the institutions

in countries affect economic activities. However, the insufficient benefits that accrue to developing countries from the global world suggest that there is more to economic growth and trade than implied by the neo-classical economists [6,7,8].

According to [9], institutions are the humanly devised constraints that structure and control political, economic and social interactions amongst various economic agents. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct); and formal rules (constitutions, laws, property rights). They are a set of economic, political and social factors, rules, beliefs, values and organizations that jointly motivate regularity in individual and social behaviour [10]. They are of three types viz; economic, political and social. Economic institutions are essential for economic growth in any country due to their influence in shaping incentives for various economic actors in a society. They do not only determine the level of economic growth potential of a country, they also determine the distribution of resources and economic gains in the country. Political institutions, on the other hand, deal with the way the political structure in a country influences the behaviour of agents especially with regards to the

distribution of political power - *de jure* and *de facto* [9,11,12,13].

There is a wide spread belief that the combination of institutions and trade liberalization can affect the economic growth of African countries. But it is not clear which of the combinations whether the combination of trade liberalization and economic institution, trade openness and political institution or trade liberalization and cultural institution will bring about a better economic growth in these countries. Hence, this study sets out to examine which of these combinations would have a better impact on the economic growth of the selected African countries. Thus, the objective of this paper is to examine the interactive effect of economic, political and cultural institutions and trade liberalization on economic growth in selected African countries. The hypothesis formulated in this study stated in the null form is that:  $H_0$ : there is no significant interactive effect of economic, political, cultural institutions and trade liberalization on economic growth in the selected African countries. The remaining part of this paper is structured as follows: section II is the literature review and theoretical framework. Section III presents the methodology employed in this study. Data analysis and discussion are set out in section IV, while section V presents the summary of findings, recommendations and conclusion of the study.

## 2. Literature Review and Theoretical Framework

Without doubt, there is enough theoretical foundation that supports the fact that trade liberalization does influence institutions. For instance, [9] emphasized the role of market size and technology in engendering institutional change over time. It is widely accepted that both market size and technology are influenced by trade. Hence, trade liberalization can bring about institutional change. [14] showed that trade liberalization affects domestic political alignments through changes in factor prices. [15] opined that trade induces institutional change by strengthening commercial interests. [11] showed that trade induces institutional change through the transfer of skill-based technology which increases the income share of the middle class. The 'critical juncture' results are also related to [16,17,18,19,20], and many others who find evidence in favour of the historical origin of institutional divergence across countries.

The origin of trade in the early forms of economies was conceived of as local exchange within a small community. Trade usually expands beyond this kind of community scene to the region and longer distances and eventually to the rest of the world.

At each developmental stage, economies have elements of increasing specialization, division of labour and more

efficient technological usage. This story of gradual evolution from local autarky to specialization and division of labour was derived from the German historical school of thought [21]. Specialization is elementary whereby self-reliance is one of the key features of most individuals. As trade continues to expand, the likelihood for conflicts over the exchange of values becomes a source of concern- an issue that has to be considered before engaging in trade. The size of the market increased and transaction costs also increased markedly due to the multifaceted social networks that exist. In this case, more resources have to be employed in order to enforce rules and orders for effective trade to take place. In the absence of a state that can enforce contracts; religious and cultural beliefs can also exert some measure of standards for the conduct of those involved in the process. However, their effectiveness in lowering the costs of transaction depends on the degree to which the laid down guidelines were adhered to [22,23,24].

The growth of long distance trade usually poses two distinct transaction cost problems namely; the traditional problem of agency – the costliest of measuring performance where the influence of kingship determines the outcome of such agreements (or contracts). As the size and volume of trade expands, the problems of 'agencification' would become a significant constraint to trade. The second problem consists of contract negotiation and enforcement where there is no readily accessible way to achieve agreements and ensure contract enforcements. Negotiation and enforcement with other parts of the world involve the development of standardized weights and measures, units of account, a medium of exchange, merchant law courts and enclaves of foreign merchants, among others [9,25,26].

The theoretical base of this study is premised on the New Institutional Economics (NIE) theory, a new development in economic thought based on institutional economics and some of the principles of Neo-classical economics [12]. It has been applied in varying contexts. For instance, it can be engaged as non-technologically determined controls that can influence social interactions by providing the incentives to maintain regularity in human behaviour in historical comparative institutional analysis, [27]. The NIE theory posits that economic activities that individuals engage in can be influenced by some social and legal relationships that exist among them. Hence, NIE embraces other areas outside the immediate domain of economics like politics, science and sociology as well as the interaction these can exert on economic outcomes. This is what makes institutions to be an area of economics that has made economics more closely in touch with other social science disciplines as they can be subjected to economic analysis. The basic assumptions of New Institutional Economics (NIE) that relates to trade are three folds assumptions on individuals, assumptions on how and why individuals engage in contract; and assumptions on

how individuals govern collective action [12]. In all the assumptions, the essential point is that there should be some mechanism that regulates the participants' behaviour, as individuals can be opportunistic at times that could result to moral hazards [28]. Though some of the assumptions of NIE have been criticized especially with regards to institutional change and predictability; it is still very relevant when assessing the roles institutions play in economic relations in particular and human relations in general.

This study is also based on the theory of comparative advantage. All countries gain from trade through specializing in the production and export of goods in which they are relatively most efficient and importing the rest of their requirements from other countries that can produce them at a relatively lower cost. The result is that a given level of output can be produced more cheaply for all countries participating in international trade and invariably more employment is generated. Two major extensions of this standard proposition, namely the Heckscher-Ohlin model and Stolper-Samuelson theorem are used to explain comparative advantage. The basis for international trade arises not because of inherent technological differences in labour productivity for different products between different countries, but because countries are endowed with different factor supplies, [29].

### 3. Methodology

The model specified in this study is analyzed using two estimation techniques namely; Least Square Dummy Variable (LSDV) technique and the Generalized Method of

Moments (GMM). The choice of the LSDV technique stems from the fact that in the LSDV, all observations are pooled together but each cross-sectional observation has its own heterogeneous intercept dummy variable. Since this study used panel data, the LSDV reveals the slope coefficient peculiar to all the countries and do not take note of the individual characteristics of each entity. STATA 11.0 statistical software was used to analyze the data.

### 3.0 Generalized Method of Moments (GMM)

There are two major complications arising from estimating the dynamic panel data regression model using macroeconomic panel data. First, the presence of endogenous and/or predetermined covariates, and second, the small time-series and cross-sectional dimensions of the typical panel data set. The dynamic panel data regression model is in fact further characterized by some sources of persistence over time. There is the problem of autocorrelation which is due to the presence of a lagged dependent variable among the regressors and the other is the problem of heteroskedasticity [30]. Therefore, to resolve these shortcomings and to make the results of the estimation better, the use of the Generalized Method of Moments (GMM) estimation technique is imperative. This approach estimates the model parameters directly from the moment conditions that are imposed by the model. These conditions can be linear in the parameters or non-linear. This is used because of the possibility of endogeneity and omitted variable bias. The variables that involve institutions may be endogenous and usually have limited time variation.

### 3.1 Model Specification

The model for this study is adapted from the work of [31,32]. For the purpose of this study, the model is specified as:

$$Grgdp = f(Gkap, Lab, Open, Hkap, Open * Reprisk, Open * Cim, Open * Ethsion) \quad (3.1)$$

Stating equation (3.1) in econometric form gives:

$$Grgdp_t = \beta_{0i} + \beta_{1i}Gkap_t + \beta_{2i}Lab_t + \beta_{3i}Open_t + \beta_{4i}Hkap_t + \beta_{5i}Open * Reprisk_t + \beta_{6i}Open * Cim_t + \beta_{7i}Open * Ethsion_t + \varepsilon_t \quad (3.2)$$

where;  $\beta_0$  is the intercept. The  $\beta_i$ 's,  $i = 1-7$ , being coefficients. When  $\beta_5 \dots \beta_7 > 0$  (there is interaction effect);  $\beta_5 \dots \beta_7 < 0$  (there is no interaction effect). The *A priori*,  $\beta_1 \dots \beta_7$  are expected to be positively related to economic growth, the dependent variable.

Gkap: gross fixed capital formation (proxy for capital or investment); Lab: employment to population ratio (proxy for labour); Open: degree of openness (measure of trade liberalization); Hkap: human capital (proxied by primary and secondary school enrolments); Reprisk: repudiation risk (proxy for contracting institutions – this measures contract enforcement between private citizens, the measure operates on an eleven point scale ranging from 0 to 10 with a high score implying better contracting institutions); Cim: contract

intensive money (proxy for political institutions - Cim measures the extent of democracy and property rights, these influence the accessibility and willingness of economic agents to exercise property rights); Ethsion: ethnic tensions (proxy for cultural institutions – ethnic tension measures the relative peace in a country and is measured on a 0-6 scale, with higher values implying lower ethnic tension). Open\*Reprisk; Open\*Cim and Open\*Ethsion are the new variables introduced into the growth equation. These new variables are obtained thus; they are the products of the degree of trade openness and the estimated values of the institutional variables viz; repudiation risk, contract intensive money and ethnic tensions respectively. For each of the institutional variable, the mean value was used as a yardstick, any value above this mean value is ascribed 1 and

any value below the mean value is ascribed 0. It is this binary variable that is then used to multiply the trade liberalization variable (degree of trade openness) that gave us the new variable. When the coefficient of the new

variable is greater than 0, there is an interaction effect between trade liberalization and institutions while if is less than 0, there is no interaction effect between trade liberalization and institutions.

Expressing equation (3.2) as a linear panel data model gives:

$$Grgdp_{it} = \beta_{0i} + \beta_{1i}Gkap_{it} + \beta_{2i}Lab_{it} + \beta_{3i}Open_{it} + \beta_{4i}Hkap_{it} + \beta_{5i}Open * Reprisk_{it} + \beta_{6i}Open * Cim_{it} + \beta_{7i}Open * Ethsion_{it} + \varepsilon_{it} \quad (3.3)$$

Since the Ordinary Least Squares (OLS) technique will not yield consistent estimate for panel data, we used the Least Square Dummy Variable (LSDV) technique to take care of the inherent deficiency in the usage of OLS. However, the limitations of the LSDV includes; (i) there is the degrees of freedom problem arising from introducing too many dummy variables; (ii) the problem of multicollinearity arising from too many variables, both individual and multiplicative, this makes precise estimation of one or more parameters difficult; and (iii) the LSDV may not be able to identify the impact of time invariant variables. Due to these limitations, this study introduced the concept of dynamic panel data [33]. As a result of this, the study assumed that there is a

connection between the level of growth experienced in a country in the preceding year with that of the current level, that is, the level of growth achieved in the previous year has a link with the level of growth that the country would attain in the current year. In other words, there is integrated growth in the country. This is particularly necessary because the economy is assumed not to exist in isolation; there are interconnections among the various sectors in the economy, hence, the economic activities in the preceding year have a bearing with current economic activities. This is why the dynamic panel data is used in this study to estimate this link, and this will be estimated using the Generalized Method of Moments (GMM) estimation technique[24].

Expressing equation (3.3) as a linear dynamic panel data model we have:

$$Grgdp_t = \beta_{0i} + \beta_{1i}Grgdp_{t-1} + \beta_{2i}Gkap_{it} + \beta_{3i}Lab_{it} + \beta_{4i}Open_{it} + \beta_{5i}Hkap_{it} + \beta_{6i}Open * Reprisk_{it} + \beta_{7i}Open * Cim_{it} + \beta_{8i}Open * Ethsion_{it} + \varepsilon_{it} \quad (3.4)$$

where;  $i = 1, 2, \dots, 40$  (countries);  $t = 1, 2, \dots, 35$  (years).  $i = 1, \dots, N$ ,  $t = 2, \dots, T$ ;  $\varepsilon$  is the error term. The coefficients  $\beta_1 \dots \beta_8$  are coefficients.  $\beta_0$  is the intercept. *A priori*, the coefficients  $\beta_1 \dots \beta_8$  are positively related with the dependent variable, economic growth (Grgdp).

Equation (3.4) can be decomposed into three to show the interaction effects of trade liberalization and economic, political and cultural institutions on economic growth respectively. We express these as equations (3.5), (3.6) and (3.7) as follows:

$$Grgdp_t = \beta_{0i} + \beta_{1i}Grgdp_{t-1} + \beta_{2i}Gkap_{it} + \beta_{3i}Lab_{it} + \beta_{4i}Open_{it} + \beta_{5i}Hkap_{it} + \beta_{6i}Open * Reprisk_{it} + \varepsilon_{it} \quad (3.5)$$

$$Grgdp_t = \beta_{0i} + \beta_{1i}Grgdp_{t-1} + \beta_{2i}Gkap_{it} + \beta_{3i}Lab_{it} + \beta_{4i}Open_{it} + \beta_{5i}Hkap_{it} + \beta_{6i}Open * Cim_{it} + \varepsilon_{it} \quad (3.6)$$

$$Grgdp_t = \beta_{0i} + \beta_{1i}Grgdp_{t-1} + \beta_{2i}Gkap_{it} + \beta_{3i}Lab_{it} + \beta_{4i}Open_{it} + \beta_{5i}Hkap_{it} + \beta_{6i}Open * Ethsion_{it} + \varepsilon_{it} \quad (3.7)$$

### 3.2 Data Sources

This study employed data covering forty (40) African countries over a thirty-five year period; comprising both time series and cross-sectional data. These forty (40) countries were selected based on the World Bank's (2007) classification of countries into 'moderately outward-oriented', 'moderately inward-oriented' and 'strongly inward-oriented countries'. In addition, they are all developing countries and belong to the African continent. (The list of selected countries is highlighted in the Appendix). The data for gross fixed capital formation, human capital, real gross domestic product, labour are sourced from the World Bank's World Development

Indicators (WDI), while repudiation risk, contract intensive money and ethnic tension are sourced from the International Country Risk Guide (ICRG). The time frame for the data covers 1981 to 2015, an era that witnessed the introduction of trade policy regimes and economic reforms such as the introduction of Structural Adjustment Programmes (SAP) in some of the African countries [34,35].

### 4. Data Analysis and Discussion

The starting point of the analysis is to determine the stationarity condition of the time series variables using panel unit root test. The panel unit test can be carried out on a

pooled data when two conditions are met; first, the time series and cross-sectional observations must be more than fifteen years each and second, the panel must be balanced, that is, there should not be any missing data. This study met these two conditions. The null and alternative hypotheses are formulated as:

$H_0$ : All panels contain unit roots.

$H_1$ : At least one panel is stationary.

Equations (3.5), (3.6) and (3.7) were analysed to obtain the results presented in Tables 1, 2 and 3 below. The rule of thumb for decision making under panel unit root test involves the rejection of the null hypothesis at the 1 percent statistical significance level. The results presented in Table 1 are the panel unit root tests of the variables. It reveals that all the variables used in the growth model are statistically significant at 1 percent. Therefore, we reject the null hypothesis.

**Table 1: Augmented Dickey Fuller (ADF) Unit Root Test Results at Levels**

Variables	Chi-squared Statistic	Remark
Grgdp	208.02 <sup>***</sup> (0.0000)	Stationary
Grgdp <sub>t-1</sub>	212.03 <sup>***</sup> (0.0000)	Stationary
Gkap	144.07 <sup>**</sup> (0.0034)	Stationary
Lab	135.44 <sup>***</sup> (0.0086)	Stationary
Open	124.04 <sup>***</sup> (0.0000)	Stationary
Hkap	180.07 <sup>***</sup> (0.0002)	Stationary
Open*Reprisk	245.37 <sup>***</sup> (0.0000)	Stationary
Open*Cim	129.67 <sup>**</sup> (0.0322)	Stationary
Open*Ethsion	90.51 <sup>**</sup> (0.0275)	Stationary
Number of panels: 40		
Number of periods: 35		

**Source:** Estimated by the Authors, 2017. Probability values are displayed in parentheses beside the chi-squared coefficients.

**Note:** \*\*\* - significant at 1 percent, \*\* - significant at 5 percent.

Table 2 shows the result of Variance Inflation Factor (VIF) test for multicollinearity. The results showed that all the variables have VIF values less than 10 and 1/VIF greater

than 0.10 which is the ideal condition for no multicollinearity among variables. Thus, there is no multicollinearity among the explanatory variables.

**Table 2: Variance Inflation Factor (VIF) Test for Multicollinearity**

Variable	VIF	1/VIF
Grgdp	7.85	0.1273
Grgdp <sub>t-1</sub>	7.15	0.1396
Gkap	3.01	0.3334
Lab	2.08	0.4820
Open	1.86	0.5396
Hkap	1.72	0.5866
Open*Reprisk	1.64	0.6187
Open*Cim	1.46	0.6969
Open*Ethsion	1.27	0.7987

Mean VIF 2.94

**Source:** Estimated by the Authors, 2017.

The results in Table 3 present the step-wise estimates of our models. Equation (3.5) was estimated to examine the interaction effect between trade liberalization and economic institutions and the results are presented as regression I. Equation (3.6) was estimated to examine the interaction effect between trade liberalization and political institutions

and the results are presented as regression II. Lastly equation (3.7) was estimated to examine the interaction effect between trade liberalization and cultural institutions and the results are presented as regression III. The results showed that all the variables are statistically significant and have varying magnitudes on economic growth. The results also

revealed that the adjusted  $R^2$  are 0.281, 0.285 and 0.284 in regressions I, II and III respectively. This suggests that independent variables in the model explain 28.1 percent, 28.5 percent and 28.4 percent variations in the dependent variable, Grdp respectively. The F-statistic results showed that the estimates are statistically significant at 1 percent. The result also revealed that the coefficient of Open\*Reprisk is -0.228 (which is less than 0) while the coefficients of Open\*Cim and Open\*Ethnsion are 0.237 and 0.370 (which are greater than 0) respectively. This implies that there is no interaction effect between trade liberalization and economic institutions while there is an interaction effect between trade liberalization and political and cultural institutions.

Therefore, we conclude that the impact of trade liberalization on economic growth is more significant when strong political and cultural institutions are involved; and less significant when strong economic institutions are involved. Also, since the results of the interactions between trade liberalization and political institutions are not too far from the interaction effect between trade liberalization and cultural institutions, we conclude that both political and cultural institutions are important. Hence, there is a need for the African countries to have strong political, cultural and economic institutions. The implication of these observed interaction effects is that international trade among countries seem to be affected more by strong political and cultural institutions than strong economic institutions. Hence, relative peace and political stability of the African countries encourage trading activities to take place among the countries and with other countries of the world.

Table 4 presents the system GMM estimates of our model presented in Equation (3.2). The system GMM estimator is categorized into one-step and two-step options. The results in Table 4 begin with some diagnostic tests. The starting point assumes that, the individual errors are serially uncorrelated for the system GMM estimators for consistent estimations. The presence of autocorrelation will indicate that lags of the dependent variable (and any other variables used as instruments that are not strictly exogenous), are in fact endogenous, hence bad instruments. [36] develop a test for this phenomenon that would potentially render some lags invalid as instruments. Of course, the disturbance  $\varepsilon_{it}$  is presumed autocorrelated because it contains fixed effects,

and the estimators are designed to eliminate this source of trouble.

The Arellano-Bond test for autocorrelation is applied to the differenced residuals to purge the unobserved and perfectly autocorrelated individual errors. These results are reported as AR(1), AR(2) and AR(3) in the lower portion of Table 4. The AR(1) is the only one out of the three that is valuable and useful in determining the validity of the estimates. The AR(1) must be significant at 5 percent, but it is not mandatory that AR(2) and AR(3) must be significant, although if they are significant it adds to the validity of the estimates. The null hypothesis here that  $cov(\Delta v_{it}, \Delta v_{i,t-k}) = 0$  for  $k = 1, 2$  and  $3$  is rejected at 5 percent level if  $p < 0.05$ . This null hypothesis implies that the standard errors are consistent. If  $v_{it}$  are serially uncorrelated, then the null hypothesis of no serial correlation will be rejected at AR(1) but not at higher orders. In Table 4, it can be concluded that there is no evidence of serial correlation at 1 percent level of significance since AR(1) is significant in the one-step and two-step GMM. Given these results, the estimates can be regarded as consistent.

Still on the results in Table 4, the next diagnostic test is a test of over-identifying restrictions of whether the instruments, as a group, appear exogenous. This test of instrument validity is a comparison of the number of instruments used in each case and the related number of parameters. It is implemented by the Sargan and Hansen J tests. The Sargan and Hansen J tests are used to test if the instruments as a group are exogenous. The test is carried out to either accept or reject the null hypothesis that states that the instruments as a group are exogenous. The higher the p-value of the Sargan statistic, the better. For one-step, non-robust estimation, the Sargan statistic which is the minimized value of the one-step GMM criterion function is applicable. The Sargan statistic in this case is, however, not robust to autocorrelation. So for one-step, robust estimation (and for all two-step estimation), the *xtabond2* (STATA command) also reports the Hansen J statistic, which is the minimized value of the two-step GMM criterion function, and is robust to autocorrelation. In addition, *xtabond2* still reports the Sargan statistic in these cases because the Hansen J test has its own problem: it can be greatly weakened by instrument proliferation.

Table 3: Interaction Effect Estimation Results

DEPENDENT VARIABLE – MEASURE OF ECONOMIC GROWTH (Grgdp)							
VARIABLE	REGRESSION I		REGRESSION II		REGRESSION III		
	LSDV OLS	Pooled	LSDV	Pooled OLS	LSDV	Pooled OLS	
Gkap	0.383*** [6.09] [5.22] (0.000)	0.297*** (0.000)	0.381*** [6.05] [5.25] (0.000)	0.292*** (0.000)	0.381*** [6.06] [5.26] (0.000)	0.284*** (0.000)	
Hkap	0.283** [1.83] [1.69] (0.068)	0.098* (0.098)	0.274* [1.78] [2.25] (0.076)	0.096** (0.011)	0.284* [1.79] [2.26] (0.077)	0.087** (0.011)	
Lab	0.256** [2.59] [2.84] (0.021)	0.412*** (0.001)	0.588*** [2.52] [2.84] (0.001)	0.211*** (0.003)	0.611*** [2.53] [2.85] (0.002)	0.199*** (0.003)	
Open	0.053* [1.63] [2.19] (0.094)	0.024** (0.022)	0.080* [1.71] [1.74] (0.092)	0.076* (0.085)	0.082* [1.73] [1.76] (0.093)	0.078* (0.086)	
Open*Reprisk	-0.228** [2.65] [1.90] (0.014)	-0.046* (0.067)	-	-	-	-	
Open*Cim	-	-	0.237* [1.96] (0.092)	0.343** [2.03] (0.047)	-	-	
Open*Ethsion	-	-	-	-	0.370* [1.74] [2.06] (0.094)	0.272** (0.048)	
Constant	8.433** [2.09] [2.08] (0.030)	2.127** (0.033)	0.455** [2.09] [2.11] (0.026)	2.177*** (0.009)	0.465** [2.11] [2.13] (0.028)	2.159*** (0.008)	
R <sup>2</sup>	0.329	0.192	0.329	0.193	0.331	0.203	
Adjusted R <sup>2</sup>	0.281	0.177	0.285	0.187	0.284	0.187	
F-stat	5.62 (0.000)	6.27 (0.000)	5.58 (0.000)	6.29 (0.000)	5.57 (0.000)	6.29 (0.000)	
Country Dummy	Yes	No	Yes	No	Yes	No	
No of Countries	40	40	40	40	40	40	
Number of Observations	1400	1400	1400	1400	1400	1400	

**Source:** Estimated by the Authors, 2017. **Notes:** Regression I are the results for the interaction effect of trade openness and economic institutions; regression II are the results for the interaction effect of trade openness and political institutions; regression III are the results for the interaction effect of trade openness and cultural institutions respectively. \* - significant at 10 percent; \*\* - significant at 5 percent; \*\*\* - significant at 1 percent.

Only the respective *p-values* are reported for this test results in the lower part of Table 4. Here, the null hypothesis that the population moment condition is valid is not rejected if  $p > 0.05$ . The summary statistics indicate that the one-step and two-step system GMM dynamic panel models of the selected forty African countries have 40 instruments and 11 parameters each. This represents a total of 19 over-identifying restrictions in each case. The number of instruments satisfies the rule that says that the number of instruments should be less or equal to the number of groups. In this study, we have thirty-five sampled countries. In both specifications, the Hansen–J statistic does not reject the

Over-Identifying Restrictions (OIR), thus confirming that the instrument set can be considered valid. The Sargan test is significant at 5 percent. The F-statistic obtained are considerably not satisfactory because the result in each case is not significant at one, five and ten percents. This is indicative that all the exogenous variables do not jointly explain significantly, the economic growth process across the sampled African countries over the study period.

The results in Table 4 also showed that all the coefficients of the explanatory variables are positive and the estimates are consistent with theoretical expectations. The Blundell–Bond

(system-GMM) robust estimates indicate that the lagged growth value (first lag) is correctly signed and statistically significant across the sampled African countries. In other words, past realizations of economic growth do produce some significant impact on the current level of economic growth. The stock of capital proxied by gross fixed capital formation showed a very interesting result in the Blundell–Bond robust estimates. One striking observation here is that the stock of capital produced a positive impact on economic growth across the sampled countries over the study period. This variable is also statistically significant at the 5 percent level in the one-step and two-step system GMM options. This result supports the *a priori* expectation. It is, therefore, expected that capital stock would have a positive impact on economic growth in the selected economies. Theoretically, the implication of this result is that investment is expected to increase in these African countries which would improve on the economic growth of these economies. In terms of the degree of trade openness (Open) variable, it had the expected positive sign and is statistically significant at 5 percent. A 1 percent change in the degree of trade openness under the two-step system GMM estimates brings about a

greater proportionate change in economic growth across the study group. The implication of this is that international trade plays an important role in the growth of the selected African countries.

In terms of the interaction effect of institutions and trade liberalization on economic growth, the results showed that the interaction effect of political and cultural institutions and trade liberalization have a better influence on economic growth than the interaction effect of economic institution and trade liberalization on economic growth. Although, their coefficients are correctly signed, they all have positive impact on economic growth of the sampled African countries. The implication of this interaction effects between trade liberalization and institutions is that international trade among countries seem to be affected more by strong political and cultural institutions than strong economic institutions. Relative peace and political stability in these African countries encourage trading activities to take place among the countries and with other nations of the world.

**Table 4: GMM Estimation Results**

Dependent Variable – Grdp		
SYSTEM-GMM		
Regressors	One-step Collapsed	Two-step Collapsed
	(1)	(2)
Grdp(-1)	0.268*** (0.000)	0.198*** (0.000)
-		
Gkap	0.441** (0.045)	0.480** (0.042)
Hkap	0.161* (0.083)	0.140** (0.037)
Lab	0.084** (0.045)	0.172** (0.040)
Open	0.281** (0.047)	0.130** (0.048)
Open*Reprisk	0.167** (0.011)	0.178** (0.034)
Open*Cim	0.294** (0.026)	0.246** (0.029)
Open*Ethision	0.182** (0.081)	0.187** (0.028)
Constant	0.299** (0.027)	-1.426*** (0.006)
No. of Instruments	35	35
Country Effects	No	No
F-stat (Wald $\chi^2$ )	66.41	1544.32
F-stat (p-value)	[0.000]	[0.000]
AR(1)	[0.000]	[0.001]
AR(2)	[0.967]	[0.771]
AR(3)	-	[0.541]
No of Observations	1042	1042
Sargan Test (OIR)	[0.045]	[0.045]
Hansen Test (OIR)	-	[0.726]
Number of Countries	40	40

**Source:** Estimated by the Authors.

**Notes:** The standard errors are robust and consistent in the presence of any pattern of heteroskedasticity and autocorrelation.



## 5. Summary of Findings, Recommendations and Conclusion

This section presents the summary of major findings of the study, the recommendations made and the conclusion, with a view to examining the interaction effect of institutions and trade liberalization on the economic growth of selected African countries.

### 5.1 Summary of Findings

The main findings of the study are enumerated below:

1. The study found out that there is a significant positive impact of the trade liberalization variable – degree of trade openness on economic growth of the selected African countries. The implication of this is that international trade is positively beneficial to a country especially if the country is an exporter of goods and services rather than being just an importer of goods and services. It would be beneficial economically if the governments of these countries should embark on policies that will boost industrialization to increase the level of output and as a result increase their levels of exports.
2. The study also found out that trade liberalization is enhanced more when strong political and cultural institutions are in place than strong economic institutions. Peace and economic stability encourage international trade.
3. The result on the stock of capital variable – Gross Fixed Capital Formation showed that capital is very important in determining the interaction effect of institutions and trade liberalization on economic growth in the selected African countries. Though, capital has significant positive impacts on the three interaction effects, but it has a higher positive impact in the interaction of trade liberalization and economic institutions than that of trade liberalization and political / cultural institutions. This supports theoretical expectation which postulates a significant influence of capital on economic growth.
4. Furthermore, education which is a measure of human capital development is found to exhibit positive influence on economic growth in the selected African countries. This supports theoretical assertion of a positive relationship between education and economic growth. Also, human capital growth is believed to be important in the determination of the quality of institutions [37]. The implication of this finding is that though human capital plays a vital role in improving the level of economic growth; the story among the sampled African countries used in this study seems to be different empirically; human capital has not had a great impact on institutional quality.
5. Finally, this study also found out that the preceding level of GDP ( $Grgdp_{t-1}$ ) has a negative relationship with economic growth which supports what theory asserts [4,38]. The result also reveals that the preceding level of growth has significant negative impact in the three interaction effects of trade liberalization and institutions but least negative impact is seen in the interaction effect of trade liberalization and

cultural institutions. The implication of this is that the current level of growth must surpass the preceding year's level of growth. The governments of these African countries should strive to achieve this.

### 5.2 Recommendations

Based on the findings noted above, the following recommendations are made by the study: First, since human capital plays a crucial role in boosting economic growth in the selected African countries, the study strongly recommends that the government should find ways that will be geared towards improving the stock of human capital in the African continent. Some of these include the training and retraining of experts such as lawyers, economists, accountants, among others, in the African countries and their respective ministries such as trade, justice, commerce and industry. This is because a well-informed and trained crop of persons that control policy formulation and implementation in these institutions are essential. This is most crucial in this 21<sup>st</sup> century era which is mostly knowledge-driven.

Second, it is also recommended that there is a need to ensure that contracts are made easily enforceable. This is a very important tool that can be used to improve international trade in the African countries. If effective contract enforcement procedures are in place, transaction costs will be reduced and this will eventually improve the level of trade openness in the sub-region. Third, the study also recommends that there is a need for the selected African countries to keep improving on their level of growth annually by ensuring that they surpass the growth level of the preceding year. One of the ways this can be done is for these countries to embark on export promotion strategies that will make them exporting countries rather than just being importing countries. When this is done, they will earn foreign exchange that will be used for investment purposes. Lastly, the study recommends that the governments in these African countries should develop the economic, political and cultural institutions simultaneously. This is achievable when the relevant authorities in a country develop an environment in which fair and predictable rules form the basis for economic, political and social interactions.

### 5.3 Conclusion

This study examined the interaction effect of institutions and trade liberalization on economic growth in selected African countries. In order to contribute to existing knowledge, this study used a sample of forty (40) countries in Africa for the period 1981-2015 to empirically evaluate which combinations of economic, political, cultural institutions and trade liberalization will have better effect on economic growth in the selected African countries. The major findings from this study revealed that the interaction of political and cultural institutions with trade openness have significant impact on economic growth, than that of economic institutions and trade liberalization. For these

African countries to harness maximum gains from international trade, there must be strong institutions. Therefore, there is a need for the governments of these

African countries, especially the sampled countries to develop strong institutions in order to ensure the vigorous growth of their economies.

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#### Appendix: List of Countries and their identifier (id)

id	Central	id	East and Southern Africa	id	West Africa		North Africa
2	Angola	4	Botswana	3	Benin Republic	1	Algeria
5	Burundi	12	Djibouti	7	Cape Verde	13	Egypt
6	Cameroon	15	Ethiopia	11	Cote d'Ivoire	22	Libya
8	Central African Republic	20	Kenya	17	Gambia	25	Morocco
9	Chad	21	Lesotho	18	Ghana	38	Tunisia
10	Congo	23	Madagascar	28	Niger		
14	Equatorial Guinea	24	Malawi	29	Nigeria		
16	Gabon	26	Mozambique	31	Senegal		
19	Guinea	27	Namibia	37	Togo		
		30	Rwanda				
		32	Seychelles				
		33	South Africa				
		34	Sudan				
		35	Swaziland				
		36	Tanzania				
		39	Uganda				
		40	Zambia				

Source: UNCTAD (2009) Handbook of Statistics; WTO (2009) International Trade Statistics