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Time Series Analysis of Export and Economic Growth in the Ecowas Countries

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Abstract: This study looked at the impact of export on economic growth in the countries that form the West Africa Monetary Zone (WAMZ) of the ECOWAS countries. The work adopts unit root, cointegration and error correction approaches which are suitable for modeling export and growth in a non-stationary environment. The value of the coefficient of aggregate export for all the countries is low. However, the results indicate that export contributed to growth in the WAMZ countries. Therefore, an improvement in export is advocated to put the nation on the right track of development. The positive and significant coefficient of aggregate export in all the four countries confirms the results from the statistical data that export is the engine of growth in the ECOWAS countries. The study suggested that more accurate export drive be put in place and for import to be redirected.

Key word: Economic growth impact of export, WAMZ

INTRODUCTION

Despite its authoritarian past, many West African countries have demonstrated a national capacity and willingness to undertake fundamental economic reforms. The main thrust of the reforms has been a libralised economy in which the rate of trade particularly exports will develop. The idea that international trade and most important export is the engine of growth is very old, going back at least to Adam Smith.

Many studies have explored the relationship between export and economic growth. Almost all previous studies rely on cross section data. One general problem with cross section data is that the studies using cross section data estimate average relationships and does not provide much information on the specific countries. Only a handful of studies, used time series data. But, most of the available time series studies especially in these study areas do not grapple with the issues of non-stationarity of data and may have estimated spurious regressions. As we will see later, most of the variables used in this study are non-stationary in their levels. This study is the first attempt at using statistical data and time series data exploiting the tools from recent research in time series econometrics.

The objective of this paper is to look at the impact of exports on economic growth in the countries that comprise the West Africa Monetary Zone of the ECOWAS countries for which data for a reasonable length of time is available.

Export and foreign trade in general play a central role in a country's economic growth and development. There has been a general global shifted towards the growth of export in recent years. Export growth is said to result in increased output, employment and consumption, all of which lead to an increase in the demand for a country's output. Furthermore, a buoyant export sector enlarges the domestic market so that firms achieve economies of scale and thus lower unit costs. This may be expected because an export sector allows a country to trade along its lines of comparative advantage, specializing not only in commodities that use its abundant factors intensively, but also where its per unit costs are lower. This generally leads to efficient resource allocation. This efficiency is further enhanced by exposure to international competition which forces firms to adopt modern technology and produce quality products that meet the demands of sophisticated consumers in international markets.

Trade may also benefit a country with positive export externalities, which lead to increase productivity and economic growth[1-3]. Furthermore, trade may help a

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developing country to overcome the ax-ante saving-investment gap and the ax-ante import-export gap by providing the necessary foreign exchange for development[4, 5]. Moreover, countries engaged in trade are thought to be more able to respond to and weather unfavourable external shocks than those following the inward-looking development strategy[6].

The fact that exports cause economic development has led to the adoption of massive export by many countries[7-13, 6]. However, there are still questions as to whether the export strategy will also be beneficial to the monocultural economies of the ECOWAS countries. This question will be the focus of this paper.

MATERIALS AND METHODS

The econometric evidence for the contribution of exports of ECOWAS to economic growth is based on the aggregate production function models. The production function is defined as:

$$Y_t = f(K_t L_t) \quad (1)$$

The model assumes that, along with conventional inputs of capital and labour used in the Neoclassical production function, unconventional inputs like exports and other variables may be added into the model to capture their contribution to economic growth. The model is used by, among others[2, 6]. Following the production function, the general models to be estimated for ECOWAS countries are defined as follows:

$$y_t = \lambda_0+\lambda_1 k_t+\lambda_2 l_t+\lambda_3 x_t+\lambda_4 x_{pt}+\lambda_5 x_{mt} +\lambda_6 m_t+\lambda_7 g_{ct}+\lambda_8 y_{t-1}+\lambda_9 y_{w,t}+V_1 \quad (2)$$

The log transformation was used such that equation 2 becomes

$$\log y_t = \lambda_0+\lambda_1 \log k_t+\lambda_2 \log l_t+\lambda_3 \log x_t+\lambda_4 \log x_{pt}+\lambda_5 \log x_{mt} +\lambda 6 \log m_t+\lambda_7 \log g_{ct}+\lambda_8 \log y_{t-1}+\lambda_9 \log y_{w,t}+V_2 \quad (3)$$

Where y_t is real GDP, k and l are the normal neoclassical conventional inputs of capital k_t, which is proxied by the ratio of gross capital formation and labour force (l_t). The other variables are the unconventional inputs and include aggregate exports (x_t), primary exports (x_{pt}) manufactured exports (x_{mt}), imports (m_t), private sector (p_t), which is proxied by private sector consumption in real GDP; government sector consumption (g_{ct}), previous period growth in real GDP (y_{t-1}) and finally, world GDP (y_{wt}) which is proxied by GDP for USA V_1 and V_2 are error terms. All these variables are assumed to play an important role in the economic growth of developing countries.

The study centered on countries in the proposed West Africa Monetary Zone (WAMZ) of the ECOWAS countries. These countries are Gambia, Ghana, Guinea, Nigeria and Sierra Leone.

Data used for this study come from the World Development Indicator 2005. Annual data are used as follows: Nigeria (1970-2002), Ghana (1970 -2002), Gambia (1970-2002) and Sierra Leone (1980-2002). Sufficient data were not available for Guinea, so the analysis for this country was not included.

The time series characteristics of the model: Any time series can be thought of as being generated by a stochastic or random process[14], it is therefore necessary to test whether the data are stationary. To this end, the Augmented Dickey-Fuller (ADF) test is used.

A formal test for nonstationarity is the Dickey-Fuller test. The standard Dickey-Fuller Test assumes that our series, say Y, follows the following AR (1) process:

$$Y_t = \alpha_1 Y_{t-1} + Ut \quad (4)$$

Equation (4) suggest that a simple test for stationarity would be to test
$H_0 : \alpha_1 = 1$ against $H_1 : \alpha_1 < 1$. Acceptance of $H_0 : \alpha_1 = 1$ suggests that Y_t is non-stationary (what we call a random walk model).

In practice it is conventional to base the test on a modified version of (4). The modification is to deduct Y_{t-1} from both sides of the expression. (This modification is particularly useful if we are dealing with higher order AR processes).

$$Y_t-Y_{t-1} = \alpha_1 Y_{t-1}-Y_{t-1} + U_t = Y_t-Y_{t-1} =(\alpha_1-1) Y_{t-1} + U_t = \Delta Y_t = \theta Y_{t-1} + U_t \quad (5)$$

Where $\Delta Y_t = Y_t-Y_{t-1}$ and $\theta = \alpha_1-1$
Using the results of the regression of ΔY_t on Y_{t-1}, we test H_0: $\theta = 0$ against H_1: $\theta < 0$. (This is the same as testing H_0: α_1-1 against H_1: $\alpha_1 < 1$, since $\theta = \alpha_1-1$).

As before, acceptance of H_0 suggests Y_t is non-stationary; rejection of H_0 suggests Y_t is stationary.

The standard DF test can be extended to include a constant term and/or a deterministic time trend. The extended DF test equations are:

$$\Delta y_t = \beta_1 + \theta Y_{t-1} + U_t \quad (6)$$

$$\Delta y_t = \beta_1 + \lambda t + \theta Y_{t-1} + U_t \quad (7)$$

The above models may also be augmented to include autoregressive processes up to order p. These models are

known as augmented Dickey-Fuller (ADF) equations. Combining (7) with an autoregressive process up to order p yields the extended ADF test equation.

$$\Delta Y_t = \beta_1 + \lambda_t + \theta Y_{t-1} + \gamma_1 \sum_{i=1}^{p} \Delta Y_{t-1} + U_t \quad (8)$$

To test for a cointegration or a long-run relationship between the dependant and independent variables, most researchers first regress the levels of the variables under consideration using OLS, and then test for stationarity of the residuals using a unit root test such as the ADF test. If the residuals are stationary, the variables are cointegrated, thereby implying a long-run stationary relationship between the dependent and independent variables. Furthermore, Stock[15] has shown that, even if the residuals are serially correlated, the parameter estimates from the long run regression are super-consistent, in the sense that they converge to their true values much faster than in the stationary case. There are, however, a number of problems associated with this simple technique as a solution to non-stationarity.

First, as Banerjee *et al*.,[16, 17] have shown, in spite of the super-consistency property, the bias on the parameter estimates can be quite severe in small samples. Second, the estimates are not invariant to the chosen normalization, (i.e., which variables to be used as dependent variable and which to be used as independent variables). Third, when there are more than two variables involved, the possibility of multiple cointegration relationships arises. In general, there may exist up to N-1 stationary linear relationships among N non-stationary variables. Conducting the static OLS regression only makes it possible to estimate one of these. Finally, the OLS parameter estimates are not normally distributed if the variables are I(1) processes. This makes standard inference invalid, and therefore it is not possible to test interesting hypotheses.

To address these problems, the Johansen multivariate cointegration procedure developed by Johansen[17, 18] and Johansen and Juselius[19] is followed. This procedure is based on maximum likelihood estimation of a Vector Autoregressive (VAR) system. Given a Nx1 vector of variables X_t (in our study X_t = (y_t, k_t, l_t, x_t, x_{pt}, x_{mt}, m_t, g_{ct}, y_{t-1}, y_{wt}), N = 10) and considering a VAR model of order k:

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} + \ldots + A_k X_{t-k} + \epsilon_t \quad (9)$$

Where X_t is a vector of N I(1) variables, A_1, A_2 …, and A_k are NxN parameter matrices of coefficients to be estimated, k is the optimal number of lags determined by the Likelihood Ratio (LR) test, and ϵ_t is a Nx1 vector of errors that may be contemporaneously correlated with each other but are assumed to be uncorrelated with their own lagged values as well as all of the right-hand side variables. Using $\Delta = 1 - L$, where L is the lag operator, the above VAR model can be represented by the following ECM expression:

$$\Delta x_t = \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \ldots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + \epsilon_t \quad (10)$$

Where $\Pi = -(I - A_1 - A_2 - \ldots - A_k)$ (I is an identity matrix), and $\Gamma_1 = -I + A_1 + A_2 + \ldots + A_i$, i = 1, 2 …, k-1.

According to Keewan *et al*.[17] the matrix Π, whose dimensions are N×N, can be expressed as a product of two matrices: $\Pi = \alpha\beta'$, where α indicates the speed of adjustment to equilibrium (i.e., ECM component), and β is the cointegrating vector. Two different tests, namely the trace statistic test and the maximum eigenvalue statistic test are used to test for cointegration relationships among the variables.

RESULTS AND DISCUSSION

As a preliminary step to testing for cointegrtion in Eq. 3 we executed Augmented Dickey-Fuller (ADF) unit root test statistics on the series used. These results are displayed in Table 1 to 4. Augmented Dickey Fuller

Table 1: Unit root test for Nigeria

Series	ADF statistics with constant[a]	DF-GLS[b] statistic with constant	S/NS
y_t	-0.283322	-1.050838	NS
l_t	-1.025545	0.154308	NS
x_t	-0.543267	-0.670147	NS
x_{mt}	-1.286684	-0.987946	NS
m_t	-0.965320	-0.1249631	NS
g_{ct}	-0.619022	-0.04933	NS
y_{wt}	-0.600889	0.299005	NS
x_{pt}	-0.682157	0.589259	NS
y_{t-1}	-0.258719	-1.016950	NS
k_t	-3.312702	-2.118474	S
Critical values at 5%	-2.957110	-1.952473	
First difference			
y_t	1.082780	-0.688642	NS
l_t	-7.387144*	-2.38788*	S
x_t	-5.669605*	-5.650489*	S
x_{mt}	-7.235648*	-6.157436*	S
m_t	-4.570330*	-4.011467*	S
g_{ct}	-5.144242*	-5.762914*	S
y_{wt}	-4.605489*	-4.616783*	S
x_{pt}	-7.097750*	-7.160677*	S
y_{t-1}	-3.997042*	-2.470520*	S
Critical values at 5%	-2.981038	-1.952473	
Second difference			
Y	-6.002332*	-2.976529	S
Critical value at 5%	-2.981038	1.953381	

a = Augmented dickey-Fuller test statistics.
b = Dickey-Fuller test statistics
* = Statistically significant at 0.05 level.
S = Stationary,
NS = Non-stationary, Source: Data Analysis

Table 2: Unit root test for Ghana

Series	ADF statistics with constant[a]	DF-GLS[b] statistic with constant	S/NS
y_t	-0.049365	-0.575971	NS
l_t	-0.622210	0.121983	NS
x_t	-2.159354	-1.747662	NS
x_{mt}	-2.058252	-1.988537*	S
m_t	-1.822875	-1.198628	NS
g_{ct}	-3.031404*	-1.228432	S
y_{wt}	-0.600889	0.299005	NS
x_{pt}	-1.617423	0.244112	NS
y_{t-1}	-1.114775	0.118244	NS
k_t	-5.078765	-5.07865*	S
Critical values at 5%	-2.971853	-1.953381	
First difference			
Y_t	-2.992804*	-1.570761	S
l_t	-6.542899*	-6.411817*	S
x_t	-3.879380*	-3.960745*	S
m_t	-3.769796*	-3.291131*	S
y_{wt}	-4.605489*	-4.616783*	S
x_{pt}	-2.303010	-1.606305	NS
y_{t-1}	-2.933915	-1.568277	NS
Critical values at 5%	-2.971853	-1.953381	
Second difference			
y_{t-1}	-3.384582*	-2.985332*	S
x_{pt}	-3.911011*	-2.654185*	S
Critical value at 5%	-2.981038	-1.953381	

a = Augmented dickey-Fuller test statistics.
b = Dickey-Fuller test statistics
* = Statistically significant at 0.05 level.
S = Stationary, NS = Non-stationary,
Source: Author's Computation

Table 3: Unit root test for Gambia

Series	ADF statistics with constant[a]	DF-GLS[b] statistic with constant	S/NS
Y	-1.168022	0.889315	NS
l_t	0.667926	-1.024512	NS
x_t	-1.720716	-1.511763	NS
x_{mt}	-1.819855	-1.762540	NS
m_t	-4.935408*	-5.020472*	S
g_{ct}	-2.088058	-1.384008	NS
y_{wt}	-0.600889	0.299005	NS
x_{pt}	-2.431201	-1.213115	NS
y_{t-1}	-0.489290	0.279738	NS
k_t	-5.859875	-5.728161	S
Critical values at 5%	-2.957110	-1.951687	
First difference			
Y	-5.198265*	-3.520100*	S
l_t	-6.408671*	-5.667711*	S
x_t	-5.541143*	-3.795924*	S
x_{mt}	-8.370353*	-8.506191*	S
g_{ct}	-3.091798*	-3.110981*	S
y_{wt}	-4.605489*	-4.616783*	S
x_{pt}	-2.771331	-1.611202	S
y_{t-1}	-5.210909*	-3.980426*	S
Critical values at 5%	-2.960411	-1.952066	

a = Augmented dickey-fuller test statistics.
b = Dickey-Fuller test statistics
* = statistically significant at 0.05 level.
S = stationary, NS = Non-stationary
Source: Data Analysis

tests for stationarity indicate that the following series are integrated of order 1 for Nigeria labour force, aggregate export, manufacturing export, import, government sector consumption, world GDP, primary export, the GDP of

Table 4: Unit root test for sierra leone

Series	ADF statistics with constant[a]	DF-GLS[b] statistic with constant	S/NS
Y_t	1.786205	-1.513734	NS
l_t	0.913426	0.695498	NS
x_t	-2.035086	-1.291567	N
m_t	-1.463143	-1.087166	NS
g_{ct}	-3.110639	-3.135505	S
y_{wt}	-0.691012	0.317938	NS
y_{t-1}	-1.388662	-0.689828	NS
Critical values at 5%	-3.081002	-1.957204	
First difference			
y_t	-0.114321	-0.618548	NS
l_t	-6.512031*	-0.252811	S
x_t	0.830491	-0.914247	NS
m_t	-5.066620*	-5.059083	S
y_{wt}	-4.730786*	-4.872852	S
y_{t-1}	-5.735649*	-5.499608	S
Critical values at 5%	-3.081002	-1.959071	
Second difference			
Y_t	-4.552151	0.521488	S
X_t	-5.591562	0.909414	S
Critical value at 5%	-3.1199810	-1.964418	

a = Augmented dickey-fuller test statistics.
b = Dickey-fuller test statistics
* = Statistically significant at 0.05 level.
S = Stationary, NS = Non-stationary,
Source: Data Analysis

previous year. For Ghana the series are GDP, labour force, aggregate export, import and world GDP. Also, for Gambia the series are labour force, aggregate export, manufactured export, government consumption in the GDP, world GDP, GDP, primary export and GDP for previous years, while for Sierra Leone the series are labour force, aggregate export, import, world GDP and GDP for the previous year. The univariate analysis of the nonstationary series indicates that these variables can be characterized as I (1) processes. GDP is integrated of order two, I (2) in Nigeria, however, Gross Capital Formation is integrated of order zero for stationary in Nigeria; but for Ghana, Gross Capital Formation and Manufactured Export are stationary at the level form. In Sierra Leone, the government consumption in the GDP is stationary at the level form; while in Gambia both the Gross capital formation and import are stationary at the level form. The unit Root test shows that some of the series in all the countries demonstrate random walk stochastic processes, we then test whether the linear combination of these variables might be stationary, that is, we find out if the regression residuals are cointegrated.

Table 5 is summary of result of cointegration analysis using the Johansen maximum likelihood approach based on the trace of the stochastic matrix and maximum eigenvalue. The trace tests and the maximum engenvalue indicate five cointegrating vectors for Nigeria and Ghana. For Gambia and Sierra Leone the cointegrating vectors are four each.

Table 5: Cointegration trace (likelihood ratio) tests

Null	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	r ≤ 5	r ≤ 6	r ≤ 7
Alternative	r ≥ 1	r ≥ 2	r ≥ 3	r ≥ 4	r ≥ 5	r ≤ 6	r ≥ 7	r ≥ 8
Nigeria	368.6374	250.0570	166.0632	114.3497	71.91955	42.51200	21.16707	9.705528
	(192.89)	(156.00)	(124.24)	(94.15)	(68.52)	(47.21)	(29.68)	(15.41)
Ghana	310.5697	203.1808	131.1977	86.12072	50.25701	27.38536	11.50773	2.35182
	(156.00)	(124.24)	(94.15)	(68.52)	(47.21)	(29.68)	(15.41)	(3.76)
Gambia	273.1094	197.1310	131.0411	77.17971	41.30027	22.54847	5.435556	0.03624
	(156.00)	(124.24)	(94.15)	(68.52)	(47.21)	(29.68)	(15.41)	(3.76)
Sierra Leone	140.9363	80.65640	50.97575	30.10729	13.0086	0.754635	NA	NA
	94.15	68.52	47.21	29.68	15.41	3.76		

Note: Critical values at the 95% level are in parentheses lag were determined using the Schwarz Bayesian Criterion (SBC). * Indicates that the test statistics is significant at the 5% level, Source: Data analysis

Table 6: Error correction model for the economic growth model

Variable	Nigeria coefficient	Ghana coefficient	Gambia coefficient	Sierra leone coefficient
C	1.154	0.9232	1.1003	0.9972
Δk_t	0.251	0.476	0.401	
Δl_t	0.04	0.072	0.120	0.168
Δx_t	0.124	0.381	0.310	0.0188
Δx_{pt}	0.227		0.032	
Δx_{mt}	-0.117		0.033	
Δm_t	-0.571	-0.321	-0.112	-0.63
Δg_{ct}	-0.012	-0.117	-0.534	-0.27
Δy_{t-1}	0.322	0.432	0.024	0.412
Δy_{wt}	0.007	0.178	0.326	0.0144
e_{t-1}	-0.68			
u_{t-1}		-0.57		
v_{t-1}			-0.41	
w_{t-1}				-0.51
R^2	0.72	0.62	0.55	0.60

Source: Data analysis

Based on these cointegrating vectors in each of the countries, there is a long-term equilibrium relationship for each country. To be able to correct for the error between the short run and long run periods the error correction mechanism was used. The results were shown on Ttable 6. From Table 6 the error-correction terms e_{t-1}, U_{t-1}, V_{t-1} and W_{t-1} for Nigeria, Ghana, Gambia and Sierra Leone respective, have negative coefficients of the error correction term, that is, the estimated error terms have statistically significant negative sign. This ensures that the long-run equilibrium is achieved. However, the adjustment toward equilibrium is not instantaneous. Only 68, 57, 41 and 51% of any year's deviation from the equilibrium are corrected in the series fitted into the error correction models for Nigeria, Ghana, Gambia and Nigeria, respectively.

The model shown in Eq. 3 was estimated by OLS for each country that is Nigeria, Ghana, Gambia and Sierra Leone. First we estimated the model for Nigeria, which include all the variables. The results show that most of the variables have correct signs as predicted by theory.

For instance capital, aggregate export, primary export, government consumption, GDP for previous year and world GDP have positive relationship with growth. Meaning that an increase in any of these variables will lead to increase in growth. The labour force coefficient is negative and significant. This may be as a result of the continual increase in the level of unemployment in Nigeria and because Nigeria economy is a monoculture economy where agricultural sector, which happened to be the largest employer of labour, has been neglected. Also important is the positive coefficient for the world GDP. This means that Nigeria is actually linked with the outside world. The R^2 is 0.96 (96%) meaning that the explanatory variables fitted into the model was able to explain 96% of the total systematic variation of the economic growth in Nigeria for the period captured in the study. The Durbin-Watson test of 1.96 is very near to 2 showing that there is no problem of serial correlation. The value of the F statistics shows that the overall regression is significant.

Since the impact of export on growth is the major focus of the study, effort was made to look at this. Result shows that with a 1% change in aggregate export and primary export and, growth gets change with 0.236 and 2.27%, respectively. Meaning that massive export will lead to massive growth in the economy because of development of domestic industries through a transmission mechanism of high sales turnover.

The result for Ghana indicated that some of the variables have positive sign that accord theory. These variables include capital, aggregate export, primary export, import, government consumption, GDP for previous year and the world GDP Table 7. Also important is the positive sign of the import coefficient. This might have been that most of the items imported to Ghana are raw materials, machine and technology that are further used for production that add to economic growth. All the estimates are statistically significant. The R^2 shows that the variables captured in the model were able to explain 84% of the total variation in economic growth. The Durbin- Watson also shows that there is no problem of serial correlation.

The result for the Gambia shows that the coefficient for labour force, manufactured export and import are all negative. The reason why the coefficient of manufactured export is negative might not be unconnected with the

Table 7: Long run regression results where dependent variable is real gdp (y_t)

Variable	Nigeria coefficient	Ghana coefficient	Gambia coefficient	Sierra leone coefficient
Regressors				
k_t = Capital	0.0027	0.0143	-0.0018	
	(0.001)	(0.0001)	(0.218)	
l_t = Labour force	-0.668	-0.118	-0.0094	-1.669
	(0.212)	(0.03)	(0.001)	(0.514)
x_t = Aggregate export	0.236	0.084	0.087	0.13754
	(0.101)	(0.007)	(0.004)	(0.124)
x_{pt} = Primary export	2.278	1.432	0.231	
	(0.371)	(0.423)	(0.821)	
x_{mt} = Manufactured	-0.015	-0.0046	-0.00069	
	(0.006)	(0.001)	(0.021)	
m_t = Import	-0.0007	0.056	-0.0019	-0.04516
	(0.014)	(0.046)	(0.0001)	(0.1471)
g_{ct} = Government consumption	0.010	0.216	0.0058	0.0248
	(0.002)	(0.010)	(0.02)	(0.0033)
y_{t-1} = GDP for previous year	0.358	0.468	0.608	-0.561
	(0.117)	0.002	(0.220)	(0.328)
y_{wt} = world GDP	0.278	0.445	0.3987	0.5611
	(0.079)	(0.119)	(0.420)	0.0271
Constant	1.8212	1.1772	2.452	1.4977
	(0.412)	(0.032)	(-0.32)	(0.2477)
R^2	0.96	0.84	0.91	0.68
DW	1.96	1.78	1.85	1.72

Note: The values in bracket below the coefficients are the standard error, Source: Data analysis

dependence of Gambia economy purely on the export of primary products. All variables are statistically significant at 5% with the exception of world GDP which is though positive but not significant. The R^2 was 91% meaning that the explanatory variables explain 91% of the total systematic variation in the economic growth. The aggregate export coefficient shows that there is positive relationship between economic growth and aggregate export and that a one percent change of aggregate export lead to 0.087% change in economic growth.

For Sierra Leone, result shows that the coefficients for labour force, manufactured export and the world GDP are negative. This behaviour is against economic theory and why it is so is subject to investigation. Every other variable fitted into the model carry positive sign. Aggregate export coefficient for this country is positive. The result indicates that a 1% change in aggregate export lead to 0.13754% change in economic growth.

CONCLUSION

The following are possible areas of intervention that will trigger off economic development in WAMZ countries of the ECOWAS countries.

Since export is the major focus of this study, the positive and significant coefficient of aggregate export in all the four countries confirms the results from the statistical data that export is the engine of growth in ECOWAS state. This simply means that for economic growth to take place these countries must embark on massive export. One set of surprising results is related to the negative coefficient for manufactured export in all the countries. This indicate that the economy of these countries still depend majorly on primary production. Less of the primary products are processed in the region and therefore the negative impact of manufactured export on economic growth. Furthermore, this implies that a critical level of economic development is required for manufactured exports to have a positive and significant impact on WAMZ countries in the ECOWAS economic growth. Again, since this result has important implications for the impacts of manufactured export and trade policies, it needs to be assessed carefully. The reliability of the estimates can be seen from the fact that the range is relatively robust among the countries. The result in this study also shows that import growth hinders economics growth. Therefore, for any of the countries in this region, materials or goods to be imported should be majorly what can be used to further production for export.

In conclusion, the study shows that the aggregate export contribute positively to economic growth. However, the value of the coefficient of aggregate export for all the countries is low. Therefore, an improvement in export is advocated to put the nation on the right track of development. Improvement in export is an important yardstick for measuring the economic growth. Suffice it to say that an increase in export is a required engine for growth and economic development in the ECOWAS countries.

The policy implication that can be drawn from the outcome of our analysis is that the government of the WAMZ countries of the ECOWAS is not doing enough to stimulate economic growth in their economies. Thus, their trade policies have not produced desirable robust solution to boost economic growth. A solution could emerge if accurate export drive is put in place and also for import to be redirected.

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