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**International Development Assistance and Educational Development in  
ECOWAS**

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**Abstract**

*The World Bank puts the number of poor persons in Africa, based on the international poverty line of US\$1.90 per person per day, 2013 at 389 million, a figure that is more than the number of poor persons in all other regions of the world combined (World Bank, 2016). Some researchers believe that international development assistance has a positive impact in reducing the high rate of poverty. Human capital development is seen as a key economic variable required in achieving the desired improvement in the standard of living of people living in developing countries. Consequently, this paper narrows the foreign-aid led growth discourse by investigating the relationship between international development assistance and educational development in countries of the Economic Community of West African States (ECOWAS) using panel data from 14 ECOWAS countries for the period 1974 to 2014 (a period of 41 years). The findings were that, though the average ratio of official development assistance (ODA) to GDP is 15.2 percent of the ECOWAS sub-region during the period, which is high, its impact on educational development was significant but negative. This may be attributed to the wrong application of ODA by the receiving countries or their non-application to the education sector of the economy or to the type of ODA received.*

**Keywords:** Official Development Assistance, Foreign Aids, Educational Development, ECOWAS, Poverty.



## **1.0 Introduction**

International development assistance (IDA) refers to financial aids provided by developed countries and international multilateral institutions to support the economic, environmental, educational, social and political development efforts of developing countries. The long-run aim is to drastically reduce poverty and improve the economic development and well-being of the large proportion of the world's population that live in developing countries.

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Donor countries also target a more equitable and balanced global development in accordance with the Millennium Development Goals (MDGs). The effects of unequal and lopsided development pose a moral question for the rich advanced countries and threaten peace, stability, and security in the world.

In the literature, international development assistance is used synonymously with development aid, foreign aid, international aid, overseas aid, official development assistance (ODA), amongst others. ODA is aids from governments of wealthy nations directed at promoting development in developing countries. Records of official development assistance in the world are compiled by the Development Assistance Committee (DAC) of the Organization of Economic Co-operation and Development (OECD) since 1969. The top ten DAC donor countries as at 2013 are the European Union, United States, United Kingdom, Germany, Japan, France, Sweden, Norway, Netherlands, Canada and Australia (OECD, 2014).

Africa and sub-Saharan Africa, in particular, constitute one of the primary recipients of international development assistance. Generally, African countries face the challenge of inadequate domestic resources needed to finance their economies (Rodriguez, 2013). The result has been widespread poverty characterized by high rates of inflation and unemployment, and

low per capita income and human capital development for many countries in sub-Saharan Africa. More than one of every four Africans is undernourished, and food insecurity is commonplace especially in sub-Saharan Africa (UNDP, 2012). The situation is compounded by conflicts in many countries leading to over 3 million refugees and almost 7 million internally displaced persons further posing serious bottlenecks to educational progress in the region (UNHCR, 2012).

It is based on the above scenario that many developed nations and international institutions like the World Bank, United Nations, United Nations International Children's Emergency Fund (UNICEF), Organization of Economic Co-operation and Development (OECD) have continuously offered IDA and development programs to improve the welfare of people living in developing countries. IDA programs are seen as having the capacity to build the economic infrastructure that can support development and industrialization in recipient countries (Billet, 1991).

Asher (1966) listed the justification for aid programs to include rehabilitation and reconstruction of the economies of war-ravaged countries, strengthening and subsidizing the military capacity of less developed nations as well as the promotion of their economic growth and political stability.

At the United Nations (UN) General Assembly in 1970, the world's rich countries agreed to give 0.7 percent of their Gross National Product (GNP) at market prices as official development assistance to developing nations.

Since this target was set over forty-five (45) years ago, development assistance has continued to flow to the economies of nations considered economically backward including the Economic Community of West African Countries (ECOWAS). This has created some level of dependency on development assistance. On the average, the quantum of foreign aid as a

percentage of Gross Domestic Product (GDP) for countries in sub-Saharan Africa is more than four times that of countries in other regions of the World (Adom, 2012).

Three ECOWAS countries namely Nigeria, Cote d'Ivoire and Ghana are among the top 10 ODA recipients in Africa. The countries got a three-year average (2011 – 2013) net ODA receipts of \$2,071 million, \$1,778 million and \$1,650 respectively representing 10 percent of total ODA to Africa within the period ( DAC-OECD, 2015). More aids continue to flow into Africa annually.

On December 13, 2016, ECOWAS and the United States Government signed a certificate of recognition in attestation of the multi-year Development Agreement between the two institutions which was originally signed on November 12, 2015. Under the agreement signed by the President of the ECOWAS Commission and the U.S. Agency for International Development (USAID), the U.S. Government would provide \$221 million over a five year period of 2015 to 2019 to strengthen democratic institutions enhance economic growth, trade and investment as well as increase opportunities in health, and education sectors.

## **2.0 ECOWAS, Foreign Aid, and Educational Development**

ECOWAS was founded on 28 May 1975, with the signing of the Treaty of Lagos by fifteen-member states with the broad mission of promoting economic integration across the region. The fifteen-member states are Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. ECOWAS is meant to foster collective self-sufficiency and interstate economic and political cooperation.

The population of ECOWAS has grown in the past few years, increasing from 70 million to about 300 million people between 1950 and 2010. As at 2014, the population of the sub-region represented about 40 percent of the population of sub-Saharan Africa (ECOWAS

Commission). ECOWAS poverty profiles reveal high poverty rates in many of the countries with declining trends recorded in some cases. Most of the poor live in rural areas, have little or no education and are engaged mainly in small-scale agriculture.

From inception, ECOWAS recognized the importance of education and training in imparting employable skills youths in the sub-region. Educational development and indeed human capital development is a key success factor for the economic advancement of any nation. It is in this regard that the ECOWAS Commission has continuously sponsored programmes to increase human capital development in the sub-region. Recently, the Commission organized a number of capacity building session in member states for the development and revision of Technical and Vocational Education and Training (TVET) curriculum and instructional materials.

Similarly, over the years, the United Nations has set up various programs to increase the pace of educational development especially primary education in developing countries. This was clearly emphasized in the Millennium Development Goals (MDGs). The second goal is directed at ensuring that by the year 2015, children everywhere are able to complete a full course of primary education (United Nations, 2000)

Still on the drive to enhance educational development especially in developing economies, The World Education Forum met in Dakar, Senegal in 2000 and identified six goals to be achieved by the year 2015. The international community pledged in that meeting that “no country shall be thwarted from meeting the [Education for All (EFA)] goals due to lack of resources” (Education for All Forum, 2000). Since then, national governments, international organizations and various stakeholders have been making concerted efforts to address the gap in resources which are required to reach these goals (UNESCO Institute for Statistics, 2011).

It is not surprising therefore that in the past decade, there has been a substantial increase in the amounts of foreign aid that goes into supporting primary education (Asiedu, 2014). Over



the past ten years, real expenditure on education has increased by 6 percent annually in sub-Saharan Africa. Recent data show that many countries in the region have also made significant investments to improve their educational development. In Burundi and Mozambique, for example, expenditure levels rose by an average of 12 percent each year. Out of 26 countries with available data, only one country, the Central African Republic, reduced spending on education. The number of children in primary schooling has increased by 48 per cent from 87 million to 129 million between 2000 and 2008. Enrolment in pre-primary, secondary and tertiary education has also grown by more than 60 percent during the same period” (UNESCO Institute for Statistics, 2011).

## **2.1 Literature Review**

While there is a lot of literature on the foreign aid-led growth theory as it applies to Africa, not much has been written on the subject relating to ECOWAS. There is equally a dearth of empirical literature on the nexus between international development assistance (IDA) and educational development in the ECOWAS sub-region.

Asiedu (2014) analyzed data from 38 countries in sub-Saharan Africa for the period 1990 to 2004 in an attempt to answer the question whether foreign aids in education have a significant effect on growth in sub-Saharan Africa. She controlled for initial per capita income, inflation, investment, government consumption, openness to trade and institutional quality. She found that aid in primary education has a positive and significant effect on growth, aid in post-primary education has no significant impact on growth and that growth increases as the aid in primary education as a share of total education aid increases.

Eregha and Oziegbe (2016) examined the effectiveness of official development assistance (ODA) on per capita GDP growth for the different regions in sub-Sahara Africa. They found that ODA has a positive and insignificant effect on West Africa, East Africa, and

non-oil exporting countries but the effect was positive and significant for South Africa, Central Africa, and Oil exporting countries. For West Africa, the effect became significant on per capita growth only when Macroeconomic policy environment variables are captured.

Abdul-Nasser and Manuchehr (2005) investigated the dynamic relationship between foreign aid and economic growth for a panel of developing countries (Botswana, Ethiopia, India, Kenya, Sri-Lanka, and Tanzania) over the period 1974-1996. Their finding was that foreign aid has a positive and significant effect on economic activity for each country in the sample. The study further revealed that foreign capital flows can have a favourable effect on real income by supporting domestic savings.

## **4.0 THEORETICAL FRAMEWORK AND METHODOLOGY**

### **4.1 Theoretical Framework**

The theoretical foundation for the proposition that aid can promote economic development was entrenched in the 2-gap model. The model posits that development may be hampered by the existence of the savings gap and foreign exchange gap in the developing countries. The savings gap as espoused arises from the fact that domestic savings tend to be low and as a result fall short of required investment while foreign exchange gap arises from the fact that most developing countries run import surpluses or balance of payment deficit due to extreme dependence on primary commodity exports, exports instability and internationally transmitted shocks (Iyoha, 2004). Thus, these gaps can be filled by foreign savings in the form of aid flow. However, the practical impact of aid flow to augment these gaps in achieving growth and development of developing countries have not materialized the expected outcomes and this has questioned the place of aid flow in developing countries. In relation to educational development, this model can be extended into a growth analysis.

The theoretical framework in this study, therefore, operationalises the Neoclassical Solow-Model of a small, open economy within an augmented financial gap model. This allows

a simultaneous analysis of the interactions between sectoral development/growth and foreign aid dynamics.

Given a neoclassical production function of the form:

$$Y = K^\alpha L^{1-\alpha}$$

( $0 < \alpha < 1$ ), K: physical capital stock, L: labor input (1)

and the per capita version of the form:

$$y = \frac{Y}{L} = \left(\frac{K}{L}\right)^\alpha = k^\alpha \quad \text{capital-labour ratio}$$

GDP (or its components) grows at a rate of

$$\delta Y = \alpha \delta K + (1 - \alpha) \delta L \quad (2)$$

Where  $\delta$  indicates the rate of change. From the neoclassical assumptions, the growth equation yields:

$$\delta y = \delta Y - n = \alpha(\delta K - n) = \alpha \delta k \quad (3)$$

The rate of growth of the capital stock is determined by the investment ratio and the capital-output ratio ( $v \equiv K/Y$ ):

$$\delta k = \frac{\delta K}{K} - \frac{\delta L}{L} = \frac{\delta K}{K} - n = \frac{\delta K}{K} - n \quad (4)$$

The capital-output ratio is an increasing function of the capital-labour ratio,  $v$ :

$$v = \frac{K}{Y} = \left(\frac{K}{L}\right)^{\frac{1}{1-\alpha}} = k^{\frac{1}{1-\alpha}}$$

In the two-gap analysis, investment ratio ( $I/Y$ ) is proposed to be given as:

$$\frac{I}{Y} = s + kim = s + pb \quad (5)$$

Where  $s$  is domestic savings ratio,  $kim$  is the capital import to GDP ratio, and  $pb$  is primary trade balance to GDP ratio. Substituting (5) into (4) gives,

$$\delta k = \frac{s + pb}{k} = (s + pb) k^{-(1-\alpha)} \quad (6)$$

And therefore,

$$\Delta k = \delta + \alpha \left[ \frac{\Delta k + \Delta s}{\delta} - k \right] \quad (7)$$

$$= \delta + \alpha [(k + \Delta k) \delta^{-1} - k] \quad (8)$$

The formulation in (8) demonstrates that the rates of growth of capital stock and GDP will rise, whenever the capital-labour ratio decreases or when the aid to GDP ratio increases. Therefore, an increase in the capital import ratio ( $\Delta kim$ ) has a rich positive effect on economic growth in all sectors as much as an increased savings ratio (i.e.,  $\Delta s = \Delta kim$ ).

## 4.2 Model Specification

The model specified in this study is based on the theoretical framework presented. In the model, it is hypothesized that educational development is directly linked to aid inflows into a country. In this study, educational development is measured as the secondary school enrolment ratio (*edu*). This is an educational outcome measure that has been used to represent educational development in many studies, including Asiedu and Nandwa (2009), Dreher Nunnenkamp and Thiele (2006), and Elsa-Sofia (2010). International development assistance is taken as the total book value of the assistance flowing into a country in a year. The variable is measured as a ratio of GDP in order to provide a stable measure for each of the countries in the study. Other variables that explain educational development are included in the model such as per capita income levels (*pcy*), government expenditure as a ratio of GDP (*gexyr*) and the level of capital investment as a ratio of GDP (*invyr*). Note that the role of investment in the two-gap model is critical. Since African economies are greatly influenced by external factors, the level of openness of the economies is included in cross-country analysis. Hence, in our model, trade openness (*open*) is included as well as a measure of the economic environment in the country. This variable explains to what extent trade performs well in a developing country (see Eregha & Oziegbe, 2016). The functional form of the model is therefore specified as:



$$ODAYR = f(EDU, PCY, GEXYR, INVYR, OPEN, INFL) \quad (9)$$

Where ODAYR = official development assistance to GDP ratio

EDU = educational development

PCY = per capita GDP

GEXYR = government expenditure to GDP ratio

INVYR = investment to GDP ratio

OPEN = trade openness

INFL = inflation rate to measure the economic environment in a country

The econometric form of the model would take a panel regression form which assumes cross-sectional heterogeneity (Cross section effect) and period heterogeneity (Time effect). In specifying the panel regression model, cross sections (West African countries) and year dummies (1974-2014) are included. This will ensure that biases due to heterogeneity in the data set are minimized. The panel multiple regression model with an error term ( $\varepsilon_t$ ) is specified in econometric form as;

$$ODAYR_{it} = \alpha_0 + \alpha_1 EDU_{it} + \alpha_2 PCY_{it} + \alpha_3 GEXYR_{it} + \alpha_4 INVYR_{it} + \alpha_5 OPEN_{it} + \alpha_6 INFL_{it} + X_{it}'\beta_i + \omega_i + \eta_t + \varepsilon_{it} \quad (10)$$

Where  $\omega_i$  = variances across countries but not over time (cross or random effect)

$\eta_t$  = variances over time but not across countries at any given time (fixed effect)

$\varepsilon_{it}$  = error terms over the cross-section and time

$i$  = individual countries

$t$  = time

The expected a priori signs for the model are that ODA, PCY, GEX, INV, and OPEN should have positive impacts on educational development. On the other hand, inflationary

pressure is expected to exert a negative impact on educational development among the countries in the ECOWAS sub-region.

### **4.3 Method of Data Analysis**

Generally, there are many differences, both institutional, policy and macroeconomic environments that characterize countries in the ECOWAS region. Consequently, it is likely that the analysis of the relationship between aid inflows and educational development without considering such differences, no doubt, would impair our generalization and even our estimation process. On this note, the panel data analysis method is preferred as it considers the cross-sectional and time-series characteristics of the sample data. In essence, the panel data analysis accommodates 'time as well as the heterogeneity' effects of the countries.

In all, the panel data analysis captures the aforementioned characteristics by including the individual country's specific effects which may be random or fixed. Moreover, the fixed effects model could be costly in degrees of freedom because it is equivalent to the use of a dummy variable for every country. The random effects model, on the other hand, assumes the independence between the error term and the independent variables. In any case, we would use the *Hausman test* to select between fixed and random panel estimation techniques. However, for ease of comparison, the simple pooled ordinary least square (OLS), as well as the fixed and random effects regression models, would be adopted in this study.

Another strong issue in the study is to which direction foreign aid and educational development move. This analysis is conducted based on the Granger Causality testing methodology. In panel analysis, recent derivations could be adopted to perform panel data specific causality testing. In these settings, least squares regressions can take a number of different forms, depending upon assumptions made about the structure of the panel data. There are a number of different approaches to testing for Granger Causality in a panel context. In general however, the bivariate regressions in a panel data context take the form:

$$y_{i,t} = \alpha_{0,i} + \alpha_{1,i}y_{i,t-1} + \dots + \alpha_{l,i}y_{i,t-l} + \beta_{1,i}x_{i,t-1} + \dots + \beta_{l,i}x_{i,t-l} + \epsilon_{i,t}$$

$$x_{i,t} = \alpha_{0,i} + \alpha_{1,i}x_{i,t-1} + \dots + \alpha_{l,i}x_{i,t-l} + \beta_{1,i}y_{i,t-1} + \dots + \beta_{l,i}y_{i,t-l} + \epsilon_{i,t}$$

Where  $t$  denotes the time period dimension of the panel, and  $i$  denotes the cross-sectional dimension.

Usually, different forms of panel causality test differ on the assumptions made about the homogeneity of the coefficients across cross-sections. In this study, we adopt the approach proposed by Dumitrescu-Hurlin (2012), which makes assumption allowing all coefficients in the equations to be different across cross-sections:

$$\alpha_{0,i} \neq \alpha_{0,j}, \alpha_{1,i} \neq \alpha_{1,j}, \dots, \alpha_{l,i} \neq \alpha_{l,j}, \forall i, j$$

$$\beta_{1,i} \neq \beta_{1,j}, \dots, \beta_{l,i} \neq \beta_{l,j}, \forall i, j$$

This test is calculated by simply running standard Granger Causality regressions for each cross-section individually. The next step is to take the average of the test statistics, which are termed the W-bar statistic. They show that the standardized version of this statistic, appropriately weighted in unbalanced panels, follows a standard normal distribution. This is termed the Z-bar statistic.

#### **4.4 The Data**

As shown in the previous sections, data used in this study are panel data. This indicates a combination of time series and cross-sectional data. In the study, 14 ECOWAS countries (for which complete data are available) are selected from 1974 to 2014 (a period of 41 years). The countries used in the analysis include Nigeria, Niger, Ghana, Mali, Guinea, Chad, Burkina Faso, Cameroun, Senegal, Sierra Leone, Liberia, Togo, Benin, and the Gambia. All the data were obtained from the World Bank *World Development Indicators* database (2016).

#### **4.0 Empirical Analysis and Discussion**

The empirical analysis in this section involves primarily the presentation and interpretation of the data used in the analysis. In this regard, two analytical procedures are

adopted, namely, statistical analysis and econometric analysis. In the statistical analysis, the initial characterization of the data is presented while the econometric analysis consolidates on the statistical analysis by providing empirical relationships from which inferences can be drawn.

#### 4.1 Analysis of Summary Statistics

In order to provide a wider outlook for the data set, we report the descriptive statistics for the combined data in Table 1. These results also include the second moment characteristics of the data that may provide information on the use of panel data analysis technique in this study. The table shows that on average, secondary school enrolment ratio in the ECOWAS region was 62.4 percent for the period in the study. This is generally low and indicates that secondary school access and, indeed, entire educational development in the region still has some work to be done. The maximum and minimum values of the ratio, however, suggest that there is a wide gap among some countries in terms of enrolment rates in the region. The high standard deviation value also confirms this while the low skewness value for the EDU variable shows that most of the country averages are around the mean value. The J-B value is very high and it passes the significance test at the 1 percent level, which indicates that the density function of the series is non-normally distributed.

For the ODA variable, the average ratio to GDP is 15.2 percent, which is high. This shows that for some countries in the region, foreign aid forms a large proportion of their overall income. The extreme values indicate that some countries have as much as 55 percent of their GDP in foreign aid while others (like Nigeria in some years) have quite negligible contributions to GDP from ODA inflows. The J-B value for ODA inflows is very high and significant, showing that there is heterogeneity among the data for the series.

**Table 1: Descriptive Statistics**

<i>Variable</i>	<i>Mean</i>	<i>Max</i>	<i>Min</i>	<i>Std. Dev.</i>	<i>Skew</i>	<i>Kurt</i>	<i>J-B</i>	<i>Observations</i>
-----------------	-------------	------------	------------	------------------	-------------	-------------	------------	---------------------



<i>EDU</i>	62.4	98.2	32.0	28.36	0.25	2.10	25.18	572
<i>ODAYR</i>	15.73	55.2	0	14.82	4.23	32.57	22539.1	572
<i>PCY</i>	419.18	1448.7	45.75	250.56	1.23	4.40	191.7	572
<i>GEXYR</i>	67.2	107.4	10.9	161.60	8.27	101.45	237518	572
<i>INVYR</i>	17.26	57	5	7.72	1.65	8.43	961.1	572
<i>OPEN</i>	61.28	146	23	22.43	0.93	3.89	101.43	572
<i>INFL</i>	11.69	166	-13	17.39	3.85	25.14	13096.85	572

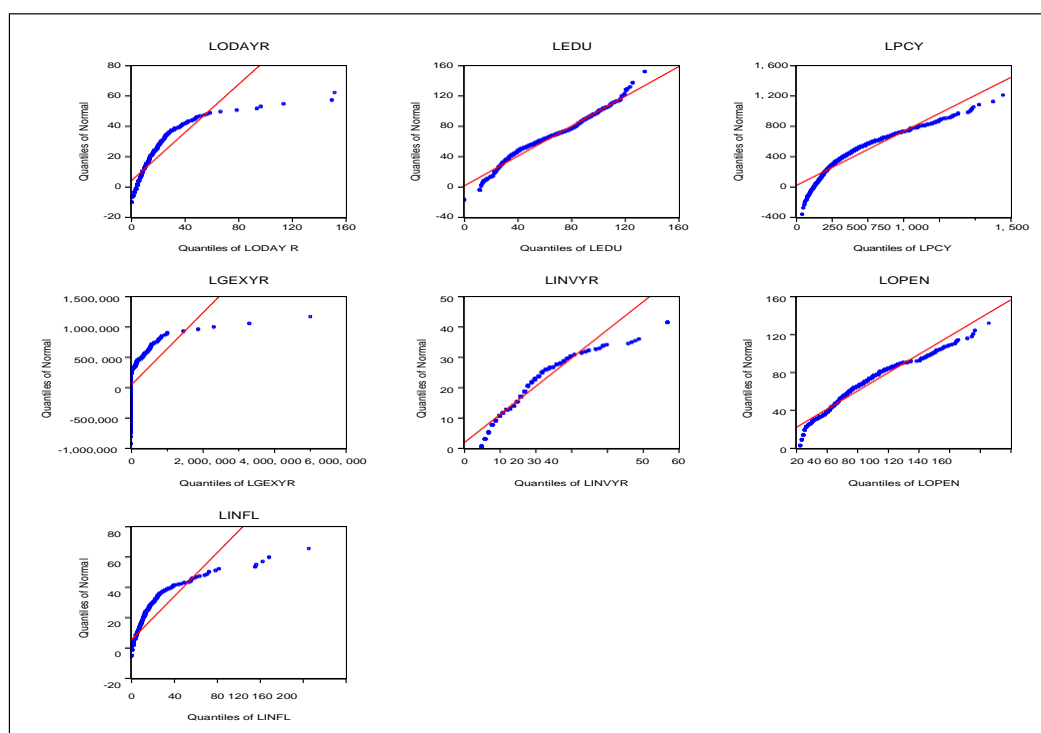
The average income per capita value is \$419.18 for the period which is a relatively low value. However, as with the economic growth rate, the per capita income level is highly variable both across the sections in the study (country groups) and over time for each of the countries. This result is demonstrated by the high standard deviation value of 1657.8 The skewness is also highly positive at 6.06 and indicates that the per capita income figures for most of the countries lie to the left of (are less than) the mean value. The kurtosis value is extremely high at and indicates the presence of extreme values which may generate heteroskedastic variations in the data. The data set is highly leptokurtic and shows that extreme outliers in the per capita income values may generate heterogeneity issues in the analysis.

The J-B value for all the series indicates that the series are not normally distributed. This is also the case for all the other variables in the sample for this study. This outcome clearly shows that the use of panel data analysis procedure for the estimation of the relationships in this study stems from heterogeneity in per all the data series.

We further test for the distribution patterns of the density functions for the residual in the data for the study since the aim of the study is to examine estimate a panel data model. One way of examining the distribution of the residuals in data series is to plot the quantiles. The quantiles in this study are plotted using the Quantile-Quantile (Q-Q) theoretic plot and are shown in Figure 1 below. If the residuals are normally distributed, the points in the QQ-plots should lie alongside a straight line. In the chart, only the plot for the enrolment variable seems

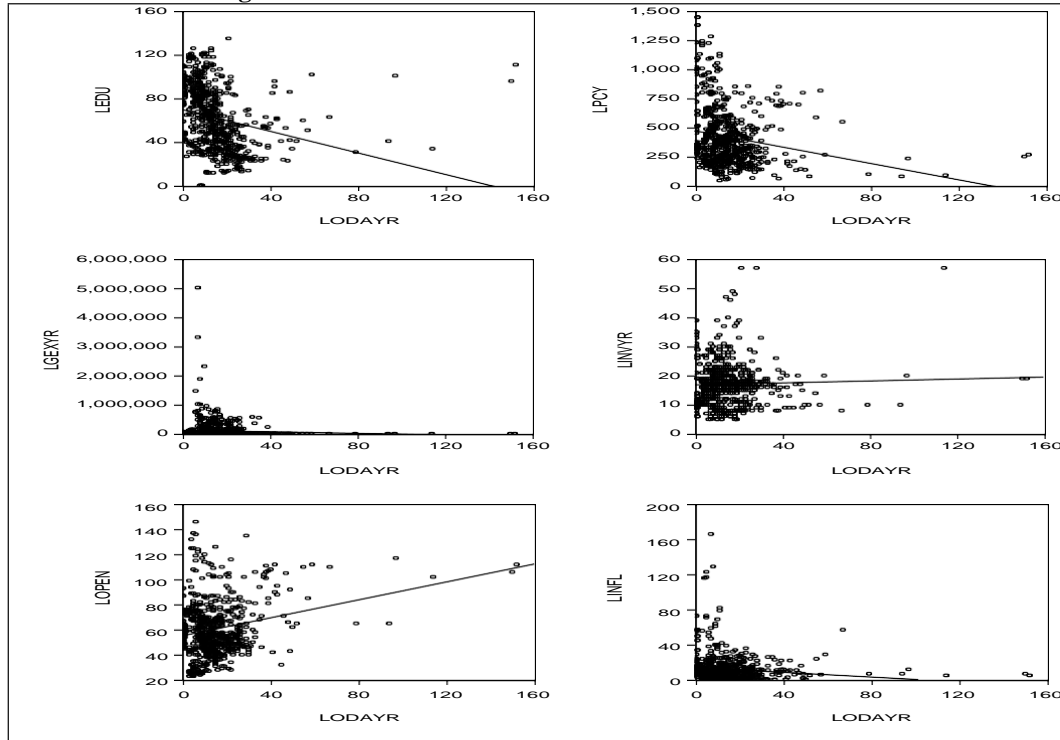
to lie along the line for the entire period. For all the other plots, the tails and the heads lie extensively away from the line. These indicate that basically, both large negative and positive shocks are driving the departure from normality in each of the variables. Also, the results show the presence of outliers among the data set across the countries in the sample. This further confirms the results from the descriptive analysis presented above.

**Fig. 1: The Quantile Charts**



The initial patterns of relationships among the variables are presented in form of unconditional correlation charts shown in Figure 2. These charts show the direction of co-movements among pairs of variables in the analysis. From the chart, it is seen that educational development and ODA inflow have a negative relationship, suggesting that aid inflow moves in opposite direction with educational development. This result is rather interesting since it suggests that in the ECOWAS region, rising aid inflows correspond with falling educational development indicators. In the chart, ODA and per capita income also have a negative relationship. Only trade openness has clear positive correlations with ODA inflows, suggesting that ODA inflows and trade openness move in the same direction among the countries.

**Fig. 2: Correlation Charts for ODAs and other variables**



## 4.2 Causality Tests

The relationship between aid inflow and educational sector performance in the ECOWAS region may actually be bi-directional since educational development is an indicator of human capital improvement in a country, whereas human capital development has been known to attract higher foreign sector participation in a country. Thus, in this section, the pattern of causalities among the variables is reported in Table 3. In the result, both the W-stat and Z-stat values indicate that there is a bi-directional relationship between educational development and ODA ratio. This is demonstrated by the significant values (from the probabilities) for the two null hypotheses on the causality not running in either direction. Thus, it is shown that while educational development responds to ODA inflows in the region, educational development is also a stimulating factor for ODA inflows into the countries of the region.

**Table 2: Panel Causality Test Results**

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
LEDU does not homogeneously cause LODAYR	5.01	4.77	0.00
LODAYR does not homogeneously cause LEDU	3.39	2.09	0.04

LPCY does not homogeneously cause LODAYR	1.60	-0.86	0.39
LODAYR does not homogeneously cause LPCY	1.70	-0.71	0.48
LGEXYR does not homogeneously cause LODAYR	3.32	1.97	0.05
LODAYR does not homogeneously cause LGEXYR	4.50	3.93	0.00
LINVYR does not homogeneously cause LODAYR	2.79	1.11	0.27
LODAYR does not homogeneously cause LINVYR	2.02	-0.17	0.86
LOPEN does not homogeneously cause LODAYR	3.63	2.48	0.01
LODAYR does not homogeneously cause LOPEN	2.53	0.67	0.50
LINFL does not homogeneously cause LODAYR	1.72	-0.66	0.51
LODAYR does not homogeneously cause LINFL	2.25	0.20	0.84
LPCY does not homogeneously cause LEDU	3.41	2.12	0.03
LEDU does not homogeneously cause LPCY	6.92	7.93	0.00
LGEXYR does not homogeneously cause LEDU	4.35	3.69	0.00
LEDU does not homogeneously cause LGEXYR	3.68	2.58	0.01
LINVYR does not homogeneously cause LEDU	2.69	0.94	0.35
LEDU does not homogeneously cause LINVYR	6.10	6.57	0.00
LOPEN does not homogeneously cause LEDU	1.93	-0.33	0.74
LEDU does not homogeneously cause LOPEN	3.37	2.06	0.04

Causality between ODA inflows and per capita income is not significant in either direction, while that of ODA and government expenditure is significant for both null hypotheses. This shows that movements in government spending in the region are affected by ODA inflows and the inflows also respond to government expenditure. The result also shows that causality runs from openness to ODA inflows and not the other way around. Thus, when compared with the correlations analysis, this outcome suggests that the more open an economy is, the higher the ODA inflows into that country.

The test for causalities between educational development and each of the other variables shows that causality runs in either direction between education and per capita income and between educational development and government expenditure. This shows the importance of developing the educational sector in order to boost overall economic development and government revenues (perhaps through higher direct taxes).

#### 4.3 Regression Analysis



The panel data estimation strategy adopted in this section presupposes that the biases in the pooled data could either come from cross-sectional heterogeneity or time series (periodic) variations. Hence, the Hausman test of heterogeneity is initially conducted to determine the best effects model (random or fixed) to be adopted in the analysis. The result of the Hausman test is reported in Table 3. The Chi-square statistic values for the equation is highly significant at the 1 percent level. From these results, the statistic provides little evidence against the null hypothesis that there is no misspecification when the random effect model is employed. Hence, the best method to apply is the Random-effect strategy. In this study, we report both random and fixed effects estimates in order to provide a comparison.

**Table 3: Correlated Random Effects - Hausman Test**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	99.851837	6	0.0000

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LODAYR	-0.343277	-0.313141	0.001113	0.3663
LPCY	0.038098	0.048865	0.000008	0.0001
LGEXYR	-0.000001	0.000006	0.000000	0.0000
LINVYR	0.196635	0.178504	0.000834	0.5302
LOPEN	0.077069	0.048083	0.000098	0.0034
LINFL	0.192232	0.079287	0.000331	0.0000

The results of the estimated equation for the empirical analysis are presented in Table below. In the result, the goodness of fit statistics is generally better for the fixed-effects result compared to those of the random effects. However, the focus of the results and analysis are on the random-effects estimates, based on the Hausman test results. In the result shown in Table 4, the adjusted R squared value is rather low at 0.26, suggesting that just 26 percent of the systematic variations in educational development among the countries in the sample was captured in the model. The low R squared value is however not a major issue in the result since as Iyoha (2004) noted that the coefficient of determination for panel data studies are usually

low due to heterogeneity effects. The F-value for the random effects result is however very high and significant at the 1 percent level, indicating that a significant log-linear relationship exists between educational development and all the independent variables combined.

**Table 4: The Estimation Results**

<i>Variable</i>	<i>Random Effects</i>			<i>Fixed Effects</i>		
	<i>Coefficient</i>	<i>t-Statistic</i>	<i>Prob.</i>	<i>Coefficient</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	38.87	10.48	0	41.25	10.41	0
LODAYR	-0.31	-4.63	0	-0.34	-4.55	0
LPCY	0.05	12.24	0	0.04	7.85	0
LGEXYR	0.01	2.31	0.02	-0.01	-0.28	0.78
LINVYR	0.18	1.44	0.15	0.20	1.54	0.12
LOPEN	0.05	1.11	0.27	0.08	1.74	0.08
LINFL	0.08	1.42	0.16	0.19	3.28	0.00
R-squared		0.27			0.461	
Adjusted R-squared		0.26			0.413	
F-statistic		34.2			9.793	

The individual effects of the explanatory variables on the dependent variable are determined based on the coefficients of the estimates. From the results, the ODA ratio in the model is negative and highly significant at the 1 percent level. This shows that ODA inflows have a significant negative impact on educational development in the region. Rising ODA inflows tend to stiffen the development of the educational sector, especially when it is measured through access. Indeed, from the results, a one percent rise in ODA as a proportion of GDP leads to a fall in educational development by up to 0.31 percentage points. This result, though not congruent with findings larger panel of countries such as Dreher, Nunnenkamp and Thiele (2006) and Michael, Ova and Weber (2006), shows destabilizing effects that aid could have when not properly channeled and managed. Indeed, foreign aid has been known to have weakened the resolve of domestic governments to ensuring quality among institutions. As

Azarnert (2008) noted, foreign aid can work against its stated goals of alleviating poverty and promoting growth. Also, the outcome of this study strongly supports the assertion in Asiedu and Nandwa (2009) that the effects of aid on recipient countries could vary by income as well as by the type of aid. Thus, a more disaggregate aid typology would be essential.

Per capita income and government expenditure both have significant positive impacts on educational development. This shows that rising income levels would guarantee improvements in the educational sector. This could come through higher spending on educational capital and human resources and more ability of parents to send their children to school. Also, the more the governments spend in a country, the greater the development of the educational sector in the region. The coefficients of the other variables fail the significance test at the 5 percent level. This implies that capital investment, trade openness of inflation rates do not affect the pace of educational development in the region.

## **5.0 Conclusion**

The above results reveal that official development assistance (ODA), which on the average contributed 15.2 percent to GDP of the ECOWAS sub-region, did not have a positive impact on educational development in ECOWAS countries. It is expected that aid would have a positive impact on educational development. This situation may be attributed to the wrong application of such aids by the receiving countries. Another possible explanation for this result is that ODA inflows are utilized by the receiving countries in other areas other than in educational development. Often times, ECOWAS countries channel a majority of aids to infrastructural developments such as road and rail construction, finance of transportation, health facilities, military equipment, etc. which the countries consider as having a better impact on the standard of living of the people. Another explanation for the negative impact of ODA is the diversion of aid proceeds to other purposes by aid-receiving countries.

It is recommended that ECOWAS countries should channel more of ODA aids to the development of educational infrastructures because of the immense benefit a literate and skilled population can have on the economic growth and development of a country. Even, in the absence of aid, ECOWAS countries should on their own volition allocate a sizeable percentage of their annual budgets for educational development infrastructure.

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