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An Empirical Assessment of External Debt and Economic Growth Nexus in West African Countries

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Abstract

The mounting cost of external debt servicing in the face of volatile growth indices amongst developing economies has renewed research interest in the so far non-consensual claim of cross-border capital flows in the form of external debt as a veritable source of fostering or stifling the economic growth of the ever increasingly interdependent global economies. The paper investigated the impact of external debt on economic growth in the ECOWAS sub-region during the period 1990-2023. The study analyzed a panel data set using the fixed and random effect models. The results of the panel data unit root test confirmed that the variables in the specified model were integrated in different orders I(1) and I(2). The Pedroni panel co-integration test indicated that a long-run relationship existed among the variables in the specified debt-growth model. The results of the model estimation revealed that external debt negatively and significantly impacted economic growth at the 1% level during the period under study. The results further revealed that debt service negatively impacted economic growth, but failed the significance test at the 5% level. The study thus concluded that external debt compromised the economic growth of ECOWAS sub-region during the period under review. Accordingly, the paper recommended that countries in the ECOWAS sub-region should strive to reduce external debt accumulation and the facilities already incurred from external debt should be directed at efficiently boosting the economic growth of the region.

Keywords: External Debt, Economic Growth, Debt Servicing, ECOWAS, Panel Data

1.0 Introduction

The inflow of external debt to African countries has been a major source of funds for investment, infrastructural development, and growth enabling expenditures due to the low level of income and savings that characterize the continent. Since the 1990s, high external debt from developed countries has received increasing attention from academics, policymakers, and the general public (Anifowose, 2016; Lawanson, 2014). External debt accumulation constitutes a burden on the country's resources in foreign exchange through debt service and principal repayment (Iyoha, 1999). Some of these

countries have received huge sums in foreign credits at very high concessional interest rates, and have over the past decades accumulated huge external debt that they are now been classified as highly indebted poor countries (HIPC) of the world. In some Sub-Saharan African (SSA) countries, the stock of external debt has so much piled up to a level widely considered unsustainable.

The ECOWAS sub-region's economic growth rates have been low compared with other sub-regions in developed and emerging countries, and it has become an issue of discussion among academics, policymakers, and researchers (Iyoha and Okim, 2017). According to World Bank (2024), the average growth rate of ECOWAS sub-region was about −1.02824% in 1990. It rose to about 1.93243% in 1994. It dropped to about 2.267907 in 2003 and rose again to 5.744731 in 2008, 6.269861 in 2013 and 5. 719806 in 2022. ECOWAS sub-region growth rates kept fluctuating from 1990 to 2023. The highest average growth rate was about 12.06774% in 1997 due to a very high growth rate of about 106 posted by Liberia in 1997. The lowest growth rate of ECOWAS sub-region was about −1.85555% in 1992.

As of 1990, ECOWAS sub-region external debt accumulated to about 73 billion US dollars. It rose to about 86 billion US dollars in 2003 and fell drastically to about 57 billion in 2006. ECOWAS's accumulated external debt rose from about 81 billion dollars in 2010 to about 3.5 trillion US dollars in 2022 (World Bank, 2024). Different countries in the ECOWAS sub-region have different external debt levels, which account for the region's high debt accumulation. The high debt accumulation in the ECOWAS sub-region calls for an empirical investigation to determine the impact of external debt on economic growth.

The cost of external debt service was unstable over the period under review. In 1991, it was about 5.4 billion US dollars. It fell to 3.5 and 3.9 billion US dollars in 1993 and 1997 respectively. It rose to about 10.2 billion US dollars in 2005, 12 billion US dollars in 2018 and 17 billion US dollars in 2022. ECOWAS spent about 2.4 trillion US dollars on debt service from 1990 to 2022 (world Bank, 2024). On average, the ECOWAS sub-region spent about 7.4 billion US dollars annually on debt service (World Bank, 2024). This sum could have been channeled into more productive economic activities to boost economic growth and development in the region.

It has been acknowledged that the obligation of repaying the accumulated value of external debt may not be feasible and fear has been expressed that it is expected to compound the economic problems of poor countries (Elkhalfi, et al., 2024; Ismael et al., 2024; Anifowose, 2016).

In ECOWAS countries, the accumulation of external debt has been motivated by several common factors. Conspicuous among these factors are the attraction of additional resources to bridge the resource gap required for development, resource demands to combat civil war, financing of balance of payments deficits, as well as corruption (Iyoha, 1999). Like most developing countries, ECOWAS countries are characterized by inadequate internal capital formation due to the vicious cycle of low productivity, low income, and low savings. To bridge the identified resource gap, most ECOWAS countries

rely substantively on external funding, usually in the form of external loans, to finance their development projects (Lawanson, 2014). The question of great interest that emanates not only from an academic point of view but also from an economic policy perspective relates to the impact of external debt and, invariably, of debt servicing on economic growth in the ECOWAS sub-region. It becomes imperative to investigate whether the levels of the ECOWAS sub-region's external debt accumulation and debt service significantly and negatively affect economic growth. This is to empirically establish the predictions of the debt overhang hypothesis in the ECOWAS sub-region (Dawood et al., 2024).

Over the years, some empirical studies established the effects of external debt and on economic growth (Anifowose, 2016; Iyoha, 1999; Kasidi and Said, 2013; Lawanson, 2014; Paul, 017), but the focus has been more on national level than regional and sub-regional levels. To effectively bring to bear and disseminate the same for policy-making purposes, there is a need to investigate the extent to which external debt contributes to the growth problems in the ECOWAS sub-region. Thus, this study contributes to the understanding of the effects of external debt on economic growth in the ECOWAS sub-region. As far as the authors are aware, this study will reduce the paucity of studies that investigated the impact of external debt on economic growth in the ECOWAS sub-region. The findings of this study are expected to guide the authorities in the ECOWAS sub-region in terms of drafting proper external debt policies that enhance economic growth.

The specific objective of the study is therefore to investigate the effect of the aggregate external loans from all sources such as foreign governments, multilateral organizations, lending clubs and other lenders on the economic growth of ECOWAS sub-region. The remaining portion of the paper is organized as follows: Section 2 reviews the relevant literature. Section 3 outlines the methodology deployed in the study. Section 4 presents and discusses the empirical results of the paper. and section 5 presents the conclusion and recommendations, premised on the findings.

2.0 Literature Review

This section does the conceptual, theoretical and empirical reviews of the literature relevant to the nexus between external debt and economic growth. This is in a bid to properly sharpen the focus of the study and identify the research gaps in the extant literature, with a view to filling same.

2.1 Conceptual Review

2.1.1 External Debt

According to Paul (2017), external debt essentially refers to a country's liabilities owed to non-residents, payable in foreign currency. It represents a total amount country owes to foreign creditors, encompassing both principal and interest payments, due in the future. It is also defined as the outstanding amount of actual and current liabilities that require repayment of the principal and interest at some point in the future, owed by residents of a country's of a country to non-residents (Dawood et al., 2024). The sources of external

debt include government borrowing, private sector loans, investments and trade credits (Ali and Mustapha, 2012).

External debts are often incurred to finance development projects, infrastructure, tackle business cycle scenarios such as depressions and recessions, among other purposes (Rahmon, 2021).

2.1.2 Economic Growth

Economic growth essentially signifies a rise in the productive capacity of the economy, meaning the ability to produce more goods and services. It is a sustained increase in a country's real gross domestic product (GDP) or per capita income over a relatively short period of time, usually a year. It is often measured as a percentage change in real GDP, which adjusts for inflation (Solow and Swan, 1956).

According to Shkolnyk and Koilo (2018), economic growth is a sustained increase in a country's real national and per capita income over a long period. It is measured by the percentage increase in real GDP, often expressed per capita. This is typically achieved through efficient resource allocation, increased production capacity, and advancement in technology, infrastructure and human capital.

Siddique et al. (2015) identified the following as the major sources of economic growth of a country:Natural resources, power and energy resources, capital accumulation, technological know-how, quantity and quality of labour force, transportation and communication, education and training. This implies that diversification is at the core of economic growth, meaning a focused commitment to all the productive sectors of the economy. This is to ensure that gains from some sectors are not compromised by imperfections from from some other sectors as the sectors are inter-related.

2.2 Theoretical Review

A number of theoretical postulations has been deployed to explain debt-growth nexus. Such theories include the Harrod-Domar model, debt overhang hypothesis, crowding-out effect, liquidity constraint hypothesis, factor productivity growth compression hypothesis, as well as Solow-Swan growth model.

This study is premised on the Solow-Swan growth model. The Solow-Swan exogenous growth model integrates Harrod-Domar and factor productivity postulations with some insightful extensions. The theory is based on the following assumptions: constant returns to scale exogenous technological progress, diminishing returns to capital, perfect competition, the theory attempts to explain long-run economic growth by looking at capital accumulation, labour or population growth, and increase in productivity largely driven by technological progress. They argued that technological progress arises from research and development (R and D) activities around the world, which less endowed economies can acquire from more endowed economies in various forms such as direct technology transfer which is often conditional and external loans meant for acquisition of the needed technology.

This paper modifies the Solow-Swan model by considering a population growth rate n(t) that is non-constant over time. We assume that n(t) is bounded and convergent to a positive number n* as t tends to infinity. In the long-run, the per capita capital of the model converges to the non-trivial steady state of Solow-Swan model. To this end, this study is underpinned by this theory as it is essentially out to test the empirical veracity thereof within the chosen time period in Nigeria.

2.3 Empirical Review

A review of the literature examining the impact of external debt and debt service on economic growth reveals that the influence of external debt on economic growth can either be positive, negative or non-linear. This revelation indicates that there are three strands of empirical antecedents on this nexus.

The first group offers evidence of a positive relationship between economic growth and external debt. The views are based on the provisions of the Keynesian and Neoclassical theory of growth, where external debt contributes positively to economic growth, provided the borrowed funds are engaged in productive activities which yield returns for the payment of the loan and accrued interest. This approach was observed by Anifowose (2016), Kasidi and Said (2013) and Paul (2017).

Anifowose (2016) studied the impact of external debt and debt serving on economic growth in some selected ECOWAS countries. He analyzed time series data stretching from 1970 to 2008 using an error correction model. He found that external debt positively impacts economic growth in Benin and Niger. The study recommended that external debt contracted should be engaged in productive economic ventures which would generate profits for debt repayment.

Kasidi and Said (2013) investigated the impact of external debt on economic growth in Tanzania for the period of 1990-2010. Annual time series data on external debt and economic performance were analyzed using Ordinary Least Squares (OLS) estimation method. The study revealed a significant impact of external debt and debt service on GDP growth and that external debt stock and debt servicing had different impacts on economic growth in Tanzania. It recommended that future external debt should be engaged in productive use and efforts be made to have higher rate of return on debt- financed investment than the service payment rate.

Paul (2017) studied the impact of external debt on economic growth in Nigeria from 1985 to 2015 using error correction mechanism. The study revealed that debt service payment had negative and insignificant impact on Nigeria's economic growth while external debt stock had positive and significant effect on Nigeria's growth index. The study recommended that government should spend external debt on infrastructural development to improve business environment for investment to strive in Nigeria.

The second strand provides evidence of negative impact of a high level of external debt on economic growth. This group of model is based on the theory of "debt overhang" developed by Krugman (1988). A debt overhang occurs when the accumulated external debt of a country is so high that the indebted country finds it difficult to repay the loan

and its interest. Debt overhang theory hypothesises that if debt exceeds a country's repayment ability with some probability in the future; expected debt service is likely to be an increasing function of the country's domestic output level. Some of the returns from investment in the domestic economy are effectively taxed away by the government and this has clear potentials of discouraging both domestic and foreign investors (Claessens et al., 1996; Krugman, 1988; Sachs, 1988). Low investment expenditure will be the result of large debt stocks and its consequence is low economic growth in the domestic economy. Another channel large debt stock affects the domestic economy is through poor macroeconomic policy environment. The above scenario is likely to affect the efficiency of investment, as governments will eventually have less incentive to undertake difficult policy reforms such as trade liberalization or fiscal adjustment (Pattillo et al., 2011).

Ali and Mustapha (2012), Anifowose (2016), Iyoha (1999), Jarju et al. (2016), Khariru and Mbah (2018), Odejimi and Ozor (2018), Shabbir (2009), and Siddique et al. (2015) found a negative relationship between external debt and economic growth. Ali and Mustapha (2012) examined the long-run and short-run impact of external debt on economic growth in Pakistan from 1970 to 2010. They found that external debt had a significant negative impact on economic growth. It recommended the encouragement of increased domestic savings and export earnings, attracting more foreign direct investment and a reduction in external debt stock.

Anifowose (2016) studied the impact of external debt and debt serving on economic growth in some selected ECOWAS countries from 1970 to 2008 using Error Correction Models. The study found a negative impact of external debt on economic growth in Burkina Faso, Cote d'Ivoire, Gambia, Guinea-Bissau, Nigeria, Sierra-Leone and Togo. The study recommended that external loans inflows should be engaged in productive economic activities which would generate profits for loan repayment.

Iyoha (1999) examined the effects of external debt on the economic growth of sub-Saharan African countries and concluded that both external debt stock and debt service obligations tended to lower economic growth rates in the countries. It recommended that sub-Saharan African countries should endeavour to reduce external debt inflows to have a substantial investment recovery.

Khariru (2018) investigated the relationship between government external debt and economic growth in Oman using annual time series data for the period 1990-2015. The data were analysed using an error correction mechanism to ascertain the short-run dynamic nature of external debt and economic growth. The study revealed a negative and significant influence of external debt on economic growth in Oman and recommended a more productive use of external debt funds to affect growth positively.

Odejimi and Ozor (2018) studied the effects of debts on the economic growth of countries in West Africa using panel data for the period 1970-2011. Employing the fixed and random effects, and GMM estimation techniques, the study found a significant and negative relationship between debt stock and economic growth. The study recommended

that the governments of West African countries should reduce their reliance on debt as a strategy to grow their economies.

Shabbir (2009) investigated the impact of external debt on economic growth in 24 developing countries from 1976 to 2003. The study applied random effect and fixed effect estimation. The results show that the debt servicing to GDP ratio negatively affects economic growth and may leave less funds available to finance private investment in these countries leading to a crowding out

effect. The study recommended that external loans contracted should be invested in productive economic activities with higher rates of return to offset the effect of loan repayment service.

Siddique et al. (2015) analyzed the extent to which external debt burden impacted a country's gross domestic product (GDP) using data from highly indebted poor countries (HIPC) over the period 1970-2007. The findings revealed a negative relationship between external debt and economic growth both in the short run and in the long run. The study recommended a reduction in external debt stocks of the highly indebted poor countries to boost economic performance.

The third group of relevant empirical literature noted that the nature of the effect of debt on growth is non-linear, depending on the stage of growth of the economies concerned. At the early stages, when a country borrows and invests, high growth is generated. Subsequently, when the debt is being repaid, growth tends to fall. For example, Lawanson (2014), Emerenini and Nnanna (2015), Shkolnyk and Koilo (2018), Elkhalfi, et al. (2024) and Dawood et al. (2024) provide empirical evidence of a non-linear effects of external debt on economic growth.

From the foregoing, it is worth mentioning that apart from the non-consensual nature of the findings, some methodological and geographical gaps are noticeable in the extant literature. The literature is dominated by time series and cross-sectional analyses at country level. The current study thus seeks to address these gaps by analyzing a panel data set on the entire countries in the ECOWAS sub-region using the fixed effect and random effect models in order to do a robust analysis of the nexus under review.

3.0 Methodology

This section presents model specification, methods of data analysis and data used for the study.

3.1. Model Specification

The model for the study is premised on the standard neoclassical growth model first formulated by Solow and Swan in 1956. The neoclassical growth model outlines how an economy can achieve growth using a combination of three main factors, capital, labour and technology. The production function is specified as:

$$Y = AF(K, L) \quad (1)$$

Where Y represents an economy's gross domestic product (GDP)

K denotes capital

L stands for labour and

A represents the level of technology

As a result of the relationship between technology and labour, the production function can be written as:

$$Y = F(K, AL) \quad (2)$$

Capital in the model is represented by gross fixed capital formation (GFCF), in addition to external debt (EXD) which constitutes a source of additional capital for investment due to the shortage of domestic savings in most developing and emerging economies of the world. Labour is proxied by the level of employment in ECOWAS. Other factors that propels economic growth in the economics literature are included in the model as control variables and to avoid the likely problem of under-specification. The control variables are foreign direct investment (FDI) and trade openness (TOP). Thus, the functional relationship specified for the model becomes:

$$RGDP = F(EXD, EXDS, EMP, GFCF, FDI, TOP) \quad (3)$$

The econometric form of model (1) takes a dynamic panel regression form which assumes cross-sectional heterogeneity (cross-section effect) and period heterogeneity (time effect), and the inclusion of a one-period lagged variable of the dependent variable as an explanatory variable. The dynamic panel multiple regression model with an error term (ε_t) is specified in econometric form as:

$$RGDP_{it} = \beta_0 + \beta_{1R}GDP(-1)_{it} + \beta_2\, EXD_{it} + \beta 3EXDS_{it} + \beta_4 LAB_{it} + \beta_5 GFCF_{it} + \beta_6\, FDI_{it} + \beta_7 TOP + \alpha_i + \varepsilon_{it} \quad (4)$$

Where:

$RGDPit$ = current gross domestic product growth rate of country i adjusted for inflation at time t;

$GDP(-1)$it = one-period lagged of gross domestic product growth rate;

EXD_{it} = current level of external debt of country i at time t;

$EXDS_{it}$ = current external debt service of country i at time t;

EMP_{it} = Employment as a percent of the population of country i at time t;

$GFCFit$ = current gross fixed capital formation to GDP ratio of country i at time t;

$FDIit$ = current foreign direct investment to GDP ratio of country i at time t;

The β's = are coefficients of the regressors;

αi = unobserved individual (country-specific) effects;

εit = error term over the cross-section at time t; and

i and *t* denote cross-section and time indicators, respectively.

3.2. Pabel Fixed and Random Effects Model

The method of data analysis adopted in the study is the panel data analysis. This is because the panel data analysis method takes into consideration the cross-sectional and time-series features of the sample data. The data being analyzed are from 15 different countries of the ECOWAS which often possess many differences that may be policy, institutional or the macroeconomic environment. Thus, any empirical analysis that does not take into cognizance these peculiar characteristics may produce biased results. In essence, the panel data analysis accommodates 'time as well as the heterogeneity effects of the countries. The panel data analysis captures the aforementioned characteristics by including the individual country's specific effects which may be random or fixed.

The regression methods employed are the fixed and random effects models, to analyse the effect of external debt on economic growth in the ECOWAS sub-region.

The fixed effect 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. The Hausman test is used to select the best-fit model between the fixed and random effect models. Preliminary checks on the series were carried out to ascertain the stationarity status and long-run co-integration of the series. For the stationarity check, a summary of the panel unit root tests of Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) and ADF Fisher Chi-Square were applied while the Pedroni Residual cointegration test was relied upon to ascertain the existence of cointegration.

3.3. The Data

The data used in this paper are annual panel data (a combination of time series and cross-sectional data). The sample data covered the period 1990-2023 for 15 countries, namely Benin, Burkina Faso, Cabo Verde, Cote D'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The data on real gross domestic product growth rate (RGDP), external debt (EXD), debt service (EXDS), ratio of gross fixed capital formation to GDP (GFCF/GDP), ratio of foreign direct investment to GDP (FDI/GDP), trade and employment were obtained from the World Bank's World Development Indicators (WDI, 2024)

4.0 Results and Discussion

This section presents the descriptive statistics, correlation chart, panel unit root tests, panel co-integration tests, and model estimation results.

4.1. Descriptive Statistics

The descriptive statistics of the data are presented in Table 1.

Table 1: Descriptive Statistics of the Variables

	RGDP	GFCF	EMP	EXD	EXDS	TOP	FDI
Mean	4.10005	8.775014	1.741731	72.44728	2.874564	50.00925	1.366217
Median	4.39264	0.00000	1.178652	51.19240	1.860951	41.96416	0.027443
Maximum	06.27	2357.67	6.14474	610.4519	59.67140	986.646	167.329
Minimum	-51.0308	−294.161	0.0000	0.0000	0.0000	8.72920	−202.823
Std. Dev.	7.8613	108.818	1.42231	81.75575	4.463708	70.2681	15.4139
Skewness	3.02072	20.4443	1.42131	3.173523	7.693597	9.03912	−0.39900
Kurtosis	68.1439	442.338	4.10424	15.31639	87.10810	97.9607	99.7880
Jarque-Bera	87923.1	3999266	191.034	3943.556	150178.9	191948	192446
Probability	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Obs.	493	493	493	493	493	493	493

Source: Authors' Computation (2025)

According to Table 1, the mean value of the RGDP growth series is 4.100053 indicating that on average, the economies of ECOWAS grew at the rate of 4% for the period under review. The average external debt and debt service figures for the ECOWAS during the period were 72 billion and 2.874564 billion US dollars respectively. Similarly, the average ratios of GFCF/GDP and FDI/GDP stand at 8.7750141 and 1.366217 respectively.

The J-B values for all the series are significant at the 1% level thereby rejecting the null hypothesis that the variables are normally distributed. The series was normalized after the first differencing. This outcome clearly shows that the use of the panel data analysis procedure for the estimation of the relationships in this study is appropriate considering the heterogeneity in all the data series.

The skewness of the dependent variable RGDP is positive at 3.020720, indicating that most RGDP values are on the right side of the mean. The skewness of the other variables is positive showing that for most of the countries, the variables lie to the right side of the mean as well. The kurtosis for the RGDP value is high at 68.14 and indicates the presence of extreme values. The data set is highly leptokurtic and shows that extreme outliers in

the RGDP values may generate heterogeneity issues in the analysis. This feature is dealt with by the choice of regression techniques used in the study.

4.2. Correlation Chart

Table 2: Correlation Matrix of the Variables

	GDP	GFCF	EMP	EXD	EXDS	TOP	FDI
RGDP	1						
GFCF	0.03997	1					
EMP	0.11119	0.008326	1				
EXD	-0.098896	0.044218	−0.040743	1			
EXDS	-0.041571	0.043893	0.064808	0.228508	1		
TOP	.083231	−0.013868	0.043890	−0.122702	0.0167412	1	
FDI	0.152028	−0.006294	0.011134	0.108048	0.0141825	0.168133	1

Source: Authors' Computation (2025)

The correlation chart in Table 2 shows that there is a negative association/relationship between economic growth and the main variables of interest in the study; external debt and debt service. The relationships with other variables in the model are positive. The relationships are expected to be validated with the outcome of the regression results.

4.3. Panel Stationarity Test

In this section, it was imperative to ascertain the unit roots (stationarity) status of the data on all the individual variables. The results are shown in Table 3.

Table 3: Unit Roots Test Results

Variable	LLC Test (Prob.)	IPS Test (Prob.)	ADF/Fisher Test (Prob.)	LLC Test (Prob.)	IPS Test (Prob.)	ADF/Fisher Test (Prob.)	Inference
	Results at Levels			Results at First Difference			
RGDP	6.021(0.00)	−8.204/(0.00)	127.8/(0.00)	na	na	na	I(0)
GFCF	1.463/(0.92)	0.560/(0.71)	30.05/(0.18)	−8.79/(0.00)	−11.42/(0.00)	163.4/(0.00)	I(1)
EMP	156.01/(1.00)	2.69/(0.99)	20.2/(0.91)	12.02/(0.00)	−6.45/(0.00)	116.8/(0.00)	I(1)
EXD	0.53(0.70)	1.918/(0.9)	15.00/(0.98)	−8.57/(0.00)	−9.70/(0.01)	151.5/(0.01)	I(1)
EXDS	1.76/(0.96)	−1.06/(0.14)	28.9/(0.52)	−8.07/(0.00)	−14.01(0.03)	228.2/(0.00)	I(1)
TOP	1.61/(0.05)	−1.72/(0.04)	50.72/(0.01)	na	na	na	I(0)
FDI	−8.26/(0.00)	−9.26/(0.00)	157.9/(0.00)	na	na	na	I(0S)

Source: Authors' Computation (2025)

To do this, a summary of the major panel unit root test methods of Levin, Lin and Chu (LLC) (2002), Im, Pesaran and Shin (IPS) (1997), ADF Fisher Chi-Square and PP Fisher Chi-Square were applied. The summary of the tests is presented in Table 3.

The outcomes of the unit root tests showed that gross domestic growth rate (GDP), trade openness (TOP) and foreign direct investment (FDI) were stationary at the level. In contrast, gross fixed capital formation (GFCF), employment (EMP), external debt (EXD) and debt service (EXDS) were stationary at first difference.

4.4. Panel Co-integration Test

Table 4: Results of Panel Co-integration Test

Outcome	No Deterministic Trend	Det. Intercept & Trend	No Deterministic Int. & Trend
Within Dimension			
Panel v-stat.	−2.605231 (0.9954)	−4.048680 (1.0000)	−1.919099 (0.9725)
Panel v-stat. (weighted)	−2.967202 (0.9985)	−4.399536 (1.0000)	−2.267184 (0.9883)
Panel rho-statistic	−2.009061 (0.0223)*	−1.196174 (0.1158)	−2.774977 (0.0028)*
Panl rho-stat. (weighted)	−0.934686 (0.1750)	0.140263(0.5558)	−2.271541(0.0116)*
Panel PP-statistic	−13.48991 (0.0000)*	−13.05328 (0.0000)*	−12.59677 (0.000)*
Panel PP-stat (weighted)	−12.93550 (0.0000)*	−13.68212 (0.0000)*	−11.27947 (0.0000)*
Panel ADF-statistic	−5.224995 (0.0000)*	−4.345391(0.0000)*	−5.473424 (0.0000)*
Panel ADF-stat(wt)	−5.804095 (0.0000)*	−5.607428 (0.0000)*	−5.521669(0.0000)*
Between Dimensions			
Group rho-statistic	−0.256627 (0.3987)	0.745990 (0.7722)	−1.632541 (0.0513)
Group PP-statistic	−18.62099 (0.0000)*	−19.28928 (0.0000)*	−19.89514 (0.0808)*
Group ADF-statistic	−4.799275 (0.0000)*	−4.153702 (0.0000)*	−5.183990 (0.0000)*

*Passes significance test by at least 5%
Source: Authors' Computation (2025)

To verify the existence of co-integration among the series, Pedroni (1999) co-integration test was conducted under the assumptions of no deterministic trend, deterministic intercept and trend, and no deterministic intercept and trend, . As shown in Table 4, 21 out of the 33 within-dimension and between-dimension tests confirmed the existence of a long-run relationship among the variables.

4.5. Panel Fixed Effect/Random Effect Results

The panel data estimation procedure adopted assumed that the biases in the pooled data could either come from cross-sectional heterogeneity or time series (periodic) variations, hence the fixed effect and random effects models were estimated. The Hausman test of

heterogeneity was used to determine the best effects model to be employed in the analysis.The results of fixed and random effects that model the relative significance of the independent variables to the dependent variable are presented in Table 5.

Table 5: Panel Fixed Effect/Random Effect Model

Variable	**Fixed Effect Model**		**Random Effect Model**	
	Coefficient	**P-value**	**Coefficient**	**P-value**
C	2.055427	(0.0633)	2.395685	(0.00020)***
RGDP(−1)	0.524676	(0.0000)***	0.506362	(0.0000)***
GFCF	0.004344	(0.1122)	0.004212	(0.1192)
EMP	0.136409	(0.7862)	0.205047	(0.3374)
EXD	−0.010407	(0.0250)**	−0.011233	(0.0003)***
EXDS	−0.004919	(0.9465)	−0.016242	(0.8131)
TOP	0.004983	(0.3455)	−0.000508	(0.9087)
FDI	0.220254	(0.0000)***	0.203482	(0.0000)***
Model Diagnostics				
R-squared	0.289505		0.276786	
R-Squared Adjusted	0.256785		0.266014	
F-statistic	8.847926 (0.00000)		25.69664 (0.00000)	
Durbin-Watson stat.	2.144266		2.089113	
Hausman test statistic/(P-value)	7.842196/(0.3467)			

***indicates a 1% level, and **indicates a 5% level of significance.
Source: Authors compilation (2024)

Table 5 shows the summary of the estimation results of the fixed effect model, random effect model, and the Hausman test.

Using the Hausman test, the fixed and random effects models were assessed for appropriateness. With the probability of the Chi-square statistic being 0.3467, it follows

that the null hypothesis that the random effect model is more appropriate could not be rejected. From the results, the one period lagged RGDP was positively and significantly correlated with economic growth. This showed that RGDP growth in one period has the potential to increase growth in the next year in the ECOWAS sub-region.

4.7 Discussion of Findings

The estimated model indicates that an increase in external debt contributed to a decrease in the economic growth rate in the ECOWAS sub-region within the period under review. The effect was highly significant at the 1% level. A unit rise in the external debt was associated with about 0.011233 unit fall in the economic growth rate. This was an indication that external debt was one of the major causes of the low economic growth in the ECOWAS sub-region during the period of the study. The implication is that a reduction in external debt accumulation will help to increase economic growth in the ECOWAS sub-region, ceteris paribus. This could result from the high likelihood that external debt reduction will enhance economic growth which will in turn engender job creation or employment generation and poverty reduction. This evidence is in sync with the evidence from Iyoha (1999), Anifowose (2016) and Odejimi and Ozor (2018). Iyoha (1999) found that external debt and debt services hindered growth in sub-Saharan African countries. Anifowose (2016) and Odejimi and Ozor (2018) found a negative impact of external debt on economic growth in ECOWAS countries.

The estimated model further revealed that debt service had a negative relationship with economic growth in ECOWAS sub-region, but its impact on growth was insignificant during the period of the study. The finding implies that an increase in debt services may likely hinder economic growth, but its hindrance may not be significant. This result corroborates the findings of Rahmon (2018).

The value of the coefficient of determination (R squared) of the random effects model was 0.27, indicating that about 27% of the systematic variations in GDP growth in ECOWAS were captured

by the variables taken together in the model. The R square value was low. However, the low R square is not a problem as noted by Iyoha (1999). The F-statistic (25.6966) and corresponding P-value (0.0000) also showed that a significant relationship existed between the GDP growth rate and all the independent variables service on economic growth in the ECOWAS sub-region. The study is important because it revealed the impact of external debt and debt service on economic growth in the sub-region. To the best of our knowledge, this is one of the few empirical studies on external debt, debt service and economic growth focusing on the ECOWAS sub-region. The study therefore contributes to the existing literature. In an attempt to estimate the specified debtgrowth model, the fixed and random effect models were employed in analyzing data covering the period 1990-2022.

The results of the study indicated that external debt exerted a significant and negative impact on economic growth. Debt service also exerted a negative but insignificant impact on economic growth in the ECOWAS sub-region during the period of the study. The

findings imply that an increase in external debt and debt service has the potency to hinder economic growth in the ECOWAS sub-region.

5.0 Conclusion and Recommendations

This study investigated the impact of external debt on economic growth in the ECOWAS sub-region. The study is important because it revealed the impact of external debt and its direct cost, debt servicing, on economic growth in the sub-region. To the best of our knowledge, this is one of the few empirical studies on external debt, debt service and economic growth focusing on the ECOWAS sub-region. The study therefore contributes to the existing literature. In an attempt to estimate the specified debt-growth model, fixed and random effect models were employed in analyzing data covering the period 1990-2023.

The results of the study indicated that external debt exerted a significant and negative impact on economic growth. Debt service also exerted a negative but insignificant impact on economic growth in the ECOWAS sub-region during the period of the study. The findings imply that an increase in external debt and debt service has the potency to hinder economic growth in the ECOWAS sub-region. Considering the negative impact of external debt on economic growth in the sub-region, the study recommended that ECOWAS countries should reduce external debt accumulation to grow their economies. The study further recommended that ECOWAS governments should channel the revenues generated from external debt in productive expenditures to boost the economic growth rate.

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