EXTERNAL DEBT AND CORRUPTION ON ECONOMIC DEVELOPMENT IN ECOWAS COUNTRIES

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ABSTRACT

This paper uses the Pooled Mean Group cointegration technique to investigate the relationship among external debt, corruption, and economic development for 16 ECOWAS countries over the period 1996-2022. Our results show that in the long run, external debt and corruption impact economic development positively and negatively. Meanwhile, the short-run dynamic reported a positive nexus among the trio of external debt, corruption, and economic development in the ECOWAS countries. It was also established that the economy would take four years to adjust back to equilibrium based on the error correction mechanism. The study recommends that the governments of ECOWAS countries should address the menace of rising external debt through the adoption of other sources of capital and the issue of corruption be tackled head-on by such penalties that tend to make corruption less attractive.

Keywords: Corruption, Economic development, ECOWAS, External debt, PMG

JEL: D73, F63, H63, C23

1. INTRODUCTION

The debate concerning the expected macroeconomic effects, primarily on long-term economic growth, has erupted in response to the significant increase in public debt in many wealthy countries during the past few years. The financial crisis of recent years is broadly acknowledged as the origin of the current debt problem, but the ensuing depression also played a role (Aladejare, 2022). There is concern that enormous debts will continue to exist since they reflect underlying structural issues. Adverse economic effects are, therefore, considerably more likely to manifest (Dar & Amirkhalkhali, 2014). Public debt is one of the most critical measures of a nation's financial and economic stability. Nations do occasionally borrow money, but only in small amounts, as several variables can influence some levels, forcing some nations to carry excessive debt loads that occasionally reach 100% of their GDP. In the 2008 financial crisis, several European nations experienced significant rises in their debt-to-GDP ratio (Ksantini, 2016).

Globally, paying government budgets requires sustainable funding policies to promote economic progress. Usually, when the estimated tax collection is less than the estimated spending of the government, there is no choice except to raise taxes or borrow money from either internal or external sources. Public debt happens when governments decide to borrow as a substitute due to a shortage of public revenues; public debts can, therefore, be considered

short- and long-term loans obtained by governments to meet public spending. Following the Second World War, many established and emerging economies decided to finance their budget deficits through domestic or foreign borrowing. These struggles have resulted in the accumulation of public debt for many nations, which is also a cause of the economic downturn and financial problems many developed and developing nations experienced in the early 2000s (Hilton, 2021). According to research, it is extremely unlikely for a nation to have a surplus budget, making the need to incur public debt necessary and unavoidable. Therefore, it follows that accumulating public debt is not always a negative, yet it can limit economic growth if it reaches unsustainable levels. Therefore, while borrowing to support public spending is not necessarily bad, it can harm economic growth if it is not properly and effectively handled.

According to economic theory, a developing country's economic growth is likely to be enhanced by borrowing at affordable rates. The economy's poverty status is anticipated to be favourably impacted by increased economic growth – at least greater than a 5% growth rate. To promote growth, developing nations like Nigeria and others in the West African region borrow to supplement what they already have due to the dominance of small capital stocks; as a result, they are likely to have investment opportunities with higher rates of return than their counterparts in developed economies (Aqeeq & Chamadia, 2023). This takes effect as long as borrowed money and some money that has been internally reinvested are correctly put to use for productive investment and as long as macroeconomic instability, policies that distort economic incentives, and significant adverse shocks are avoided. There is a good chance that growth will pick up and make it possible to pay off debt on schedule. Growth will favour per capita income when this cycle is sustained over time, a requirement for reducing poverty.

Economic growth has become a central macroeconomic objective for nations worldwide, as it plays a crucial role in fostering overall economic development. Meaningful progress is unlikely without sustained economic growth, particularly in developing countries with rising population growth and limited economic resources (Aladejare, 2022; Chiyemura et al., 2022). Consequently, these countries often use public borrowing to address infrastructure deficits, create jobs, and achieve more equitable resource allocations. However, the efficient utilisation of public borrowings is paramount, as poor debt management can undermine future infrastructural development, job creation, access to credit, and overall national progress (Aladejare, 2022; Aladejare et al., 2022). Economic growth plays a pivotal role in improving the standard of living of a country's populace. The inadequacy of resources to pursue desired growth often compels governments to borrow, particularly in developing countries with limited fiscal space (OECD, 2020). The International Monetary Fund (IMF) data indicates that many low-income developing economies experienced a rise in median public debt as a percentage of GDP from 38.7% in 2010–2014 to about 46.5% in 2017, indicating the challenge of managing debt sustainably (IMF, 2018a).

The growth of public debt in developing countries has raised concerns about debt servicing costs. According to Grifths et al. (2020), debt servicing costs in developing countries rose from 6.6% in 2010 to 12.2% of government revenue in 2018. In African nations, the increasing burden of long-term external debt has led to calls for debt cancellations and rescheduling from internal and external stakeholders. For example, West African countries have averaged a long-term external debt-to-GDP ratio of around 69% from 1981 to 2020, surpassing the 40% benchmark for developing and emerging countries set by the IMF (Aladejare, 2023).

The heavy reliance on external borrowing, even in countries with limited exportable commodities and small economies, is reflected in the external debt-to-export ratio of about 312.6% in West Africa (Aladejare, 2023). This indicates that more than three times the value

of West African exports is required to meet debt obligations. Factors contributing to external debt accumulation in the region include inflation rate growth, exchange rate volatility, and the pursuit of import substitution and industrialisation (Aladejare, 2021). The economic shocks brought about by the COVID-19 pandemic in 2020 have further exacerbated the debt burden in West African economies, necessitating increased spending to avoid recession (Kirton & Wang, 2021).

Corruption can significantly undermine economic development and exacerbate the debt burden in developing countries. Before the pandemic, West African countries faced challenges related to poor longevity, as evidenced by the low life expectancy of about 53.4 years (Aladejare, 2023). Despite external borrowing to improve essential sectors such as healthcare, education, manufacturing, construction, and transportation, inadequate access to quality healthcare and other socio-economic amenities suggests that governments' borrowed funds have not yielded the expected impact over time. The failure to efficiently utilise external borrowings for critical development infrastructure, particularly in health, housing, education, energy, and agriculture, raises concerns about the possibility of a debt overhang crisis (Aladejare, 2023).

The relationship between economic development (or growth) and external debt has received large attention in both theoretical and empirical literature (see Adegbite et al., 2008; Edo et al., 2020; Suidarma & Yasa, 2021;), as does the relationship between corruption and economic development (see, Akkoyunlu & Ramella, 2020; Blackburn et al., 2010; Saha & Ali, 2017). The current study aims to empirically analyse the nexus of external debt, corruption and economic development in 15 ECOWAS countries from 1996 to 2022. Interestingly, the choice of the region is motivated by several factors. ECOWAS region has one of the continent's largest economies, for instance, Nigeria has the largest economy in Africa with an estimated real GDP (constant 2010 United States Dollar [USD]) of USD 469.377 Billion in 2018 growing from USD 95.185 Billion in 1970 (World Bank, 2019), and rose to USD535.34 Billion in 2023 (World Bank, 2024).

Furthermore, the United States (US) commodity exports to the region were USD 6.7 Billion in 2022, against the US commodities imports from ECOWAS amounted to USD 9.4 Billion, as the US trade balance with ECOWAS shifted from a goods trade surplus of USD 153 million in 2021 to goods trade deficit of USD 2.7 Billion in 2022 (US Trade Representative, 2023). The US foreign direct investment (FDI) in ECOWAS stock was USD 6.8 Billion in 2022, a 16.5% decrease from 2021. In terms of debt to GDP ratio, in 2023, it was 81.8%, 51.4%, 50.9%, 47.2%, 44.7 %, 43.3% and 37% per cent in Ghana, Ivory Coast, Niger, Benin, Guinea and Nigeria, respectively (International Monetary Fund, [IMF], 2023). Regionally, ECOWAS' debt-to-GDP ratio was 36.7% in 2020, projected to be 73.1% by ECOWAS Banks of Investment and Development (EBID) in 2024. It should be noted that except for Nigeria, all ECOWAS member states recorded debt-to-GDP ratios above the region in 2023.

Although the Nigerian economy has also felt the burden of huge external debt, like many other emerging market economies, Nigeria is among a group of 36 other nations (categorised as low-income poor countries, including 29 African economies) that benefited from ambitious outright debt forgiveness under the "multilateral debt relief initiative" (MDRI) by Western creditor nations (Paris Club) and global multilateral agencies in 2005. It has been only 14 years since the implementation of the MDRI, and there are fresh concerns about a looming external debt crisis in Africa. Hence, about 19 or more African countries are said to have surpassed the threshold of 60% debt-to-GDP fixed by the "African Monetary Co-operation Program (AMCP)" while 24 others have exceeded the 55% debt-to-GDP benchmark set by the IMF (Faizulayev et al., 2022; Nadabo & Dakyong, 2023; Rufai et al., 2022)

The contribution of the current study to the extant literature is in many folds. Firstly, this study analyses ECOWAS external debt stock and economic development nexus within an extended

recent data set. It employs the Panel ARDL dynamic methodology to study short- and long-run dynamic effects. Thus, by following the panel autoregressive distributed lag (PARDL) methodological approach, empirically estimating the short-term and long-run interaction among the adopted variables becomes very tractable. This way, explaining the dynamic behaviour of external debt stock and economic development in ECOWAS over time is plausible. Also, this study allows us to critically analyse the implication of additional external debt for the region at a time of slowing global growth and inadequate infrastructural funds in the country. Hence, we combine the trio of external debt, corruption and economic development in a model to examine the impacts of rising external debt and resource mismanagement on economic development. To our knowledge, this has not been captured in any recent panel analysis involving these variables in a model. Also, the selection of the countries is based on their large economies, their external debt stock, and data availability for the period 1996 - 2022.

The structure of the remaining section of the study follows accordingly. Section 2 gives a review of related literature. Section 3 presents the econometric methodological approach. Section 4 discusses the empirical findings. Section 5 completes the studies.

2. LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Classical Growth Theory

This framework of economic thought emerged during the 18th-century Enlightenment era. The theory was propounded by prominent economists, including Adam Smith, David Ricardo, and Thomas Malthus. Adam Smith, widely considered the father of modern economics, introduced the theory in his seminal work, The Wealth of Nations, published in 1776. He argued that economic growth is driven by capital accumulation, specifically savings and investments, which provide the resources for expanding production and increasing wealth.

In his Principles of Political Economy and Taxation, David Ricardo, published in 1817, built on Smith's ideas and posited that economic growth would eventually slow down and reach a steady state. He argued that this was due to the diminishing returns of investment, whereby additional capital leads to increasingly smaller increases in output. Thomas Malthus presented a more pessimistic view of economic growth in his, An Essay on the Principle of Population (1798). He argued that population growth would eventually outpace the economic growth rate, leading to a decline in living standards.

Classical growth theory operates on several key assumptions. It recognises that resources are finite and scarce, limiting long-term economic growth. In the short run, the theory assumes that labour is the sole factor of production that can be expanded. According to classical theory, capital accumulation, achieved through savings and investment, drives economic growth. Finally, the theory posits that economic growth will eventually reach a steady state, where further growth ceases to occur. These assumptions provide the foundation for understanding the mechanisms and dynamics of economic growth within the classical growth theory framework.

2.1.2   The Neoclassical Growth Theory

Neoclassical growth theory, also known as the Solow-Swan model, was developed in the 1950s by Robert Solow and Trevor Swan. The theory is based on the assumptions of perfect competition, constant returns to scale, and diminishing marginal capital productivity (Solow, 1956). The main argument of the theory is that economic growth is driven by increases in the stock of physical capital and technological progress, which are exogenously determined. Several studies have used the neoclassical growth theory to explain the long-run economic growth of countries. For instance, a study by Le and Narayan (2018) used the neoclassical growth model to analyse the determinants of economic growth in Vietnam. The study found that increases in physical and human capital were significant drivers of economic growth in Vietnam.

2.1.3 Endogenous Growth Theory

One of the economic growth theories is the endogenous growth theory, which was propounded by Paul Romer in 1990. The theory assumes that technological progress is endogenous and can be influenced by policies promoting innovation and human capital development (Romer, 1990). The endogenous growth theory argues that investments in research and development, education, and infrastructure can enhance the productivity of an economy and drive long-term economic growth (Romer, 1990). Unlike the traditional neoclassical growth theory, which views technological progress as exogenous and driven by random factors, the endogenous growth theory emphasises the role of policy in promoting innovation and economic growth.

2.2 Empirical Literature

The effective use of debt is expected to increase government investible capital on infrastructure, which will enhance investment and increase the level of domestic economic activities. Conversely, especially with years of experience in third-world countries, most of the debts incurred from both domestic and external, sovereign and private, sources have largely not been put into judicious use to foster the development of basic infrastructures that attract investment and enhance growth (Richards et al., 2003; Stella & Chikaza, 2013). In the studies carried out by Eberhardt and Presbitero (2015) on public debt and long-run growth, they took the sample of 118 economies between 1961 and 2012. Employing the common correlated effect mean group (CMG) and common correlated effect estimation techniques, the authors obtained evidence of a statistically significant and positive long-run relationship between debt and GDP. The error correction terms are also found to be negative, significant and less than one for each of the estimation techniques, which is similar to that of Olawale and Hassan (2016) and Siddique et al. (2015). In their study, Zhang and Liu (2021) examined the relationship between domestic debt and economic growth in a sample of European Union (EU) countries. Using panel data from 2000 to 2019 and employing the Difference-in-Difference (DID) technique, the researchers investigated domestic debt's long-term and short-term effects on economic growth. The findings indicated a positive and statistically significant association between domestic debt and long-term economic growth. Furthermore, the study revealed a positive but relatively weaker short-term effect of domestic debt on economic growth.

Sinha (2022) conducted an econometric perspective analysis on corruption and economic development. Using cross-sectional data and corruption perception index, the study shows that economic growth, the size of the public sector, and human development are individually significant in both years. Significant regional differences exist in corruption sources, but the impact of growth on corruption is insignificant. The size of the public sector is significant in

Asia Pacific, EU, and American continent countries, while literacy is significant in every region except the Middle East. Also, using neoclassical economic growth theory, Munasinghe (2019) conducted an empirical study using panel data from South Asian countries and time series data from the World Bank and the International Monetary Fund (IMF) from 1990 to the present. Public debt has a significant negative impact on the economic growth rate of South Asian countries. In contrast, debt service has a significant positive impact, according to his analysis using the Autoregressive distributed Lag (ARDL) technique, which identifies the nature and extent of the association between each variable.

Soh et al. (2021) examine the effects of government efficiency, corruption and inflation on public debt in a sample of 36 advanced and emerging economies from 1996 to 2018. The results of the analysis show that corruption and inflation in advanced economies have a significant and positive effect on public debt. Corruption causes public debt to increase, but on the flip side, inflation decreases public debt. In emerging economies, the results show a positive impact of government efficiency on public debt. Furthermore, Del Monte and Pennacchio (2020) investigate the impact of corruption on public debt in a sample of OECD countries from 1995 to 2015. The paper provides evidence that corruption increases public debt and that this effect is independent of the size of government expenditure. The paper estimates that if corruption was halved, public debt would decrease by 2% in the short term.

The study by Cooray and Schneider (2017) explores whether corruption and the shadow economy affect the level of public debt and if the shadow economy magnifies the effect of corruption on public debt. The paper uses a panel of 106 countries over the period 1996–2012 and finds that corruption positively impacts public debt, while the shadow economy has a negative impact. The paper also finds that the shadow economy moderates the effect of corruption on public debt. Similarly, Kadia (2020) examine the relationship between corruption and economic growth in Balkan countries from 2004–2017. The study finds that corruption increases the debt-to-GDP ratio and that the interactions between corruption and public revenues and between corruption and public spending positively influence public debt in the long run. The paper also finds that public debt has a negative effect on economic growth.

Owusu-Nantwi and Owusu-Nantwi (2023) examine the effect of corruption and shadow economy on public debt in 51 African countries. The paper uses the vector error correction model and Kao cointegration test to examine the long-run relationship between corruption, shadow economy and African public debt. The paper finds a positive and statistically significant relationship between corruption and public debt. Further, the paper reports a positive and statistically significant effect of the shadow economy on public debt. In another study, Benfratello et al. (2017) explored the association between corruption and public debt in a diverse sample of both developed and developing countries. The findings revealed that corruption generally leads to an increase in public debt. However, the magnitude of this effect varies across countries, with advanced economies experiencing a stronger impact, while less developed countries exhibit a weaker and less statistically significant relationship.

2.3 Gaps in Literature and Value Addition

The existing body of empirical research on the relationship between external debt, corruption, and economic development reveals a significant literature gap concerning their specific interplay within the ECOWAS region (Ashogbon et al., 2023; Azolibe, 2022; Dawood et al., 2021; Edo et al., 2022; Kingsley, 2023; Thai & Lan, 2022). While some studies examined public debt and economic growth in Africa, the explicit consideration of corruption as a mediating factor remains limited (Amoh et al., 2022; Azam, 2021; Baklouti & Boujelbene, 2020; Setiana et al., 2023; Sinha, 2022; Thomas et al., 2023; Xu et al., 2022). The current state of research within the ECOWAS region

fails to explore the specific nexus between external debt, corruption, and economic development, requiring further investigation (Adeve & Karabou, 2022; Appiah-Kubi et al., 2022; Olaoye, 2023; Olaoye & Olomola, 2023; Oshota, 2023). Moreover, these studies have not adequately explored potential threshold effects or the role of internal factors, including political stability, governance efficiency, revenue generation, and foreign aid, in shaping the relationship between public debt, corruption, and economic development within ECOWAS member states.

Consequently, a substantial literature gap exists in understanding the specific dynamics between external debt, corruption, and economic development in the ECOWAS region, encompassing the mediating role of corruption, the joint effects of corruption and external debt on economic development, and the influence of external debt management strategies on corruption and economic development. Addressing these gaps through further research is crucial for gaining insights into effective policies and strategies that promote sustainable economic development in ECOWAS countries.

3. METHODOLOGY
3.1 Theoretical Framework
The augmented Solow growth model, propounded in 1956 and adopted from the studies conducted by Coupet (2011), modifies the growth model by incorporating the impact of corruption on the level of productivity in order to measure its final effect on economic growth. Suppose an economy which concentrates on the production of a single commodity with a given neoclassical production function:

$$Y_t = K_t^\alpha H_t^\beta \left[A_t(\rho) L_t \right]^{1-\alpha-\beta}, \tag{1}$$

Where Y_t represents the aggregate level of real income, K_t and H_t captures physical and human capital, respectively, A_t is the multifactor productivity level, L_t stands for the labour hours employed and ρ signifies the corruption level, as $A'(\rho) < 0$. Similarly, if $0 < \alpha < 1; 0 < \beta < 1$ and $\alpha + \beta < 1$, hence, the production function is said to exhibit a positive, but diminishing marginal returns to capital and labour, such that:

$$\frac{\partial K}{\partial t} = S_K Y_{t-\delta_K} K_t; \quad \frac{\partial H}{\partial t} = S_H Y_{t-\delta_H} H_t \tag{2}$$

where the exogenous parameters are S_K, S_H, δ_K and δ_H, capturing the proportions of income allotted to physical investment, human capital investment, and depreciation rates of physical and human capital, respectively. The population is assumed to be exogenously determined, and defined as $L_t = L_0 1^{nt}$, assuming that the rate of population growth is constant over time $- \left(\partial L/\partial t \right)/Lt = n^2$. Furthermore, the economic multifactor productivity $- A_t -$ is represented thus:

Also, if At represents the economy's multifactor productivity, then:

$$A_t(\rho) = \overset{\%0}{A_t} 1^{\eta\rho}, \text{ where } 0 \le \rho \le 1 \text{ and } \overset{\%0}{A_t} = A_0 1^{gt}$$

Corruption is incorporated and assumed endogenous in this model deteriorating productivity (see Shittu et al., 2018). This deterioration takes many forms, from the effects of externalities to the diminished quality of inputs. For instance, an organisation that pays a bribe to avoid fines likely reduces its level of investment and may also cause externalities to several other companies. Similarly, when a high-ranking government official attempts to provide public

goods by engaging his unqualified cronies, it reduces productivity in the private sector (Shittu et al., 2018; Tanzi & Davoodi, 1998). Hence, the corruption parameters, ρ and γ, jointly influence the corruption effects on multifactor productivity. ρ measures the country's overall corruption level, while γ estimates the sensitivity of corruption to the production function.

3.2 Model specification
In line with the debt overhang hypothesis and the modified-Solow theory, the model specification for the external debt and corruption–real GDP nexus followed the work of DiPeitro and Anoruo (2012), Fincke and Greiner (2015), and Marmullaku et al. (2021) thus:

$$rgdp = f(dd, cor) \qquad (3)$$

This study employs the panel Autoregressive Distributed Lag (PARDL) technique to examine the association between external debt, corruption and real GDP in ECOWAS countries. Panel ARDL allows us to capture the distinct characteristics of our sample countries and estimate various short-run and long-run dynamics in the relationship between external debt, corruption and real GDP, such that different specifications regarding cross-sectional slope coefficients are easily accommodated (see Salisu et al. 2024). To compare the short- and long-run relationships between external debt, corruption and real GDP, the Pooled Mean Group (PMG) estimator proposed by Pesaran et al. (1999) is favoured over other competing estimators, including Mean Group (MG) and the Dynamic Fixed Effects (DFE) estimators. The attraction to the former is premised on an intermediate estimator that allows the short-term parameters to differ between groups while imposing equality of the long-term coefficients between groups (Bangake & Eggoh, 2012). The short-run coefficient represents the average contemporaneous co-movement of external debt, corruption and economic development in response to shocks, which have struck the economies in the past. Whether this correlation is positive, zero or negative depends on the size and nature of the shocks and the structure of the economy. Therefore, taking into account this specification may provide a better assessment of the long-run coefficient that reflects external debt and corruption influence on economic development or constraint. Thus, we specify the model for the model for the nexus between external, corruption, and real GDP below:

$$\Delta rgdp_{it} = \partial_i rgdp_{i,t-1} + \theta_i + \varphi_i ed_{i,t-1} + \delta_i cor_{i,t-1} + \sum_{j=1}^{r} \pi_{ij} \Delta rgdp_{i,t-j} + \sum_{j=0}^{s} \eta_{ij} \Delta ed_{i,t-j}$$
$$+ \sum_{j=0}^{t} \psi_{ij} \Delta cor_{i,t-j} + \varepsilon_i + \nu_{it} \qquad (4)$$

where $rgdp_{it}$ denotes real GDP indicating economic development (see Adegbite et al., 200014;8; Fodha & Seegmuller, 2014; Szabó, 2013) for the individual country i over a specified period t; is an explanatory variable that denotes the domestic debt for the individual country i over a specified period t; cor_{it} is an explanatory variable connoting corruption index (see Ben Ali & Saha, 2016) for the individual country i over a specified period t; θ_i is the member states-specific intercept; Δ indicates the first difference operator; ε_i is for the country-specific effects; and ν_{it} connotes stochastic disturbance term. Furthermore, the short-run impact of the public debt and corruption on real GDP are η_{1ij} and ψ_{1ij}, respectively. In addition, $-\varphi_{1i}/\partial_{1i}$ and $-\delta_{1i}/\partial_{1i}$ measures the long-run effect of domestic debt and corruption on real GDP, respectively.

3.3 Data and Sources
The secondary data sources are used in this study. The nature of the data is formed by pooling

the cross-section and time series data composed of annual data on real GDP – proxy for economic development – external debt and corruption for the ECOWAS countries. The data spans from 1996 to 2022, and the selected ECOWAS countries include Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. The data on rGDP, ED, and COR are obtained from the World Development Indicators (WDI), African Development Bank (AfDB) and Transparency International (TI), respectively.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Summary Statistics

We provide some statistical characteristics of the series by conducting descriptive statistics – For ECOWAS and each country in ECOWAS – for the analysis (see Table 1 and II). The mean, standard deviation, and the coefficient of variation are the main focus of this analysis. The mean values represent the averages of the series per country, and the standard deviation explains the dispersion of the series around the mean. In contrast, the coefficient of variations explains the volatility of the variables among the countries.

Table I: ECOWAS Region Summary Statistics

Variables	N	Mean	Std. Dev.	cv
rgdp	405	33488.514	92532.717	2.763
eduid	405	0.354	0.116	0.328
incid	405	0.468	0.072	0.154
hdi	405	0.453	0.086	0.19
ed	405	6412.926	11080.215	1.728
dd	405	3473.067	11918.485	3.432
cci	405	-0.591	0.555	-0.938
cor	405	3.057	0.989	0.324

Source: Authors' own work

First, from Table I, on the average, real GDP was $33,488.514, portraying that during the 26 years studied, real GDP recorded in the ECOWAS zone was 33, 488.514 USD. Meanwhile, taking a cursory view of Table 4.2 – where individual country summary statistics were presented – it could be ascertained that Nigeria tops the ECOWAS countries as the economy with the highest real GDP – an average of 351,459.24USD – connoting that Nigeria contributed a chunk to the regional real GDP, establishing why the country is the engine room of the region, having expansive economic fortune and formidable population as disposal fuelling the growth mantra for the nation. Surprisingly, Coted d'Ivoire contributed 3.50 per cent more than Ghana to the region's real GDP, accounting for an average of 38,952.33 USD against Ghana's 37 633.64 USD. Furthermore, from Table II, it is notable that Guinea Bissau is the least real GDP contributor to the region as the country's average real GDP value of 924.29 USD is far below the regional average real GDP. One of the factors that could contribute to this consternation is the inflationary pressures that limited private consumption on the demand side and lower manufacturing and primary sector on the supply side, making the country's inflation rose to

7.9% in 2022 from 3.3% in 2021, driven by higher prices for imported food and oil. After Guinea Bissau, another country that contributed the least to the regional real GDP is The Gambia, with an average of 1,247.05 USD, far less than the regional real GDP average. Going by this, it could be established that the ECOWAS region's large real GDP chunk came from Nigeria, Cote d'Ivoire, and Ghana, constituting 20 per cent of the region states. The regional body has a lot to do to revamp the economic fortune of the region, hence one of the major justifications for a study of this magnitude.

Table II: Individual Country Descriptive Statistics

Country		*rgdp*				*ed*			*cor*	
	N	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV
Benin	27	9539.927	3328.507	0.349	2247.78	1686.238	0.75	3.853	0.778	0.202
B' Faso	27	9331.337	3950.16	0.423	5417.816	4175.248	0.771	3.393	0.619	0.182
C' Verde	27	1439.556	467.84	0.325	1028.454	712.715	0.693	5.073	0.96	0.189
Cd'Ivoire	27	38952.334	12883.432	0.331	15342.75	5490.423	0.358	2.685	0.737	0.274
Gambia	27	1247.053	291.665	0.234	590.542	218.433	0.37	2.984	0.494	0.166
Ghana	27	37633.64	16971.974	0.451	11995.752	11696.741	0.975	3.915	0.457	0.117
Guinea	27	7788.044	2822.504	0.362	2721.857	857.653	0.315	2.012	0.556	0.276
G'Bissau	27	924.294	208.038	0.225	687.82	318.823	0.464	1.892	0.228	0.12
Liberia	27	2268.605	1108.827	0.489	1760.299	1436.581	0.816	2.87	0.598	0.208
Mali	27	10653.964	3634.59	0.341	3436.84	1305.585	0.38	3.193	0.414	0.13
Niger	27	7721.473	3084.171	0.399	2261.626	1174.967	0.52	2.812	0.469	0.167
Nigeria	27	351459.24	133936.4	0.381	36631.459	18499.794	0.505	2.144	0.582	0.271
Senegal	27	15196.484	4938.094	0.325	9065.326	8241.726	0.909	3.7	0.594	0.161
S'Leone	27	3456.563	1337.718	0.387	1380.236	520.088	0.377	2.693	0.425	0.158
Togo	27	4715.189	1484.203	0.315	1625.336	691.447	0.425	2.635	0.368	0.14

Source: Authors' own work

In terms of the real GDP volatility among the Ecowas countries, Guinea Bissau exhibits the least volatile real GDP with 22.5%, whereas Liberia has the top real GDP volatility with 48.9%; hence it can be established that Liberia has a higher degree of variation to its average value of 2,268.61 USD during the study period, which is even higher than the region's 27.63% In a similar manner, some countries have their average real GDP volatility above than the regional average, for instance, it was 38.1%, 38.7%, 39.9%, and 45.1% for Nigeria, Sierra Leone, Niger and Ghana, respectively. This could be adjudged to be caused by different economic and social interplay in the various countries in the region, not limited to political instability, unemployment and inflation. Furthermore, the ECOWAS region has an average external debt in the tune of 6,412.926 USD, asserting that the region relied heavily on loans from international financial houses to sustain and plough the region. However, how this loan is utilised is another perspective for study. Nigeria led the country with the highest external debt as its external debt amounted to 36,631.46USD, followed by Cote d'Ivoire's 15, 342.75 USD and Ghana's 11,995.75USD exposing that the chunk of external debt recorded for the region is heavily from these countries, as The Gambia and Guinea Bissau was the least country with lowest external debt, 590.542USD and 687.83 USD, respectively.

Finally, the region has an average corruption perception of 3.05. The corruption perception index results are given on a scale of 0 (highly corrupt) to 100 (very clean). The corruption perception level portrays the region with a high level of corruption – very corrupt – and looking deeper through individual countries, it could be established that Guinea Bissau and Guinea are the most corrupt countries in the region with 1.89 and 2.012 corruption perception index as The Gambia and Benin are the least corrupt countries with 3.92 and 3.85 corruption perception index, respectively.

4.2 Panel Unit Root Analysis

As a pre-requisite for choosing an empirical model involving large N and T panels, we consider both the stationarity test – Hadri, 2000 LM test – and the nonstationary tests – Harris & Tzavalis, 1999; Breitung, 2000; Levin, Lin & Chu (LLC), 2002; Im, Pesarab & Shin (IPS), 1997 and ADF Fisher tests. The unit root test results, as shown in Table III for Harris & Tzavalis (rho), LLC, Breitung, and ADF Fisher are mixed – [I(0) and I(1)] – while IPS, and Pesaran CD tests are integrated of order zero[I(0)], with Breitung test integrated of order one [I(1)]. Since the underlying framework for estimation allows for the combination of both I(0) and I(1), in so far as the level of stationarity does not exceed I(1), the mixed order of integration for certain variables in the model is not expected to bias our estimates.

Table III: Panel Unit root

Test Method	*lrgdp*	*eduid*	*cor*
Null Hypothesis: Unit Root with common process			
Harris-Tzavalis [rho]	-31.1115***[b]	-2.4244***[a]	-2.8104***[a]
Breitung [t-stat.]	-8.3078***[b]	-10.7904***[b]	-2.0517**[a]
LLC [t*]	-9.0139***[b]	-5.9955***[b]	-1.3458*[a]
Null Hypothesis: Unit Root with Individual process			
IPS (*W Stat*)	-9.2398***[b]	-9.7533***[b]	-10.9626***[b]
ADF Fisher [Chi-square]	-0.5064		2.8515***[a]
Null Hypothesis: Unit Root with cross-sectional dependence			
Pesaran CD test [z[t-bar]]	-2.578***[b]	-2.095*[b]	-3.247***[b]
Null hypothesis: No unit root with common unit root process			
Hadri [Z-stat.]	0.9804[b]	0.9242[b]	-1.9062[b]
Number of Cross-Sections	18	18	18
Number of Periods	192	192	192
Total Number of Observations	3456	3456	3456

Source: Authors' Own Work
Note: a and b denote stationarity at level and first difference, respectively, while ***, **, * indicate statistical significance at 1%, 5%, and 10%, respectively.

4.3 Panel cointegration analysis

Following the outcome of the unit root tests, two-panel cointegration tests (Pedroni and Westerlund) are conducted to examine the long-run relationship between the explained variables –real gross domestic product growth ($lrgdp$) – and the independent variables – external debt (led) and corruption (cor). The cointegration tests were carried out with the test results shown in Table IV.

Table IV: cointegration test

Cointegrating vector:		Panel Specific
Panel means:		Included
Time trend:		Not included
AR parameter:		Panel specific
Test	Statistic	P-value
Modified Philip Perron *t*	2.447	0.0124**

Variance ratio	3.2578	0.0006***

Source: Authors' Own Work
Note: ***, **, * indicate statistical significance at 1%, 5%, and 10%, respectively.

The two cointegration tests (Pedroni and Westerlund) results indicate cointegration among the variables via individual model cointegration tests; hence, the null hypotheses of no cointegration were rejected at 5% under the Pedroni cointegration test, while the rejection was uniform at 1% under Westerlund cointegration test. Therefore, the results signified the long-run equilibrium relationship and further justified the estimation technique employed in this study.

4.4   Panel coefficient estimates
Table V displays the results PARDL techniques employed depicting the short- and long-run coefficient estimation.

Table V: Panel Autoregressive Distributed Lag (PARDL) Model results
Dependent Variable: *lrgdp*

Variables	MG	PMG	DFE
δ^{led}	0.0487 (0.0664)	0.0516 (0.0639)	0.1916 (0.0209)
δ^{cor}	0.0412 (0.0295)	0.0293** (0.0148)	-0.0442 (0.0501)
Constant	-0.102 (0.193)	0.137 (0.126)	1.661*** (0.190)
λ^{led}	0.159 (0.288)	0.404*** (0.0484)	0.3151*** (0.0597)
λ^{cor}	-0.0832 (0.366)	-0.0508 (0.0459)	0.0262 (0.132)
γ^{ect}	-0.0327 (0.0376)	-0.239*** (0.0250)	-0.0229 (0.0247)
Hausman Test (X_k^2)		0.77 (0.6805)	0.108 (0.7842)
N	15	15	15
Observation (NT)	390	390	390

Source: Authors' Own Work
Note: ed is external debt and COR is corruption. $rgdp$ and ed are in logarithmic transformation. The values in parentheses are the standard errors. The $\lambda s'$ are for the long run, while the $\delta s'$ are for the short run. ***, ** & * imply significance at the 1%, 5% and 10% levels, respectively.

The long-run dynamics
The estimated long-run coefficients for the model are reported in Table V, explicitly affirming that in the long run, external debt (ed) and corruption (cor) exert a significant positive and non-significant negative effect on real GDP ($rgdp$), implying that as external debt and corruption practices increase by 1 per cent in the ECOWAS region, it leads to a 0.404 and 0.051 per cent increase and decrease in real GDP, respectively, *ceteris paribus*, establishing that decreasing external debt will result into increase in real GDP. This establishes that as the region government block reduces deficit budget financing by external borrowing, it will reduce the financing of such borrowing, especially in the face of appreciating the US Dollar against the domestic currencies in the ECOWAS region.

Short-run Dynamic

The existence of the speed of adjustment back to long-run equilibrium using the error correction term (ECT) to evaluate the statistical significance of short parameters as observed under the long run. For the error correction term (ECT), the speed of adjustment coefficient is negative and statistically significant as required ($ect_{t-1} = -0.239, p < 0.01$). The coefficient of -0.239 indicates that about 23.9% of the short-run deviations from the long-run, equilibrium is corrected annually. Alternatively, the adjusted is calculated by taking the inverse of the absolute value of the ECT to show how long it takes for the deviations from equilibrium to return back to equilibrium (Pao & Tsai, 2010). Therefore, the adjusted speed for this study is 4 years (i.e., $1/0.239$), which implies that it would take about 4 years and 4 months for short-run deviations from the long-run to be corrected. This indicates that it takes another political change in governance to correct corruption and reduce external debt to improve economic development.

Furthermore, the estimated short-run coefficients for the model exhibited are reported in Table V. The result shows that in the short run, only corruption (cor) had a significantly positive impact on real GDP ($rgdp$). This implies that as corruption practices increase by 1 per cent in the ECOWAS region, it leads to a 0.0293 per cent increase in real GDP, *ceteris paribus*, establishing that an increase in corruption would result into an increase in real GDP. This assertion is against *a priori* expectations as corruption tends to reduce a region's economic development. Meanwhile, this conforms with the submission of Coupet (2011), Huntington (1968) and Leff (1964), Shittu et al. (2018), justified given the alarming rate of corruption in most of these ECOWAS countries. Almost all forms of corruption, ranging from political to economic, have bedevilled both the governance and economic systems; as corruption proceeds are instantaneous, both private and public-sector players engage in any form that anticipates future rent-seeking activities, making it almost become the norms in both public (especially) and private sectors.

5. CONCLUSION AND POLICY RECOMMENDATION

The study examines the relationship among external debt, corruption, and economic development in selected ECOWAS countries from 1996-2022, using the corruption-adjusted augmented Solow and the two-gap theories while employing the PMG estimators of the PARDL technique in estimating the nexus.

Based on the results of the panel analysis, the rising level of external indebtedness in the selected countries is alarming. It has the effect of crowding out public investment due to debt servicing obligations. It also results in capital flight since investors largely avoid the burdens of higher taxes. Given the negative economic consequences, governments should address the menace of rising debt by adopting other capital sources for investment. Such includes more openness of the economies for more capital by easing the restrictions on genuine imports and exports of valuable goods and services. This has the benefits of increasing investment in the domestic economies and creating wealth, as the government would realise tax revenues from imported capital against the payment of interest on external debt. In addition, enhanced economic growth through investment will lead to technology transfer into the domestic economies, with a maximum likelihood of creating employment for citizens.

Similarly, the rising level of corruption in the selected ECOWAS countries should be tackled head-on. The level of corruption, so rampant that public servants see inducements before performing routine functions as a custom, has a severe impact beyond the supposed increased output level. Appropriate policy in this regard requires making integrity and sincerity more attractive, while any act of corruption should be met with severe penalties. Also, the various anti-corruption agencies of governments should be made to perform independently and credibly. A situation where corruption attracts less penalty than the illegal reward obtained would only make corruption largely attractive. In doing this, proper orientation on the adverse

effects of corruption should be extended to the coming generations so that they may be free from seeing corrupt acts as a means to proper livelihood.

In general, empirical findings in this study suggest the need to consciously reduce external borrowing to a sustainable level by the ECOWAS members' state government to mitigate the adverse effects of external debt and associated debt services on economic development. Policy-wise, the members' state government needs to efficiently coordinate and sustainably manage their respective country's external debt, as justified in this current study. Thus, sound and robust external debt management and corruption control significantly impact economic development positively, reducing the corruption perception index, external debt stocks, and total debt services to stimulate sustainable growth in national savings, freeing up resources for investment and capital formation in the long-run.

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