



CORRUPTION, GOVERNMENT SPENDING AND ECONOMIC GROWTH IN SELECTED ECOWAS COUNTRIES

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Abstract

This study investigated the impact of corruption and government spending on the growth of economies in selected ECOWAS countries using dynamic panel econometric procedures. Data covering 2005-2018 was sourced from World Development Indicator (WDI) and Transparency International and subjected to panel unit root tests and Panel Auto-Regressive Distributed Lag (PARDL) estimations. Findings reveal a positive but insignificant effect of corruption on the growth of the economies in the short run, while in the long run the impact is negative and statistically significant. Also, government spending and gross capital formation positively contributed to the growth of the economies in the long run but the effect of openness to international trade is negative. This study recommends that the governments of ECOWAS countries should holistically tackle corruption and re-orientate citizens on the societal value of hard work and integrity as against getting wealth at all cost, especially through public service. Also, the judiciary system should genuinely promote equity and justice without partiality. Also, expansionary fiscal policy should be engaged especially in the time of recession. The governments in ECOWAS countries should focus on capital projects and investments. Funds should be channelled towards improving infrastructure, creating employment opportunities through empowerment programmes, while openness to trade among ECOWAS countries should be treated with caution.

Keywords: *Dynamic Fixed Estimator, Government Spending, Economic Growth, ECOWAS, PARDL*

INTRODUCTION

Undoubtedly, corruption has, for the most part, involved political theory and humanism. Orthodox growth theory never envisaged the inclusion of corruption as having anything to do with economic growth until in the recent time when it was perceived to be an important variable in determining the growth and development of an economy particularly in the less developed countries. Corruption has become one of the commonest enemies that the developing countries are tackling. The reason why anti-corruption agencies are being established across ECOWAS nations is to eradicate or reduce corruption to the barest minimum.



The Economic Community of West African States (ECOWAS) is a sub-continental association of 15 West African countries established on the 28th of May, 1975 (ECOWAS Treaty, 2016). Its main objective is the advancement of the economic reconciliation among its members. ECOWAS is one of the five territorial mainstays of the African Economic People group (AEC). ECOWAS has three authority dialects: English, French and Portuguese with its home office in Abuja, Nigeria (ECOWAS, 2016).

This study focused on 10 out of the fifteen ECOWAS countries, which are: Benin, Burkina Faso, Cote D'Ivoire, Gambia, Ghana, Mali, Niger, Nigeria, Senegal and Sierra Leone. Four of these countries are Anglophone countries (Gambia, Ghana, Nigeria and Sierra Leone) while the other six are Francophone countries. Cape Verde (Cabo Verde), Guinea, Togo, Guinea Bissau and Liberia were exempted due to lack of sufficient data required for the study. All these counties are classified as developing and low income countries. A further socio-economic overview of the selected ECOWAS countries is shown in table 1.

From table 1, data on some economic variables like exchange rate, imports, exports, government expenditure, gross domestic product (GDP) per capita and social variables like population size, main ethnic groups among others are summarised for a brief overview.

Corruption operates in various forms. Ulla Tørnæs, Denmark's Minister for Development Cooperation stated that corruption could be in the form of **bribery and misuse of public funds, appearing as a major obstacle to democracy and economic development in many of the world's poor countries** (Transparency International, 2018). To Montaigne (1580), the corruption of the age constitute the contribution of every individual man; some contribute treachery, others injustice, atheism, tyranny, avarice, cruelty, according to their power. Naskar (2019) stated that in a society where the majority choose charisma over character, democracy does more harm than good to the actual progress of that society and to build a truly civilized society, there is the need for meritocratic government but not democratic government. Ex-Nigeria president, Olusegun Obasanjo, identified corruption as the greatest single bane of today's society (Transparency International, 2018). In this century, corruption is still on the high side and it calls for a holistic attention by all and sundry.

Table 1: Social-Economic Matrix of the Selected ECOWAS Countries

Coun try	Size Squ are km(km2)	Popu latio n (milli on)	Curre ncy/ Main Expor t	Exch ange Rate (1980 - 2018) A=Av erage	Expor t (billio n \$) (1980- 2018) A=Av erage	Impo rt (billio n \$) (1980- 2018) A=Av erage	GDP (billion \$) (1980- 2018) A=Ave rage	GDP Per Capita in \$US (1980- 2018) A=Ave rage	Capital/ Geograp hy	Aggregate Governm ent Expendit ure (billion \$) A=Averag e	Main Ethnic Group
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				C=Cu rrent	C=Cu rrent	C=Cu rrent	C=Cur rent	C=Cu rrent		C=Curre nt	
Beni n	114, 763	11.63	C= CFA FRAN C ME=C otton	A=46 1.95 C=51 4.26	A=86 6.09 C=1.9 74	A=12 40.02 C=2.7 87	A=405 9.86 C= 27.568	A=515 .68 C= 923	Port- Novo/ Latitude 6°and 13°N and longitude s 0°and 4°E	A=3644.9 5 C=2.152	1=Fon 2=Yorub a 3=Adja 4=Bariba
Burk ina Faso	274, 200	19.75	C=CF A FRAN C ME= Gold	A=46 0.83 C=49 9.71	A=2.9 C=3.1 4	A=2.5 C=3.3 05	A=10.6 C=12.6	A=660 C=790	Ouagado ugou/ 12.2383° N, 1.5616° W	A=11.43 C=3.655	1=mossi 2=Bobo- dioulasso
Cote D'Iv oire	322, 463	24.91	C= CFA FRAN C ME=C ocoa Beans	A=56 2.53 C=56 8.53	A=10. 7 C=11. 8	A=8.0 1 C=8.7 9	A=87.8 5 C=96.2 7	A=375 0 C=3,90 0	Abidjan/ Latitude and Longitud e is 08° 00' N and 05° 00' W	A=4.32 C= 4.58	1=Akan 2=Krou 3=Lobi
Gam bia	10,6 89	1.88	C=Dal asi(G MD) ME=P eanuts	A=55. 69 C= 65.68	A=30 4.51 C=13 2	A=64 3.21 C=20 1	A=231. 55 C=1.04 0	A=115 9.87 C=170 0	Banjul/ 13.4432° N, 15.3101° W	A=5647.6 3 C=7.336	1=fula 2=wolof 3=jola
Gha na	238, 533	29.61	C=Ce di	A=37 4.781	A=3.7 USD	A=2.7 1 USD	A=10.8 5	A=104 9.41 USD	Accra 7.9465°N	A=3.38 GHS	1=akan 2=ewe 3=guan



			ME=	C=61	C=13.	C=12.	C=145.	C=1.78	1.0232 ⁰	C=12.36	
			Gold	61.03	84	65	768	6	W	GHS	
Mali	1.24	18.5	C=CF	A=34.	A=61.	A=45	A=34.2	A=25.	Bamako/	A=1645.4	Bambara
	m		A	67	45	6.3	3	34	17.5707 ⁰	2	,
			franc						N,	C=655.21	Fulani
			ME=	C=4.2	C=2.4	C=8.9	C=4.60	5.43	3.9962 ⁰		
			Gold	3	3	5			W		
Niger	1.26	21.6	C=CF	A=58	A=62.	A=31	A=81.2	A=623	Niamey/	A=6844.2	Hausa,
	7m		A	9.23	32	4.11	4	.34	17.6078 ⁰	1	Zarma
			franc						N,	C=546.98	, Tuarea
			ME=	C=4.5	C=4.3	C=71.	C=6.71	C=7.69	8.0817 ⁰		
			Urani	6	4	11			W		
			um								
			Ore								
Nigeria	923,	197.0	C=Nai	A=92.	A=40	A=20	A=97.5	A=166	Abuja	A=1316.2	1=Yorub
	768	5	ra	07	3.1	1.10	2	1.41	9.08 ⁰ N,	8	a
			ME=	C=36	NGN	NGN	C=375.	C=241	8.6753 ⁰	C=795.88	2=Hausa
			Oil	0.42		C=59	7	2.41	E	NGN	3=Igbo
					C=14	4.58		USD			
					82.2	NGN					
					NGN						
Senegal	196,	16.40	C=CF	A=48	A=10	A=24	A=5.50	A=943	Dakar	A=6323.5	Wolof,
	722		A	1.70	3.15	1.9		.25	14.4974 ⁰	4	Fula,
			FRAN		CFA	CFA		USD	N,	C=7.46	Serer,
			C	C=54			C=16.3	C=113	14.452 ⁰ W		Jola
			ME=	8.97	C=17	C=38		4.10			
			Oil		7	9.4		USD			
					CFA	CFA					
Sierra Leone	71,7	6.19	C=Le	A=45.	A=32.	A=76.	A=6.56	A=4.5	Freetown/	A=4534.6	Temme,
	40		one(S	6	26	9		6	8.4606 ⁰ N	0	Mende,
			LL)				C=3.23			C=723.10	Limba
			ME=R	C=6.9	C=9.2	C=2.3		C=7.53	11.7799 ⁰		
			utile	6	7	9			W		

Sources: Index mundi, Google, Worldometer and Worldatlas, 2019



Open corrupt practices are evident. For instance, stories of how politicians and public officers alike embezzle money are heard all over. The consequence of these phenomena on the economy needs to be empirically unbundled. The findings from earlier studies are mixed, thus giving room for further investigation. For instance, Mo (2001) discovered that the most significant channel through which corruption influenced monetary development was political shakiness and that corruption diminishes the degree of accumulation of human capital and the portion of investment by the private sector. Thach, Duong and Oanh (2017), argue that corruption impacted positively on economic growth at the quantile level from 0.1 and 0.5, but negatively from level of 0.75 and 0.90. According to Ondo (2017), corruption favoured the growth of the economies in the Central African Economic and Monetary Community (CEMAC) member countries.

In the study by Mauro (1998) corruption was noted to impede government spending on education. Ghalwash (2014) suggested that corruption expands wasteful aspects in government consumption and lessens speculation and human capital, prompting a negative effect on productivity. Hoinaru, Buda, Borlea, Vaidean and Achim (2020) found that 'shadow economy' and corruption were forms of diseases which were poverty-driven and that they were prominent with low-income countries. Alege, Adamu & Audi (2014) showed that there had been noteworthy decreases in the level of corruption in the nation through the efforts of the government against corruption while a negative relationship was found between levels of corruption and the growth of the economy. Jajkowicz and Drobiszova (2015) found that government spending on defence and administrations expanded, while government spending on health, education, culture, religion and recreation declined with greater levels of corruption. Besides these mixed results, studies that investigated the dynamic interrelationship among corruption, government spending and economic growth focusing on ECOWAS countries is sparse, hence this serve as a motivation for this study.

Therefore, this study examined the relationship between corruption, government expenditure and the growth of the economy in ten selected ECOWAS countries for the period 2005-2018. Besides this introductory section, section 2 gives an overview of the socio-economic variables of the selected ECOWAS countries. Section 3 contains review of related literature While section 4 shows the data and econometric techniques employed and section 5 contains the results of the analysis of data. The 6th section concludes the study.

LITERATURE REVIEW

This section reports the review of the conceptual, theoretical and the empirical literatures with a view to bringing to limelight, the existing knowledge of the subject of interest in this study.

Conceptual Review of Literature

The concept of corruption has diverse meaning as defined by many authors. To Montaigne (1580), corruption of the age constitute the contribution of every individual man as some contributed treachery, others injustice, atheism, tyranny, avarice, cruelty, according to their power. Ulla Tørnæs, Denmark's Minister for Development Cooperation stated that corruption could be in the form of **bribery and misuse of public funds** (Transparency International, 2018). Morris (1991) described political corruption as the illegitimate use of public power to benefit a private interest while Senior (2006) defined corruption as an act to secretly provide a good or a service to a third



party with a view of influencing certain actions which benefit the corrupt, a third party, or both in which the corrupt agent has authority. *Kaufmann & Vicente (2005)* stated that the concept of corruption involves a situation in which power is abused within the confines of the law, as people with power often have the ability to make laws for their protection. In the execution of public projects, the effect of corruption in infrastructure is to increase costs and construction time, lower the quality and decrease the benefit (*Locatelli, Mariani, Sainati & Greco, 2017*).

In this study, it can be summarily stated that, corruption envelopes every deviant behaviour from good moral, justice, professional and ethical practices, and merit choices of individual, groups, government and government officials. It entails treachery, injustice, atheism, tyranny, avarice, cruelty, **bribery, misuse of public funds**, illegitimate use of public power to benefit a private interest, a situation of abuse of power in the confines of the law, unjust increase in costs and construction time of public projects.

Theoretical Review

Various theoretical issues around corruption, government expenditure and economic growth were reviewed. One of them is a policy situated hypothesis of corruption created by Tevfik, Albert and Charles (1986). The hypothesis opines that elevated levels of corruption in any nation, regardless of whether created or creating, won't permit the nation's economy to develop. Points of view from political theory and economics propose a coordinated hypothesis of administrative corruption. Corruption as a procedure impacts the ideal degree of social welfare. Hypothesis of corruption depends on the dictatorship of the decision class of certain nations. At this level, the decision class utilises the state device as the means for separating riches from the general public. The few individuals are becoming richer while the state is becoming poorer and weaker as a result of diversion of resources meant for state advancement to individual coffer.

Some theories of public expenditure as postulated by economists include the Wagner's law of expanding state exercises which holds that for any nation, open expenditure rises continually as pay growth extends. The law predicts that the advancement of a mechanical economy will be joined by an expanded portion of open expenditure in net national item. Colin Clark's Basic Farthest point Theory, which was created after the Subsequent Universal War, is essentially worried about the resistance level of taxation (Pechman & Mayer, 1952). Clark needs to call attention to that in an economy; expansion develops when the portion of the government area, as estimated as far as assessments and different receipts, surpasses 25 per cent of the amassed economic movement in the nation.

Thinking about the theory of 'Maximum Social Advantage' postulated by Erik Lindahl in 1919, determination of public expenditure and taxation would happen on the basis of public preferences which they would reveal by themselves. Cost of supplying a good would be taken up by the people. The tax that they would pay would be revealed by them according to their capacities (Lindahl, 1958)

Empirical Review of Literature

Empirically, different scholars have investigated corruption, government expenditure and economic growth in various economies. Studies like Glaeser and Goldin (2006) contended that



corruption in America had been reducing throughout the previous 150 years and it's a lot of lower in ongoing decades than anytime in U.S. history. In an investigation by Ratbek (2013), the results indicated that growth rates within the sight of corruption are problematic.

Mo (2001) examined the role of corruption in the growth of the economy and gave quantitative assessments of the effect of corruption on the growth and the significance of the transmission channels. Utilising ordinary least squares estimations, the author found that a one-unit increment in the corruption index lessens the growth rate by 0.545 per cent. The most significant channel through which corruption influenced the growth of the economy was political instability and it represented about 53% of the total impact. It was further found that corruption diminishes the level of human capital and the portion of private investment.

Thach, Duong and Oanh (2017) analysed the effect of corruption on the growth of the economy by utilising data of 19 Asian nations for the period of 2004-2015 with DGMM data handling procedures and quantile regression. The results revealed that corruption was an impediment to the growth of the economies of those Asian nations. Moreover, economic growth was affected by various levels of corruption at various quantiles, explicitly, at the quantile level from 0.1 and 0.5. Corruption influenced economic growth positively, while from level of 0.75 and 0.90, it was negative. Furthermore, the investigation found that quality of the institution, economic and democracy freedom are vital in economic advancement.

Ondo (2017) analysed the connection among corruption and growth of the economy in the nations of the Economic and Monetary Community of Central Africa (EMCCA). The authors utilised panel econometrics to show that over the examination time frame (2005 to 2015), corruption had supported the growth of the economies in the CEMAC member nations by "brushing" the administrative burdens influencing access to public services (electricity, water, public hospitals and public schools), the establishment and advancement of private enterprises.

Ghalwash (2014) empirically considered the direct and indirect effect of corruption on the growth of the economy by adopting the corruption index in the growth model concentrating on Egypt. The model gave a basic hypothetical structure where the level of corruption as well as the impacts of corruption on productivity factors like foreign direct investments, receptiveness, government spending and political instability were recognised. The results gave experimental proof recommending that corruption expands wasteful aspects in government spending and decreases investment and human capital, prompting a negative effect on output. Moreover, the human capital, transparency and political instability were the most significant channel factors, through which corruption influences growth.

Hoinaru, Buda, Borlea, Vaidean and Achim (2020) tried to discover the way by which shadow economy and corruption impact on economic and sustainable development. A large cross country data of 185 nations was utilised for the period 2005–2015. The results revealed that corruption and shadow economy were forms of diseases that were poverty-driven and they were prominent in low-income nations. The higher levels of corruption and shadow economy were connected with low level of economic and sustainable development. In any case, they additionally discovered evidence that corruption could be viewed as an approach to bypass the law so as to accomplish higher economic benefits and increase economic development. They additionally found that



economic and sustainable development in high-income nations was negatively influenced by corruption and shadow economy than in low-income nations.

Alege, Adamu & Audi (2014) provided a review of Nigeria's recent experience on corruption with regards to economic development. It examined the potential circumstances and end results of corruption, which apparently was established in cultural and social practices and the political and economic condition of the nation. Data were sourced from news stories and interviews of Nigerians with relevant information. The investigation revealed that there had been critical decreases in the degree of corruption in the nation through the anti-corruption agents of the government. Also, the study discovered a negative correlation between levels of economic growth and corruption. They further found that corruption created negative national image and loss of income. It depreciated the value of human life, robs schools, welfare services, agricultural sectors and hospital of funds.

Jajkowicz and Drobiszova (2015) empirically examined the impact of corruption on the allocation of government spending by function. Pooled panel data set for 21 OECD nations covering the period 1998 to 2011 were sourced and used in this study. The discoveries indicated that government spending on protection and administrations of the public service expanded, while spending of the government on health, education, religion, recreation and culture declined with increased levels of corruption. This study further discovered new evidence and proof on the connection between government spending allocation and corruption in OECD nations.

Johnny, Markjackson and Timipere (2018) examined the impact of government social spending on the growth of the economy in Nigeria from 1981 to 2016. The authors utilised three explanatory factors (health expenditure, education spending and social services and community expenditure) and one dependent variable (agribusiness productivity). Unit root, co-integration and causality tests were carried out and ordinary least square estimation technique was adopted. The findings from the study showed a positive and significant effect of health expenditure on agricultural output. There was negative and insignificant effect of education expenditure on agricultural output. There was positive and statistically significant effect of community and social services spending on agricultural productivity. It was recommended that, government at all levels should adopt policies that would support improvement in facilities used for health and also that improvement in social and community services should be worked on by the government.

Mauro (1998) investigated if predatory behaviour by politicians that are corrupt distorted the government spending composition or not. The outcome from the study showed that corruption reduced the spending of the government on education. Another investigation by Shusheng et al (2017) on the Chinese economy in one of its discoveries proposed that expanded corruption levels can straightforwardly lessen factor efficiency.

d'Agostino, Dunne and Pieroni (2016) studied 48 African countries and found a negative impact of spending on the military and corruption on the growth of the economy. In another study by Ratbek (2013), the results showed that growth rates in the presence of corruption are sub-optimal.

METHODOLOGY

Model Specification

This study hangs on the modified Cobb-Douglas approach to output growth as defined in the production theory taking after d'Agostino, Dunne and Pieroni (2016). This is specified as:

$$y_t = f(k_t, g_t) = Ak_t^{1-\alpha} g_t^\alpha \quad (1)$$

Where y_t is output, k_t is physical capital and g_t is government expenditure. The parameter (α) is the input productivity in respect of government expenditure while $(1 - \alpha)$ is the input productivity in respect of physical capital. In this model, public spending is assumed to be productive, such that it was a factor of production and it is thought to be exogenous to the representative variable and financed by a consistent annual tax rate (τ) such that

$$G_t = \tau_{yt}, \quad 0 < \tau < 1 \quad (2)$$

As $\tau \frac{G_t}{y_t}$ represents the portion of government expenditure in productivity, it may imply the size of the government in the economy. Further, the government may utilise the aggregate sum of taxes collected (τ_{yt}) to finance total spending of the government (g), as shown in equation (3)

$$g_i = \phi_i \tau_{yt} \quad (3)$$

Where ϕ_i represents the portion of government spending that is allocated to the i^{th} government expenditure aggregated as g in this case, see Barro (1990). Therefore, government spending can be viewed as beneficial in affecting growth. Moving to bring corruption into the growth model, it can essentially be treated as a relative assessment on pay as in Mauro (1998). To account for the effect of corruption, (h) is included among the parameters to show the effect of corruption in influencing the productivity of government expenditure as shown in equation (4)

$$g_h = \tau_{yt} \quad (4)$$

Where h represent corruption. The functional form of the model is specified in equation (5)

$$RGDPPC = f(COR, RGCEPC, RGCFPP, EDU, TOPEN) \quad (5)$$

Re-expressing equation 5 in Cobb-Douglas production format and indicating the type of data to be used, equation (6) is specified;

$$RGDPPC_{it} = A (RGCFPP_{it}^{\beta_1}) (RGCEPC_{it}^{\beta_2}) (COR_{it}^{\beta_3}) (EDU_{it}^{\beta_4}) (TOPEN_{it}^{\beta_5}) \quad (6)$$

Where i and t represent countries and time period respectively, and

$$\beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 < 1$$

$RGDPPC_{it}$ is the Real Gross Domestic Product per capita value for country i during period t . This is the economic growth variable.

COR_{it} is the corruption perception index for country i during period t .



$RGCEPC_{it}$ is real government final consumption expenditure per capita for country i at time t
 $RGCFPP_{it}$ represents real gross capital formation per capital for country i at period t
 EDU_{it} represents Basic Education proxy by primary school enrolment as percentage of gross for country i at period t
 $TOPEN_{it}$ represents trade openness measured as the sum of exports and imports taken as a percentage of gross domestic product (GDP) for country i at period t

The inclusion of education (EDU) and trade openness (TOPEN) is informed by the findings of Kobzev, Procházka, Smutka, Maitah, Kuzmenko, Kopecká & Hönig (2018) that education matters for economic growth and the result from the study by Keho (2017) that trade openness matter both in the short and long run to the growth of its economy.

Linearizing equation 6 and adding the error term e_{it} , the model therefore is expressed in an econometric form:

$$\ln(RGDPPC_{it}) = \beta_0 + \beta_1 \ln(RGCFPP_{it}) + \beta_2 \ln(RGCEPC_{it}) + \beta_3 \ln(COR_{it}) + \beta_4 \ln(EDU_{it}) + e_{it} \quad (7)$$

e_{it} is the error term for country i during period t , $\beta_0 = \ln(A)$ where A_i is technology and with the assumption that technology is constant, β_0 is constant and represents the intercept of the model. $\beta_1, \beta_2, \beta_3$ and β_4 are the slopes of explanatory variables, while the apriori expectations are $\beta_1 > 0$; $\beta_2 > 0$; $\beta_3 < 0$; $\beta_4 > 0$

Sources of Data and Estimation Technique

This study makes use of panel data on corruption, government expenditure, gross capital formation and economic growth for some selected ECOWAS countries. Panel data for 10 of ECOWAS countries spanning between 2005 and 2018 was used. Data were sourced from World Development Indicator (WDI), Worldometer and Transparency International. Data on general government final consumption expenditure, Gross Domestic Product and Gross Capital Formation were obtained from the latest World Development Indicator (WDI) while the data on Corruption Perception Index was obtained from Transparency International.

Panel unit root tests by Levin, Lin and Chu (2002) and Im, Peseran, and Shin (2003), and Panel Auto-Regressive Distributed Lagged (ARDL) are the estimation techniques.

Measurement of Variables

General government final consumption expenditure in units measured in constant US\$ was used for each country so as to avoid discrepancies of currency and to have the data in real terms. GDP (Gross Domestic Product) constant US\$ was used to measure economic growth for each of the selected ECOWAS country also. Gross Capital Formation in constant US\$ was introduced as a control variable.

To obtain each of the variables, real general government final consumption expenditure, real gross domestic product and real gross capital formation in their per capita form, population values for each of the countries was sourced for each of the countries. The per capita values finally used for estimation were obtained by dividing each of the variables by the population for each country.



Corruption Perception Index (CPI) is measured as an index for corruption in the ECOWAS countries. For years from 2005 to 2011, CPI was measured on a scale from 0 to 10 on Transparency International, where 0 was to be used to denote the highest level of corruption and 10 for the cleanest (non-corrupt case). However, years from 2012 to 2018 were scaled from 0 to 100 with the same interpretation. In order to have a uniformed measurement for Corruption Perception Index, years from 2005-2011 were converted to 100.

RESULTS AND DISCUSSIONS

This section presents the empirical results starting with the pre-estimation tests which include the test for the descriptive statistics of the series in the variables, the unit roots tests and the choice of lag length for the model estimation.

Descriptive Statistics Tests of the Series

This subsection reports the descriptive statistics of the series adopted in the variables of interest. The variables include corruption index (*LCOR*), education (*LEDU*), capital formation per capita (*LRGCFPC*), economic growth (*LRGDPPC*), government consumption spending per capita (*LRGGFCEPC*) and openness to international trade (*LTOPEN*). The result of the descriptive test is presented in table 2.

Table 2: Results of the Descriptive Statistics

	<i>LCOR</i>	<i>LEDU</i>	<i>LRGCFP</i> <i>C</i>	<i>LRGDPP</i> <i>C</i>	<i>LRGGFCEP</i> <i>C</i>	<i>LTOPEN</i>
<i>Mean</i>	3.422808	4.482078	5.164613	6.761302	4.618615	4.106336
<i>Median</i>	3.417592	4.450255	5.159103	6.662461	4.675764	4.083348
<i>Maximum</i>	3.871201	4.886332	6.220495	7.849285	5.409440	4.766826
<i>Minimum</i>	2.944439	3.878600	3.577218	5.787532	3.542404	3.437998
<i>Std. Dev.</i>	0.218046	0.206824	0.554215	0.556162	0.461833	0.308748
<i>Skewness</i>	-0.139143	-0.239511	-0.509780	0.088270	-0.513679	0.007193
<i>Kurtosis</i>	2.474043	3.158539	3.540847	2.162782	2.395955	2.494338
<i>Jarque-Bera</i>	2.065430 *	1.485143 *	7.770105 *	4.270584 *	8.285296*	1.492758 *
<i>Probability</i>	0.356039	0.475888	0.020547	0.118210	0.015881	0.474080
<i>Observations</i>	140	140	140	140	140	140



NB: * denotes normal distribution at 1 percent

Source: Authors' Compilation, 2019

From table 2, the results show that the measures of central tendency (mean and median) display moderate values. The mean values range between 3.422808 (*LCOR*) and 6.761302 (*LRGDPPC*), while the median is between 3.417592 (*LCOR*) and 6.662461 (*LRGDPPC*). Also, the minimum and the maximum values reveal absence of outlier in the series. Also, the measure of dispersion (standard deviation) has low value. The standard deviation values ranges between 0.206824 (*LEDU*) and 0.556162 (*LRGDPPC*).

Considering the normality assumption using the Jacque-Bera statistic, which was derived using Skewness and kurtosis results, table 2 shows that all the series in the variables are normally distributed either at 1 per cent of 5 per cent levels of significance. Specifically, gross capital formation (*LRGCFPC*) and government consumption expenditure (*LRGGFCEPC*) are normally distributed at 1 per cent, while the remaining variables are normally distributed at 5 per cent as shown by the probability values. The essence of testing whether the normality assumption is satisfied or not is the fact that other statistics like chi-square, t-statistic, F-statistic among others, assumed that the series in the variables are normally distributed for them to be valid (Adedeji, 2015).

Test for Stationarity (Panel Unit Root Tests)

In testing for stationarity, two panel unit root tests were adopted: Levin, Lin and Chu (2002) and Im, Peseran, and Shin (2003). The results for the panel unit root tests are reported in table 3. The order of integration [I(d)] indicates the number of times each variable has to be differenced before they are stationary. Using 5 per cent level of significance, the results revealed that not all the series of the variables are stationary at level. The economic growth variable (*LRGDPPC*) and the government consumption expenditure variable (*LRGGFCEPC*) were stationary at first difference under both Im, Peseran, and Shin (IPS) as well as Levin, Lin and Chu (LLC) unit root tests. Also, education variable (*LEDU*) is consistently stationary at level under both IPS and LLC unit root tests.

Table 3: Results of Panel Unit Root Tests Levin, Lin and Chu and Im, Peseran, and Shin

Variables	Levin, Lin and Chu (LLC)		I(d)	Im, Peseran, and Shin (IPS)		I(d)
	Level with Intercept	1 st Diff. with Intercept		Level with Intercept	1 st Diff. with Intercept	
<i>LCOR</i>	-1.90375* (0.0285)	---	I(0)	-0.04013 (0.4840)	-4.67515* (0.0000)	I(1)



<i>LEDU</i>	-5.31104*	---	I(0)	-3.03733*	---	I(0)
	(0.0000)			(0.0012)		
<i>LRGCFPC</i>	-2.37841*	---	I(0)	-0.72432	-4.23359*	I(1)
	(0.0087)			(0.2344)	(0.0000)	
<i>LRGDPPC</i>	0.57039	-3.98014*	I(1)	3.28427	-1.96859*	I(1)
	(0.7158)	(0.0000)		(0.9995)	(0.0245)	
<i>LRGGFCEP</i> <i>C</i>	-0.73254	-7.14663*	I(1)	0.56168	-4.81731*	I(1)
	(0.2319)	(0.0000)		(0.7128)	(0.0000)	
<i>LTOPEN</i>	-1.91536*	---	I(0)	0.48769	-2.62629*	I(1)
	(0.0277)			(0.6871)	(0.0043)	

NB: *indicates significance at 5 percent. Probabilities in parenthesis. Diff means difference

Source: Authors' Computation, 2019

However, the results of IPS and LLC unit root tests are not the same for corruption (*LCOR*), gross capital formation (*LRGCFPC*) and trade openness (*LTOPEN*) variables. The IPS unit root test results for the variables reveal stationarity at level, I(0), while LLC unit root test results show stationarity at first difference, I(1). Considering the homogeneous slope assumption of LLC test and the heterogeneous slope assumption of the IPS tests, *LCOR*, *LRGCFPC* and *LTOPEN* are considered to be stationary at first difference, I(1) following the LLC unit root test.

This result implies that running a regression analysis on these variables using the Ordinary Least Square technique can generate spurious results, as some of the traditional Least Square assumptions have been violated. Thus, the study considered Panel Auto-Regressive Distributed Lag (ARDL) estimation technique as an appropriate method. This is informed by the mixed results from panel unit root tests, I(0) and I(1).

Determination of the lag-length and Long run relationship of the Variables

To adopt the Panel Auto-Regressive Distributed Lag (PARDL) estimation technique, the lag length required needs to be determined. The test result for the optimal lag length selection criterion is presented in table 4.

Table 4: Result of Optimal Lag Length Selection for Dependent Variable *Log (RGDPPC)*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-25.39142	NA	0.122089	0.734785	0.853887	0.782537
1	136.3897	303.3396*	0.002193*	-3.284742*	-3.135865*	-3.225053*
2	137.1101	1.332841	0.002209	-3.277753	-3.099101	-3.206127
3	138.3569	2.275333	0.002195	-3.283922	-3.075495	-3.200358
4	138.6635	0.551904	0.002234	-3.266588	-3.028385	-3.171085
5	139.0382	0.665141	0.002270	-3.250956	-2.982978	-3.143516

NB: *indicates lag order selected the criterion

LR: Sequential modified LR test statistic (each test at 5% level), Table 7 presents the result of optimal lag selection based on different criterion such as, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information and HQ: Hanna-Quinn information criterion.

Source: Authors' Compilation, 2019

From table 4, the lag length of 1 is obtained, following the result of different criterion such as Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information (SC) and Hanna-Quinn (HQ) information criterion. This implies that in the proposed Panel ARDL technique of estimation, the optimal lag length adopted is 1.

In testing for cointegration, the Kao Residual cointegration test is adopted and the results are reported in table 5.

The result in table 5 shows that the probability value from the ADF equation is less than 5 per cent level of significance ($0.0492 < 0.05$), it signifies that the null hypothesis is rejected. Thus, there is the presence of long run relationship among the variables.

Table 5: Kao Residual Cointegration Test Result.

	t-Statistic	Prob.
ADF	-1.652353	0.0492
Residual variance	0.001686	
HAC variance	0.002584	

Source: Authors' Compilation, 2019



Effects of Corruption and Government Spending on Economic Growth

To determine the short and long run effects of corruption and government spending on economic growth in the selected ECOWAS countries, the Panel Auto-Regressive Distributed Lag (P-ARDL) technique of estimation was employed and the results presented in table 6..

The Long Run Results

The long run results in the first segment of table 6 reveal that government spending (*LRGGFCEPC*) has a positive and statistically significant [$\text{Pr.}(t)=0.0000<0.05$] effect on economic growth (*LRGDPPC*) at 5 per cent level of significance. When government spending increases by 1 per cent, the growth of the economy increases by 0.537 per cent. On the other hand, the corruption index (*LCOR*) has positive and statistically significant [$\text{Pr.}(t)=0.0003<0.05$] effect on economic growth and implies that corruption has negative and statistically significant effect on economic growth, since corruption index and corruption are inversely related.

Table 6: Results of Panel ARDL on the Effects of Corruption and Government Spending on Economic Growth

Method: *ARDL*; **Dependent Variable:** *D(LRGDPPC)*;

Model selection method: Akaike info criterion (AIC); Included

Obs.: 130

Dynamic regressors: *LRGGFCEPC LTOPEN LRGCFCPC LCOR*

Selected Model: *ARDL(1, 1, 1, 1, 1)* Fixed regressors: *LEDU*
C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
<i>LRGGFCEPC</i>	0.537297	0.075998	7.069865	0.0000
<i>LTOPEN</i>	-0.081734	0.039507	-2.068830	0.0425
<i>LRGCFCPC</i>	0.221892	0.033857	6.553700	0.0000
<i>LCOR</i>	0.255687	0.067332	3.797405	0.0003
Short Run Equation				
<i>COINTEQ01</i>	-0.214898	0.074068	-2.901361	0.0050
<i>D(LRGGFCEPC)</i>	.0071256	0.052082	-1.368140	0.1759
<i>D(LTOPEN)</i>	-0.032755	0.050016	-0.654893	0.5148
<i>D(LRGCFCPC)</i>	0.027827	0.035163	0.791373	0.4316
<i>D(LCOR)</i>	-0.006960	0.025794	-0.269845	0.7881
<i>LEDU</i>	0.005685	0.079241	0.071738	0.9430
<i>C</i>	0.551985	0.484005	1.140453	0.2582
Mean dependent var	0.019196	S.D. dependent var	0.040202	
S.E. of regression	0.029931	Akaike info criterion	-4.554055	



Sum squared resid	0.059127	Schwarz criterion	-2.999186
Log likelihood	392.7838	Hannan-Quinn criter.	-3.922203

**Note: p-values and any subsequent tests do not account for model selection*

Source: Authors' Compilation, 2019

Therefore, a one (1) per cent reduction in corruption will raise economic growth by 0.256 per cent. Also, gross capital formation (*LRGCFPC*) has a positive and strong statistically significant effect on economic growth at 5 per cent level of significance, while trade openness (*LTOPEN*) has negative and statistically significant effect on economic growth at 5 per cent level of significance. When gross capital formation increases by 1 per cent, the growth of the economy increases by 0.222 per cent, but when trade openness increases by 1 per cent, economic growth will reduce by 0.082 per cent.

The Short Run Results

The short run results in the second segment of table 6 show that the coefficients of cointegration or the error correction term (*COINTEQ01*) is statistically significant at 5 per cent and negative. The negative sign indicates a backward movement toward long run equilibrium from short run disequilibrium and the speed of adjustment is about 21%. Also, the corruption index [*D(LCOR)*] which has negative and statistically insignificant [$\text{Pr.}(t)=0.7881>0.05$] effect on economic growth implies that corruption has positive effect on economic growth as the corruption index and corruption are inversely related, but the effect is not statistically significant. A 1 per cent increase in corruption will raise economic growth by 0.00696 per cent. In addition, government spending [*D(LRGGFCEPC)*] has a negative and insignificant [$\text{Pr.}(t)=0.1759>0.05$] effect on economic growth (*LRGDPPC*) at 5 per cent level of significance. When government spending increases by 1 per cent, the growth of the economy decreases by 0.071256 per cent.

Also, gross capital formation [*D(LRGCFPC)*] has a positive but statistically insignificant [$\text{Pr.}(t)=0.4316>0.05$] effect on economic growth at 5 per cent level of significance, while trade openness [*D(LTOPEN)*] has negative and statistically insignificant [$\text{Pr.}(t)=0.5148>0.05$] effect on economic growth at 5 per cent level of significance. When gross capital formation increases by 1 per cent, the growth of the economy increases by 0.027827 per cent, but when trade openness increases by 1 per cent, economic growth reduces by 0.032755 per cent. The effect of basic education (*LEDU*) on economic growth (*LRGDPPC*) is positive but not statistically significant at 5 per cent level of significance.

Discussion of Empirical Results

This study has examined the effects of corruption and government expenditure on economic growth in some selected ECOWAS countries. The variables of interest include corruption, basic education, capital formation per capita, economic growth, government consumption spending and openness to international trade. All the series in the variables are normally distributed using Jacque-Bera statistic, hence, the statistics like chi-square, t-statistic, F-statistic among others, are valid to be engaged. Also, using panel unit root tests of Levin, Lin and Chu (2002) and Im, Peseran,



and Shin (2003), basic education is stationary at level, $I(0)$, while corruption, government consumption expenditure, gross capital formation, economic growth and trade openness are stationarity at first difference, $I(1)$. Based on this mixed results, Panel Auto-Regressive Distributed Lag (ARDL) estimation technique was adopted. Also, Kao Residual cointegration test revealed that the variables are related in the long run.

Empirically, in short run corruption supported economic growth though insignificantly, but significantly impeded economic growth in the long run. The negative effect of corruption on economic growth corroborates the findings of Andrzej and Łukasz (2018), Serena, Giovanni and Alberto (2018) and d'Agostino et al. (2016). Also in the long run government spending significantly promotes economic growth. This finding supported the Keynesian (Spend-Growth) hypothesis, where an increase in government expenditure is expected to raise the GDP growth rate. This means that an increase in the spending of the governments in ECOWAS countries will raise the level of growth of the economies in the long run.

Similarly, the gross capital formation significantly raised economic growth. This result is in accordance with the Harrod-Domar Growth Model, which suggests that an increase in savings leads to an increase in investment (Gross Capital Formation), and in turn boosts economic growth. This means that an increase in gross capital formation will increase the level of economic growth in the long run. However, openness to international trade negatively affects the growth of the economies in the long run.

CONCLUSION AND RECOMMENDATIONS

The arrogating undue honour to the wealthy, as poverty is ravaging world and more specifically Africa, is a concern. Becoming rich by all means, particularly through public office holding, appears to have promoted corrupt practices. Having examined the effects of corruption and government expenditure on economic growth in ECOWAS countries, it can be concluded that both corruption and trade openness significantly impede economic growth, while government spending and gross capital formation significantly promotes economic growth in ECOWAS countries in the long run.

Therefore, this study recommends that the governments in ECOWAS countries should holistically tackle corruption by focusing not only on the macro level, but also on the micro level. This can be done by re-orientating the citizens on societal value of hard work and integrity as against accumulating wealth by all means. Also, all anti-corruption efforts in ECOWAS countries should not just create anti-corruption agencies but ensure their effectiveness and high level of transparency in the discharge of their duties. Also, the judiciary system should genuinely promote equity and justice without partiality. In addition, any corrupt official should forfeit all material belongings and be sentenced to imprisonment.

Also, government expenditures should be increased in order to boost economic growth. Expansionary fiscal policy is recommended, especially in the time of recession, with a view to reviving the economy. The governments in ECOWAS countries ensure an increase in government



spending on capital projects and investments. Such funding should be channeled towards improving infrastructure, establishing firms to provide more employment opportunities, among other.

In addition, since increase in gross capital formation increases the level of economic growth, the governments in ECOWAS countries should encourage saving to promote accumulation of capital. They should also encourage investors to obtain loans at low interest rate to invest in their economies and consequently boost economic growth in the ECOWAS sub-region. However, ECOWAS countries openness to international trade should be engaged with caution.

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