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Institutional transformation as an effective tool for reducing corruption and enhancing economic growth: A panel study of West African countries

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Weak institutions and high levels of corruption are issues of great concern in West Africa because of their adverse effects on the economic growth of the region. While a significant portion of extant literature has focused on the determinants of corruption, empirical investigations of the effect of institutional quality on corruption are still limited, especially in Africa. This paper provides empirical evidence, which shows that improvement in the quality of governmental institutions is an effective means of controlling corruption in West Africa. Furthermore, the paper reveals that improvements in terms of the ability of governmental institutions to meet the economic needs of the people make the most impact on the ability to curb corruption in West Africa. Annual panel data series for14 ECOWAS countries on corruption control and governance quality, obtained from the Worldwide Governance Indicators and Ibrahim Index of African Governance online databases, for the period 2000–2015, were utilized in the study.

JEL CLASSIFICATION
C33; D73; O43

1 | INTRODUCTION

Africa as a continent has been faced with a variety of problems over the past centuries. Like every other continent, there are several issues uniquely associated with Africa due to the socio-political, economic, cultural, religious, and developmental states of the continent. Between the 19th and 20th centuries, Africa experienced the challenges of external infiltrations, foreign dominance, and subsequent conquest. The imperialist aggression, military invasions, distortion of peace and serenity, and eventual scramble for Africa by the colonial powers marked the beginning of the endless vulnerability and seeming misfortune of the continent. The era of colonialism imposed upon Africa new ways and processes of doing things. The original "Africanness" became slowly replaced by ways of the colonial masters. Western religions, western education, cultural dilution, slave trade, and new styles of governance are some of the by-products of colonization. Austin (2005) affirms that the imposition of colonialism on Africa altered its history forever (Settles, 1996). Heldring and Robinson (2012) similarly argue that colonialism negatively impacted the development of Africa.

Various leadership styles, or forms of government institutions, accompanied colonialism into Africa and thereafter continued to hold sway after the colonial era. The kinds of governance existing in various regions and countries of Africa can be traced back to what was practiced during the colonial era. However, the system of government most widely used in Africa currently is democracy, although this leadership style and the associated governmental institutions have been extensively abused by both government and non-government officials, thereby aggravating corruption at different levels and institutions of government. The issue of corruption in Africa is quite alarming as virtually every sector of the society is affected by it. As an example, in Nigeria, which is the largest and richest country in West Africa, the endless reports on cases of corruption across different sectors of the economy down to the various parastatals of government and public departments are, according to the in Nellis (1999), possible as a result of institutional deficiencies and non-transparent regulations.

What these corrupt practices do is to perpetually deny citizens of their rights and access to good things of life, impoverish the country,

cause unemployment, encourage theft and armed robbery, provoke aggression and indiscipline, increase hazard, and every other negativity that comes with it, and consequently leave Africa underdeveloped. Reactions to cases of corruption in Nigeria at different levels are not far-fetched. "While speaking in an annual lecture, a former president of Nigeria, Olusegun Obasanjo, expressed concern at the level of corruption going on among members of the House of Assembly and House of Representatives," similar to a description of the Nigerian National Assembly as nothing but a business enterprise with the primary objectives of the members being to make money in Uzochukwu (2019). Furthermore, there is ample evidence from existing literature that corruption is a major factor militating against economic growth and development in Africa (Bai & Wei, 2000; Gyimah-Brempong, 2002; Gerring & Thacker, 2004; Desta, 2006; Baliamoune-Lutz, Ndikumana, & UNECA, 2008; Jain, 2008; Asiedu & Freeman, 2009; Mcferson, 2009; Musila & Sigué, 2010; Justesen & Bjørnskov, 2014). It is thus without doubt that any action that curbs corruption will consequently lead to improved economic performance within the continent. This study, therefore, aims to investigate how the quality of governmental institutions influences corruption control and consequently economic growth in the West African sub-region. Improvement in institutional quality is explored in this study as a possible tool for curbing corruption and thus enhancing economic growth and development.

The uniqueness of this study lies in the following; first, instead of the corruption perception measures that are most commonly used in corruption-related studies, we employ corruption control estimates. Second, we use the Ibrahim Index of African Governance (IIAG) as the measure of governance quality. The IIAG provides a unique African perspective to the measurement of quality of governmental institutions, and the methodology applied in the construction of the index is very detailed, with four sub-categories provided and 100 indicators included in their generation. Third, our study provides more robust findings by disaggregating the IIAG index into four categories, each of which is independently included as a regressor in the analysis. Fourth, the often ignored problems of multicollinearity, cross-sectional dependence, and heteroscedasticity are adequately addressed by our study. The rest of this study is structured as follows; Section 2 provides an overview of the concepts of corruption, institutions, and institutional transformation, Section 3 explains the data used, the methodology adopted, and the results obtained, and Section 4 details the conclusions reached, as well as the recommendations made.

2 | CORRUPTION, INSTITUTIONS, AND INSTITUTIONAL TRANSFORMATION

2.1 | Corruption

A general look at the collective body of research related to corruption shows that while the subject has been vastly explored in the past, related studies are still on the rise. These include Asongu (2013, 2014), Efobi, Asongu, and Beecroft (2018); Efobi, Beecroft, and Asongu (2019), and Alola, Alola, Avci, and Ozturen (2019). According to Kigotho (2013), the increasing attention on the study of corruption suggests a probable increase in the level of corruption across institutions (Tanzi, 1998). This assertion is not far from that of Jiang (2017), which opines that the persistent negative impact of corruption in human history continues to attract the attention of scholars. Referring directly to the effects of corruption in higher educational institutions in Nigeria and Liberia, Kigotho (2013) affirms, "Corruption in higher education prevents those who would excel on merit from contributing to their nations' growth and development." The description of corruption as "The intentional non-compliance with the arm's-length principle aimed at deriving some advantage for oneself or for related individuals" according to Begovic (2005) is in accordance with the World Bank's view of corruption as the misuse of public office for private gain. Gous (2018), in his work on corruption and corrupt activities in South Africa, points out that bribery tops the list of corrupt activities among other diverse forms of illicit behavior, such as fraud, extortion, nepotism, graft, speed money, theft, embezzlement, falsification of records, influence peddling, and so forth (Balboa & Medalla, 2006). These definitions suggest that corrupt practices are deliberate choices made by perpetrators as a result of indiscipline and lack of principles.

Interestingly, corruption has become such a broad area of research that scholars are beginning to categorize and sub-categorize it in forms and levels. The typological distinction of corruption as "transactive versus extortive" by Alatas (2015) is similar to the "harassment bribe versus non-harassment bribe" of Fritzen and Basu (2011). Moody-Stuart (1997) identifies grand corruption—a form of corruption that takes place at the highest levels of political system and involves substantial payoffs—while Nilekani (2013) distinguishes between wholesale and retail corruption. According to Thompson (1993), individual corruption benefits officials personally, while institutional corruption benefits officials' interest group. Although each of these various views on corruption has their own shortcomings, Sumah and Mahic (2017) show that they all, however, agree that corruption economically jeopardizes the chances of growth and development of nations.

Many studies have also examined the causes of corruption and how to possibly reduce the adverse effects of the endemic problems brought about by corruption and corrupt practices upon a nation or institution. Such studies include Levin and Satarov (2000), Broadman and Recanatini (2001), Gyimah-Brempong (2002), Shabbir and Anwar (2007), Babalobi (2008), and Dimant and Tosato (2018). As a result, several factors have been identified as being responsible for corruption at different levels and institutions. According to Babalobi (2008), these factors include weak government institutions, poor pay incentives, lack of openness and transparency in public service, absence of key anti-corruption tools, ineffective political process, poverty, and resource scramble. Dimant and Tosato (2018) list some of the factors as follow: Bureaucracy and inefficient administrative and political structures, lack of press freedom, ethnic diversity, government size, and poor government structure. In general, many researchers have identified similar factors as determinants of

corruption. Possible solutions have also been proffered on how to solve the problem of corruption. For example, Lopez-Claros (2014), and Leary (2017) identify the following as means of dealing with corruption: Employment creation, increased wage for public workers, establishment of anti-corruption bodies, as well as promoting transparency, and openness in government.

2.2 | Institution

Institution as a concept is widely used by scholars from different fields and disciplines, such as philosophy, sociology, economics, and politics. Thus, its definition often depends on the particular field of interest or discourse. This explains why there is no single definition of the term Hodgson, 2006 as everyone's view of what institutions represent depends to a large extent on their field of specialty. Some popular definitions include that of Keizer (2008), who describes institutions as man-made rules that govern human behavior. Brunt (2007) also describes institutions as generally accepted procedures that govern the process of interaction between members of a society. Hodgson (2006) states that institutions constitute systems of established and prevalent social rules, which structure social interactions. This is affirmed by Dal Bó, Foster, and Putterman (2010), who in their experimental research on institutions and behavior, confirm that institutions have the capacity to either enable or constrain behavior. Their results show that "democratic institutions may affect behavior directly in addition to having effects through choice of policies." What this implies is that there is a close relationship between institutions and human behavior. However, for the purpose of this paper, we define institutions as the set rules and regulations formally recognized to execute a designated task so as to enforce law and order for the benefit of the citizenry and consequent growth of the society. Thus, our use of the term institutions encompasses all organized formal bodies, either public or private, such as educational institutions, financial institutions, governmental institutions, and indeed all institutions within the auspices of a society. The central focus of this study is, however, on governmental institutions.

Theoretically, the effects of institutions on economic performance (economic growth) can be viewed from the perspective of strong and weak institutions (Acemoglu, Johnson, Robinson, & Thaicharoen, 2003; Acemoglu, Johnson, & Robinson, 2005). Countries with strong institutions are those where a variety of checks and balances on the actions of politicians and other stakeholders in the institutions prevail, while countries with weak institutions are those characterized by dictatorships, and lack of constraints on the actions of politicians, and other stakeholders in the institutions. Corruption prevails in a country with weak institutions, paving a way for fluctuation in economic performance. In weak institutions, political office holders may pose as agents of economic instability while trying to influence the established norms to deviate from the principles or ethics of normalcy. When it is clear that much gains are attributed to political holders and stakeholders because of lack of constraints on their activities, there will be power tussle and infighting among the

various interested groups in a bid to cling to power. This will usher in political and economic instability, thereby affecting the economic performance of the country or region. Weak institutions pave way for lack of trust on the side of the entrepreneurs who may resort to withdrawal of their capital from certain sectors, thus contributing to economic turbulence. Volatility of policies prevailing in weak institutions through corrupt practices may cause economic instability as well. This can be seen where rules are bent to favor a certain class of people because of their affiliations to corrupt elements and their corrupt lifestyle and practices.

2.3 | Institutional transformation

According to the European Institute for Gender Equality on Institutional Transformation (2016), processes of change within institutions occur continuously because of the changing environment within the institution that gives room for new demands or incentives for change. These changes within the institutions also affect the outside environment.[1] Institutional transformation, for the purpose of this study, will refer to profound changes in the rules, regulations, beliefs, and value system that guide the total mode of operation of an institution to accommodate major aspects that produce workable results and bring about improved institutional quality and general productivity. Institutional transformation is thus an innovational necessity required for enhancement in institutional quality, which invariably shapes the economic outlook of the host society for the better. Ebben and Vaal (2009), in a study on institutions and the relation between corruption and economic growth, find that, in situations where institutions are not well developed, corruption may be conducive to growth.

3 | DATA, METHODOLOGY, AND RESULTS

Annual time-series data for 14 ECOWAS member countries (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo) on corruption control and governance quality were obtained from the Worldwide Governance Indicators (WGI) and Ibrahim Index of African Governance (IIAG) online databases for the period 2000–2015. Guinea-Bissau was dropped from the data set due to unavailability of data. In place of the Corruption Perception Index, which is mostly used in studies related to corruption, corruption control estimates are used as the dependent variable. This is because the main interest of the study is to see whether changes in the quality of African institutions result in more effective corruption control. Moreover, governmental institutional quality is measured with the aggregate African governance index reported in the Ibrahim Index of African Governance (IIAG) online databases, which is further split into its four main components—measuring the relative strengths of governance in enhancing human development, participation and human rights, sustainable economic opportunity, and safety and rule of law within each of the selected countries. Generally, governance refers to traditions

TABLE 1 Descriptive statistics of the variables for the countries analyzed

Country	Variable	Mean	Median	St. dev	Min	Max
Benin	HD	49.91	50.05	6.92	38.5	59.4
	PHR	145.47	145.25	3.11	141.2	150.8
	SEO	47.31	46.85	2.00	44.6	50.3
	SRL	127.24	127.2	3.49	122.3	133.7
	CC	−0.55	−0.59	0.25	−0.86	0.17
Burkina Faso	HD	44.7	44.3	2.18	41.1	47.8
	PHR	134.94	137.55	9.27	117.8	145.2
	SEO	47.03	46.85	1.96	44.5	49.9
	SRL	99.87	99.05	6.02	91.7	111.1
	CC	−0.31	−0.33	0.18	−0.52	0.14
Cape Verde	HD	72.07	72.35	1.13	70.5	74.2
	PHR	184.04	184.5	4.56	174.3	190.3
	SEO	58.56	59.55	2.27	52.9	60.4
	SRL	141.95	140.55	5.81	135.3	153.2
	CC	0.82	0.87	0.20	0.19	0.95
Cote d'Ivoire	HD	45.36	43.7	2.92	42.6	51.4
	PHR	84.24	83.1	16.43	56.2	107.2
	SEO	41.23	40.1	3.16	38	48.4
	SRL	81.98	75.7	15.51	65.7	107
	CC	−0.79	−0.92	0.41	−1.20	0.14
Gambia	HD	62.01	62.3	1.55	59.4	64.3
	PHR	50.49	48.5	4.70	46	59
	SEO	49.05	50	3.07	42.2	53.1
	SRL	97.78	100.35	9.77	81.6	111.6
	CC	−0.61	−0.69	0.26	−0.79	0.17
Ghana	HD	67.73	68.4	2.08	64.2	70.1
	PHR	160.14	162.05	4.20	151.4	163.9
	SEO	51.98	52.4	2.28	48.1	55.5
	SRL	138.6	145.5	26.63	63.2	150.7
	CC	−0.06	−0.05	0.10	−0.20	0.14
Guinea	HD	44.11	43.25	1.77	42.2	47.4
	PHR	78.82	77.2	7.32	66.4	91.3
	SEO	32.7	33.1	1.72	30	35.1
	SRL	81.36	83	10.67	59.4	95.5
	CC	−0.99	−1.07	0.37	−1.28	0.16
Liberia	HD	46.1	46.3	2.48	41.2	50.2
	PHR	116.85	115.7	8.95	107.3	141.5
	SEO	35.25	35.7	4.40	29	45
	SRL	101.51	102.9	9.10	83.9	117.5
	CC	−0.59	−0.66	0.25	−0.77	0.14
Mali	HD	50.07	50.1	0.62	48.8	50.9
	PHR	131.12	137.2	10.84	115.4	141.5
	SEO	45.99	46.15	1.16	44	47.4
	SRL	107.65	112	11.31	85.9	118.4
	CC	−0.58	−0.67	0.26	−0.83	0.15
Niger	HD	42.06	42.2	2.32	38.6	46.4

TABLE 1 (Continued)

Country	Variable	Mean	Median	St. dev	Min	Max
	PHR	114.45	113.7	12.74	90.7	129.7
	SEO	39.45	39.15	3.08	34.5	45.3
	SRL	105.44	106.45	6.88	94.2	115.8
	CC	−0.61	−0.64	0.25	−0.85	0.16
Nigeria	HD	47.07	46.4	1.59	45.7	50.7
	PHR	103.86	104	4.02	97	111.8
	SEO	36.18	35.5	1.81	34.4	39.5
	SRL	87.79	88.35	8.88	73.1	102.5
	CC	−0.99	−1.07	0.37	−1.27	0.14
Senegal	HD	51.64	51.15	2.80	48.6	56.6
	PHR	132.9	131.7	8.49	122.7	144.1
	SEO	50.43	50.65	1.65	48.2	53.4
	SRL	118.5	117.3	10.84	100.7	135.2
	CC	−0.27	−0.31	0.27	−0.64	0.14
Sierra Leone	HD	44.89	44.65	1.31	42.8	47.1
	PHR	112.82	116.55	7.89	98.5	120
	SEO	39.48	40.65	3.03	34.3	42.1
	SRL	105.78	101.2	8.92	95.2	118.5
	CC	−0.81	−0.91	0.31	−1.02	0.14
Togo	HD	46.09	45.1	3.97	41.9	52.9
	PHR	90.55	94	8.01	72.4	96.2
	SEO	29.03	28	3.97	24	35.7
	SRL	102.4	101.55	4.68	94.4	110.3
	CC	−0.85	−0.98	0.34	−1.04	0.16

Abbreviations: CC, Corruption Control; HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

and institutions by which authority in a nation is exercised for the common good, and covers the ability of governments to manage resources effectively and make good policies (Kaufmann, 2005). Quality of governance is, therefore, an adequate measure of the quality of governmental institutions. The data on these four measures of governmental institutions' quality were retrieved from IIAG for two reasons. First, the IIAG provides a unique African perspective to the measurement of quality of governmental institutions. Second, the methodology applied in the construction of the indexes is very detailed, with four sub-categories provided and 100 indicators included in their generation.

The descriptive statistics for the ECOWAS countries included in our analysis are presented in Table 1, where HD represents human development, PHR stands for participation and human rights, SEO is sustainable economic opportunity, SRL refers to safety and rule of law, and CC means corruption control. In Table 1, the lowest mean corruption control value [0.9979] reported for Nigeria shows that the country has the poorest control over corruption, and the highest mean corruption control value [0.82] reported for Cape Verde indicates that the country has the best control over corruption. Cape

Verde also turns out to be the best performing country in all the four sub-categories of institutional quality as can be inferred from the mean values. Niger has the least mean value for human development [42.06], Gambia has the least for participation and human rights [50.49], Togo has the least for sustainable economic opportunity [29], and Guinea has the least for safety and rule of law [81.36].

To test the impact of institutional quality on corruption control, the following econometric model is specified;

$$CC_{it} = \alpha + \beta_1 HD_{it} + \beta_2 PHR_{it} + \beta_3 SEO_{it} + \beta_4 SRL_{it} + \varepsilon_{it}, \quad (1)$$

ε_{it} = error term, t = 2000, 2001,..., 2015 and i = 1, 2,..., 14.

Based on the way the independent variables are defined and constructed, the likelihood that multicollinearity exists between them is very high. Not controlling for the possible effects of this problem may result in reduced stability of the estimates, magnified standard errors, and weakened ability to measure effects. We, therefore, test for the presence of multicollinearity in our data-series by obtaining the correlation matrix and the variance inflation factors (VIF). Table 2 presents the results of these tests. The correlation

TABLE 2 Multicollinearity analysis of uncentered regressors

Correlation matrix					
	HD	**PHR**	**SEO**	**SRL**	**VIF**
HD	1				13.065
PHR	0.877	1			18.662
SEO	0.704	0.538	1		20.761
SRL	0.509	0.697	0.959	1	14.825

Abbreviations: HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

TABLE 3 Multicollinearity analysis of regressors with centering

Correlation matrix					
	HD	**PHR**	**SEO**	**SRL**	**VIF**
HD	1				2.222
PHR	0.006	1			1.574
SEO	−0.013	0.177	1		1.924
SRL	0.021	0.458	0.118	1	1.364

Abbreviations: HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

matrix shows the existence of high correlations and the VIFs display very high values.

To deal with this issue of multicollinearity, we generate centered values for the regressors. These were obtained by subtracting each country-specific mean value from the actual value of each regressor, that is, we obtained $HD_{it} - mean[HD_i]$, $PHR_{it} - mean[PHR_i]$, $SEO_{it} - mean[SEO_i]$ and $SRL_{it} - mean[SRL_i]$. After centering the regressors, the correlation matrix and VIF are again obtained. The new results are displayed in Table 3. The new findings show that the correlation and VIF figures are now within acceptable limits. The centered values of the regressors are thus employed in our estimation of Equation (4).

Another possible problem that could arise in our panel data is cross-sectional dependence. Cross-sectional dependence refers to interaction among cross-sectional units (the individual countries in our case). Since the countries included in our analysis belong to a particular economic region, we suspect that they may be exposed to common shocks. We thus carry out the Pesaran (2004) CD test to check for the existence of cross-sectional dependence. The test statistic is developed by averaging pairwise correlation coefficients to test the null of no cross-sectional dependence. The test statistic is specified as follows:

$$CD_p = \sqrt{\frac{2}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} T_{ij} \hat{\rho}_{ij} \rightarrow N(0,1), \qquad (2)$$

where $\hat{\rho}_{ij}$ = Pairwise correlation coefficient.

TABLE 4 Cross-sectional dependence test results

	HD	**PHR**	**SEO**	**SRL**	**CC**
Statistic	11.02	1.540	8.340	0.060	1.250
p-value	.000	.123	.000	.956	.210

Abbreviations: CC, Corruption Control; HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

The test results as shown in Table 4 provide evidence in favor of the rejection of the null of no cross-sectional dependence in human development and sustainable economic opportunity, confirming the presence of cross-sectional dependence in the data series.

Next, we perform unit root tests to determine the order of integration of the variables. We tested all of the variables both with and without trend. The unit root tests applied are described as follows:

First, we perform the Im, Pesaran, and Shin (2003) unit root rest, which carries out the ADF unit root test below for each cross section.

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{it-j} + X'_{it}\delta + e_{it}, \qquad (3)$$

where Δy_{it} is the difference of y_{it} for ith country in time period $t = 1...T$.

And tests the null hypothesis;

$$H_0 : \alpha_i = 0 \text{ for all i}, \qquad (4)$$

against the alternative given as:

$$H_1 \begin{cases} \alpha_i = 0 \text{ for } i = 1, 2, ..., N_1 \\ \alpha_i < 0 \text{ for } i = N+1, N+2, ..., N \end{cases} \qquad (5)$$

And the test statistic obtained by averaging the α_i t-statistics from the individual ADF tests is given as follows:

$$\bar{t}_{NT} = \left[\sum_{i=1}^{N} t_{iT_i}(p_i) \right] / N. \qquad (6)$$

Next, we perform the Fisher–ADF and Fisher–PP unit root tests based on the works of Maddala and Wu (1999) and Choi (2001) in which p values from individual unit root tests are combined. According to these tests, given that π_i is the p value from individual unit root tests for each cross-section, for a null of unit-root for all cross-sections the asymptotic result is;

$$-2 \sum_{i=1}^{N} log(\pi_i) \rightarrow \chi^2_{2N}. \qquad (7)$$

Choi further shows that;

$$z = \frac{1}{\sqrt{N}} \sum_{i=1}^{N} \varphi^{-1}(\pi_i) \rightarrow N(0,1). \qquad (8)$$

Finally, we carry out the cross-sectional augmented Dickey–Fuller (CADF) unit root test, which provides valid results in the presence of cross-sectional dependence. This unit root test developed by Pesaran (2007) builds on the Dickey–Fuller/augmented Dickey–Fuller unit root tests and tests for a null of unit root. The test statistic is given as follows:

$$CADF_i = t_i(N,T) = \frac{\left(y_{i,-1}^T \bar{M} y_{i,-1}\right)^{-1} \left(y_{i,-1}^T \bar{M} \Delta y_i\right)}{\sqrt{\sigma_i^2 \left(y_{i,-1}^T \bar{M} y_{i,-1}\right)^{-1}}} \tag{9}$$

The unit-root test results overwhelmingly show the absence of unit roots in the data-series. Unit root test results are presented in Table 5.

There are three possible ways to estimate Equation (1). The first method is to simply combine the time-series data for each country across cross-sections and then carry out pooled ordinary least squares regression. This approach assumes common intercept such that:

$$\alpha_{it} = \alpha. \tag{10}$$

The assumption of common intercepts and slopes in this approach is, however, a major weakness since this is often not the case in reality.

The second option is to carry out a fixed-effects panel regression, which allows for different intercepts across cross-sections such that:

$$\alpha_{it} = \alpha_i \text{ where } E[\alpha_i \varepsilon_{it}] \neq 0. \tag{11}$$

And the third approach is the random-effects model, which treats the intercepts as random variables across cross-sections such that:

$$\alpha_{it} = \alpha + u_i \text{ where } E[u_i \varepsilon_{it}] = 0. \tag{12}$$

To choose the most suitable between the fixed-effects model and random-effects model, we perform the Hausman test. The Hausman test result, as seen in Table 6, shows that the statistic, chi2 (1) = 24.416, p = .0001. This indicates that the fixed-effects model is the most appropriate for estimating Equation (1).

H_0: Difference in coefficients is not systematic.

$$Chi2(1) = (b-B)' \left[(V_b - V_B)^{-1} \right] (b-B) = 24.416; Prob > Chi2(1) = 0.001.$$

We estimated Equation (1) using the fixed-effects panel estimation and carried out diagnostic tests for heteroscedasticity and serial-correlation. The panel cross-section heteroscedasticity likelihood ratio test statistic of 98.302 with a p value of .000 led to the rejection of the null of homoscedasticity, and a Durbin–Watson statistic of 0.981 confirmed the presence of autocorrelation. To deal with the three problems identified (cross-sectional dependence, heteroscedasticity, and autocorrelation), we estimated Equation (1) via fixed-effects estimator with Driscoll–Kraay standard errors.

On the basis of the panel regression outcomes reported in Table 7, we infer the following: The estimated fixed-effects model is significant (F[4,9] = 1,732.25, Prob> F = 0.000). Approximately, 81.4% of the variation in corruption control is explained by the model (R^2 = 0.814). All the regressors display positive and significant coefficients. Specifically, we find that a percentage point increase in human development performance results in 0.021% point increase in corruption control. This is an indication that improvement in people's freedoms, opportunities, and well-being makes it easier for West African countries to control corruption. Moreover, a percentage point increase in participation and human rights performance lead to

TABLE 5 Panel unit root tests

		Im Pesaran and Shin		ADF–Fisher chi-square		PP–Fisher chi-square		CADF	
		No trend	Trend	No trend	Trend	No trend	Trend	No trend	Trend
LEVEL	HD	1.946*	1.228*	25.309**	13.378*	32.246*	24.935**	−2.350*	−2.780**
		[0.074]	[0.050]	[0.011]	[0.061]	[0.065]	[0.031]	[0.919]	[0.961]
	PHR	−2.131**	−1.455*	55.026***	54.421***	69.472***	44.251**	−1.896**	−3.994***
		[0.017]	[0.073]	[0.002]	[0.002]	[0.000]	[0.026]	[0.021]	[0.000]
	SEO	−5.735***	−1.686**	87.538***	56.285***	81.634***	71.059***	−0.783	−2.310**
		[0.000]	[0.046]	[0.000]	[0.001]	[0.000]	[0.000]	[0.994]	[0.043]
	SRL	−4.977***	−2.363***	38.018*	42.707**	60.892***	37.693***	2.320*	−3.146**
		[0.0000]	[0.009]	[0.098]	[0.037]	[0.000]	[0.004]	[0.090]	[0.017]
	CC	−1.978**	−1.915**	47.271***	31.287***	5.537*	15.727**	−2.200*	−2.928*
		[0.024]	[0.027]	[0.001]	[0.005]	[0.099]	[0.030]	[0.051]	[0.054]

Note: *, **, and *** mean statistic relationship significant at 10, 5, and 1%, respectively. Im, Pesaran and Shin W-stat, and ADF–Fisher Chi-square presuppose individual unit root process. Δ denotes the first difference.
Abbreviations: CC, Corruption Control; HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

TABLE 6 Hausman test

Coefficients				
(b)	(B)	(b-B)	Sqrt(diag [V_b – V_B])	
Fixed	Random	Difference	S.E	
HD	0.011	−0.004	0.000	0.001
PHR	0.004	0.005	0.000	0.649
SEO	0.002	0.009	0.000	0.028
SRL	0.003	0.004	0.000	0.183

Abbreviations: HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

TABLE 7 Panel results

Variables	Coefficients	Drisc–Kraay Std. Errors	p values
HD	0.0210***	0.0020	.000
PHR	0.006***	0.0004	.000
SEO	0.013***	0.0035	.005
SRL	0.0007*	0.0013	.088
R2	0.814		
Fstat	1,732.25***		
p-value	0.000		

Note: *, **, and *** mean statistic relationship significant at 10, 5, and 1%, respectively.
Abbreviations: HD, Human Development; PHR, Participation and Human Rights; SEO, Sustainable Economic Opportunity; SRL, Safety and Rule of Law.

0.006% point increase in corruption control. This suggests that factors, such as political and public participation rights, rights to peaceful association, rights to peaceful assembly, freedom of expression, freedom of opinion, and rights to information ensure the presence of a vibrant civil society that is capable of challenging corruption. Furthermore, a percentage point rise in sustainable economic opportunity performance causes corruption control to rise by 0.013 percentage point. This shows that countries with better public management, business environments, infrastructure, and rural sectors perform better in terms of corruption control. Finally, if safety and rule of law rises by 1 percentage point, control of corruption will rise by 0.0007 percentage point. This confirms that countries with transparency and accountability, effective legal framework and judicial system, personal safety, and national security are better able to deal with corruption. While the coefficients on HD, PHR, and SEO are significant at 1 percent significance level, the coefficient on SRL is significant at 10% significance level.

4 | CONCLUSION

This study proposed and estimated a panel fixed-effects econometric model for 14 ECOWAS countries over the period 2000–2015, which tested the effect of the quality of governmental institutions on corruption control for the region. The contribution of this study is threefold. First, it investigates the interaction between quality of governmental institutions and corruption control by disaggregating the institutional quality variable into human development, participation and human rights, sustainable economic opportunity, and safety and rule of law. Second, it takes the often ignored problems of multicollinearity, cross-sectional dependence, and heteroscedasticity into consideration. Third, instead of the commonly used Corruption Perception Indices, this study employs corruption control estimates as the dependent variable.

The main findings along with our recommendations are subsequently discussed. To begin with, the results indicate that all the four components of governmental institutions' quality accounted for, in this study, positively impact corruption control. We thus come to the conclusion that countries with well-developed institutions are better able to deal with the problem of corruption, and we, therefore, advise West African countries to focus more attention on building robust institutions. Building strong institutions is crucial to corruption control and should, therefore, form a major part of anti-corruption strategies both at regional and country levels. Efficient public management systems, an effective legal framework, an independent judiciary, and a vibrant civil society are required by West African countries to protect against corruption. Institutional strengthening is thus expected to form a key part of the anti-corruption strategies in each of the countries of the region.

Furthermore, the fact that the coefficients on human development and sustainable economic opportunity are the highest of the four components, reveal that improvements in quality of governmental institutions in terms of the ability to meet the economic needs of the populace exerts the biggest influence on corruption control. This finding is surprising and interesting, as one would have expected that the components related to participation and human rights, as well as safety and rule of law, would have the biggest effects on corruption because of their roles of restricting arbitrary exercise of power and setting standards for human behavior. This finding mainly suggests that poverty and lack of economic opportunities are the factors sustaining corrupt practices in West Africa. A key implication of this finding is that no matter how stringent the laws imposed to prevent corruption are, people will still find ways to engage in corrupt practices unless and until their economic situation is improved. The links between corruption and poverty and lack of economic opportunities are strong and pervasive. Poor people often find earning an honest living difficult and are, therefore, more likely to engage in corrupt practices, such as bribery, extortion, and theft for survival.

CONFLICT OF INTEREST
The authors declare no conflicts of interest.

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ENDNOTE

[1] European Institute for Gender Equality, *Institutional Transformation*: Gender Mainstream Toolkit. (Luxembourg: Publications Office of the European Union, 2016).

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