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INSTITUTIONAL QUALITY AND SUSTAINABLE DEVELOPMENT: A QUANTITATIVE ANALYSIS

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Abstract

The aim of this study is to investigate the impact of institutional quality on sustainable development. The presence of corruption, weak rule of law and the inadequacy of regulatory frameworks instigate this study. The study specified a model where gross domestic product per capita was the dependent variable and institutional quality (voice and accountability, rule of law, control of corruption and regulatory quality) were the independent variables. Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) and co-integrating regression (CRR) were applied to the annual time-series data gathered on the variables from 1996-2024; the results revealed that institutional quality and sustainable economic development had a positive relationship. Specifically, amongst other things control of corruption, regulatory quality where found to have a positive and significant impact during the period under review. The study therefore recommends the strengthening of institutions to foster economic growth and development now and in the future.

Keywords:
institutional quality, gross domestic product per capita, voice and accountability, rule of law, control of corruption and regulatory quality

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Introduction

Institutional quality refers to the effectiveness, efficiency and reliability of a nation's institutions. These institutions may be its government, legal system, public services and regulatory framework. Institutional quality is a cornerstone of sustainable development; strong institutions are fundamental to achieving sustainable development, as they lay the ground work for economic prosperity, social advancement and environmental stewardship. The outcome of institutional quality on sustainable development underscores the need for a robust institutional framework (Aberu and Abayomi, 2025).

The concept of sustainable development has emerged as a paramount objective for human civilization, gaining significant traction in recent years. At its core, sustainable development seeks to balance economic, social and environmental considerations to meet the needs of the present generation without compromising the well-being of future generations. The positive impact of institutional quality on sustainable development reflects on effective governance, reduced corruption, social sustainability which includes peace, justice and strong institutions.

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Institutional quality fosters an environment conducive for sustainable innovation and economic activities leading to economic growth and development. Despite the positive impacts and opinion expectations of institutional quality on sustainable development, the evidence in developing countries are divergent from these expectation because several problems hinder this positive impact of institutional quality on sustainable development. (Hussen, 2023).

The problems of poor governance where weak institutions have lead to ineffective governance, corruption, non implementation of sustainable development goals, lack of transparency and accountability and the frail rule of law persists in developing countries. Added to these are the inadequacy of regulating framework, insufficient public participation where public needs and concerns are not addressed leading to unsustainable outcomes, limited capacity and resources (Liko, 2024). It is on this premise that this study seeks to investigate the relationship between institutional quality and sustainable development using quantitative analysis and also exploring the impact of institutional factors on sustainable development using gross domestic product per capita as an economic indicator.

The study is organised into five sections. The preceding section was the introduction and sequel to this is the literature and empirical review. Methods and model specification will make up section three and section four will be the data analysis, results and discussion of findings. Section five is the conclusion and recommendations.

Literature Review

Components of institutional quality

Institutional quality comprises of six key components that collectively provide a comprehensive assessment of a country's institutional framework. These components are

Voice and accountability: This dimension assesses the extent to which citizens can participate in the selection of their government and enjoy fundamental freedoms such as freedom of expression; association and a free media.

Political stability and absence of violence: This component evaluates the likelihood of political instability, violence and terrorism providing insight into the security and stability of a country political environment.

Government effectiveness: This aspect reflects the quality of public services, the independence of the civil service and the commitment of the government to the implementation of its policies.

Regulatory quality: Measures the government ability to design and implement foolproof policies and regulations that support private sector and promote ease of doing business.

Rule of Law: This aspect assesses the confidence of citizens in the law and the rules of the society. This component also highlights the strength of a country's legal framework.

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*Control of Corruption***:** Reflects the extent to which private gain is achieved through the use of public power. It also includes forms of corruptions and provides deeper understanding on the integrity of governance.

Empirical Review

Liko (2024) explored the role of institutions in fostering economic growth and development in Balkan region over the period 2000-2022, the analysis based on co-integration and long-run estimation techniques confirmed a positive and significant relationship between institutional quality and economic growth. Additionally, the study finds that education supports growth, while unemployment hinders it. The results underscore the need for policy makers to prioritize institutional reforms and education to achieve sustainable economic growth and job creation.

Hussen (2023) employed a panel data approach to examine the impact of different dimensions of institutional quality indices on economic growth of sub-Saharan African countries. The empirical results from the study revealed that democratic and regulatory institution have a positive and significant impact on economic growth. Investment – promoting institution where also found to have positive and significant impact on economic growth, more also institution that were involved in conflict – prevention had no significant impact on economic growth. The study was concluded by recommending institutional reforms in the conflict preventing institutions.

Azam, Hunjia, Bouri, Tan & Al-Faryan (2021) in their study aimed at determining the impact of institutional quality on sustainable development analysed a panel data from 66 developing countries for a period of 25years using the system generalised method of moments, the study revealed that strong institutional quality significantly contributes to sustainable development. The positive impact from their finding was more pronounced in lower-middle income countries. They therefore recommended that policy makers should consider diverse institutional forms when designing sustainable development policies.

Hari-Hassoun, Clubi & Che Kouri (2024) analysed the impact of institutional quality on sustainable development in 11 MENA countries. The study highlighted institutional environment indicators as hindrances to sustainable development, therefore with the use of fully modified ordinary heart square methods; they found out that there is a positive and significant relationship between institutional quality and sustainable development in the countries under study. However with further adjustments in estimation techniques employed; the relationship becomes negative which they concluded was an indication of weak political framework in MENA nations.

Alonso, Carlos & Virmantas (2020) study, aimed at identifying the key factors that influence institutional quality. Their findings indicate that institutional quality is shaped by variables that can be influenced by public policy including income per capita international trade education, taxation and income distribution. These were determined using the generalised method of

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moments (GMM) technique. The conclusions from the study suggested that institutional quality can be improved through targeted policy interventions.

Methodology and Model Specification

This study analyzed institutional quality and sustainable development in Nigeria covering the period from 1996 to 2024, chosen as a result of data availability. This study is based on time series research design in line with the *ex-post facto* approach, which entails the establishment of a causal relationship between variables of interest using historical secondary data obtained from the World Bank datasheet for various years. In analyzing the data, a battery of econometric tests, tools and techniques such as the descriptive statistics, variance inflation factors (VIF) test of multicollinearity, Granger causality test, fully modified ordinary least squares(FMOLS), dynamic ordinary least squares (DOLS) and canonical co-integrating regression (CRR) were applied to the annual time-series data.

Therefore, this study specifies the relationship between institutional quality and sustainable development in Nigeria by expressing the equation in a functional form; thus:

$$GDPPC = F(RUL, RGQ, VOA, POS, COC) \quad 1$$

$$\log GDPPC = \alpha_0 + \alpha_1 RUL + \alpha_2 RGQ + \alpha_3 VOA + \alpha_4 POS + \alpha_5 COC + \mu \quad 2$$

Where:

α_0 = Regression constant

$\alpha_1 - \alpha_5$ = Regression parameters

μ = Stochastic error terms

Theoretically, it is expected that each measure of institutional quality in the model should have a positive and significant impact on sustainable developmentin Nigeria. Hence, the following mathematical notations are expected to stand: $\alpha_1 - \alpha_5 > 0$, ceteris paribus.

Results and Discussion of Finding

Descriptive statistics analysis

Table 1: Result of descriptive statistics

	GDPPC	RUL	RGQ	VOA	POS	COC
Mean	1740.338	-1.092414	-0.918276	-0.681379	-1.730345	-1.164138
Median	1822.500	-1.070000	-0.920000	-0.660000	-1.870000	-1.120000
Maximum	3088.700	-0.840000	-0.680000	-0.310000	-0.580000	-0.900000
Minimum	490.7000	-1.510000	-1.290000	-1.550000	-2.210000	-1.500000
Std. Dev.	719.0391	0.183841	0.151022	0.254877	0.399745	0.135923
Skewness	-0.264120	-0.750260	-0.687498	-1.424164	1.328551	-0.787781
Kurtosis	2.229961	2.880350	3.230555	6.054223	3.963232	3.165429
Jarque-Bera	1.053665	2.737931	2.348722	21.07485	9.652173	3.032627
Probability	0.590472	0.254370	0.309016	0.000027	0.008018	0.219520
Sum	50469.80	-31.68000	-26.63000	-19.76000	-50.18000	-33.76000
Sum Sq. Dev.	14476484	0.946331	0.638614	1.818945	4.474297	0.517303
Observations	29	29	29	29	29	29

Source: Researcher's presentation from E-views 10.0 statistical software

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The study began this section by comprehensively comparing the descriptive statistics of the dataset employed in this study. Table 1 shows the result of the descriptive or summary statistics for both dependent, independent and control variables. From the result, it could be observed that the mean values were: 1740.33 for sustainable development (GDPPC); -1.09 for rule of law (RUL); -0.91 for regulatory quality (RGQ); -0.68 for voice and accountability (VOA); -1.73 for political stability (POS); and -1.16 for control of corruption (COC). The median values of the variables were: 1822.50 for sustainable development (GDPPC); -1.07 for rule of law (RUL); -0.92 for regulatory quality (RGQ); -0.66 for voice and accountability (VOA); -1.87 for political stability (POS); and -1.12 for control of corruption (COC).

The maximum values were: 3088.70 for sustainable development (GDPPC); -0.84 for rule of law (RUL); -0.68 for regulatory quality (RGQ); -0.31 for voice and accountability (VOA); -0.58 for political stability (POS); and -0.90 for control of corruption (COC). The minimum values were: 490.70 for sustainable development (GDPPC); -1.51 for rule of law (RUL); -1.29 for regulatory quality (RGQ); -1.55 for voice and accountability (VOA); -2.21 for political stability (POS); and -1.50 for control of corruption (COC).

From the summary output, the standard deviation values were: 719.03 for sustainable development (GDPPC); 0.18 for rule of law (RUL); 0.15 for regulatory quality (RGQ); 0.25 for voice and accountability (VOA); 0.39 for political stability (POS); and 0.13 for control of corruption (COC). From the E-view result, the skewness values of -0.26 for sustainable development (GDPPC); -0.75 for rule of law (RUL); -0.68 for regulatory quality (RGQ); -1.42 for voice and accountability (VOA); and -0.78 for control of corruption (COC) respectively, mirrored a negatively skewed distribution, implying that the distribution had a long-left tail with lower values than the sampled mean.

On the other hand, the skewness value of 1.32 for political stability (POS) mirrored a positively skewed distribution, indicating that the distribution for this variable has a long right tail with higher value than the sampled mean. The results obtained in table 1 for the dataset show that the kurtosis values of 2.22 for sustainable development (GDPPC); and 2.88 for rule of law (RUL) were less than 3.0000 required for a normal distribution. Hence, the data for these variables had a flattened curve and produced lower values than the sample mean.

On the other hand, the coefficients of kurtosis of 3.23 for regulatory quality (RGQ); 6.05 for voice and accountability (VOA); 3.96 for political stability (POS); and 3.16 for control of corruption (COC) respectively were greater than the 3.0000 required for normality. This indicated that the dataset was leptokurtic, meaning it produced higher values than normal. Given the results above, the JB values of 1.05 for sustainable development (GDPPC); 2.73 for rule of law (RUL); 2.34 for regulatory quality (RGQ); and 3.03 for control of corruption (COC) with their respective p-values of 0.59, 0.25, 0.30, and 0.21, which are all greater than 0.05, suggested that the null hypotheses for all the variables were not rejected. This therefore indicated that the dataset was normally distributed.

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Table 2: Unit root tests and order of integration: Group unit root test (levels)

Group unit root test: Summary

Series: GDPPC, RUL, RGQ, VOA, POS, COC
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.41827	0.0078	6	167
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.23349	0.0128	6	167
ADF - Fisher Chi-square	25.0903	0.0144	6	167
PP - Fisher Chi-square	24.3602	0.0182	6	168

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Source: Researcher's computation from E-views 10.0 statistical software

Group unit root test: Summary

From Table 2, the measurement of the group unit root in the data revealed that the series were stationary at levels in the 1%, 5%, and 10% significance levels. By implications, the variables (GDPPC, RUL, RGQ, VOA, POS and COC) were found to have no unit root at the 1%, 5%, and 1% levels of significance, as shown in Table 3. Hence, the null hypothesis was rejected. Since the study has confirmed the stationarity of the variables, it means that the variables chosen for this study are suitable for further analysis.

Test of Multicollinearity

Table 3: Variance inflation factor (VIF)

Variance Inflation Factors

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
RUL	0.065256	66.85714	1.793639
RGQ	0.069453	50.71203	1.336079
VOA	0.045294	17.62380	1.419559
POS	0.015974	43.52730	1.927784
COC	0.101596	118.0764	1.587587
C	0.343954	290.9293	NA

Source: Researcher's computation from E-views 10.0 statistical software

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To avoid running regression which is marred by the problem of multicollinearity, this study conducts the variance inflation factors (VIF) test on the explanatory variables. VIFindicates how the variance and covariance of an estimator increase by the presence of multicollinearity, and if the VIF of a variable exceeds 10, that variable is said to be highly collinear (Gujarati, 2017). The results of the multicollinearity test as presented in Table 3 are 1.79, 1.33, 1.41, 1.92 and 1.58 as the VIFs for RUL, RGQ, VOA, POS and COC respectively. Hence, this suggested that the variables are not subject to multicollinearity problems since none of the VIFs exceeds the threshold of 10.

Johansen cointegration test

There is a need to test for any evidence of long-run co-movement among the variables of study since they were stationary at level, therefore, since all the variables are integrated into order zero (0), the Johansen co-integration test was conducted and the results are reported in Tables 4 and 5. The test's results as indicated by the Trace test indicated five (5) cointegrating equations while the Maximum Eigenvalue statistics indicatedonly one cointegrating equation at the 0.05 level. This suggested that the variables are cointegrated, which means that there is a long-run relationship between institutional quality and sustainable development in Nigeria during the study period under study.

Table 4: Johansen cointegration test: Trace test

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.770285	126.9953	95.75366	0.0001
At most 1 *	0.712028	87.28057	69.81889	0.0011
At most 2 *	0.559261	53.66844	47.85613	0.0129
At most 3 *	0.508118	31.54727	29.79707	0.0311
At most 4	0.240608	12.39036	15.49471	0.1392
At most 5 *	0.167785	4.958953	3.841466	0.0259

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's computation from E-views 10.0 statistical software

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Table 5: Johansen cointegration test: Maximum Eigenvalue

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.770285	39.71472	40.07757	0.0549
At most 1	0.712028	33.61213	33.87687	0.0537
At most 2	0.559261	22.12116	27.58434	0.2142
At most 3	0.508118	19.15692	21.13162	0.0924
At most 4	0.240608	7.431402	14.26460	0.4394
At most 5 *	0.167785	4.958953	3.841466	0.0259

Max-eigenvalue test indicates 1 cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's computation from E-views 10.0 statistical software

Cointegrating regression models estimation

The co-integrating (long-run) effect of institutional quality on sustainable development in Nigeria was empirically established using the Fully modified least Squares (FMOLS), dynamic least squares (DOLS) and canonical cointegrating regression (CCR) techniques. The results of the three models as shown in Table 6 reveal that rule of law (RUL) has a positive impact on the sustainable development (GDPPC) in Nigeria and the relationship was found to be significant at five per cent level. By this result, the null hypothesis that rule of law does not exert a significant influence on sustainable development in Nigeria is rejected, thus, the finding is in line with the a priori expectation of the study.

Table 6: Fully Modified Least Squares (FMOLS), Dynamic Least Squares (DOLS) and Canonical Co-integrating Regression (CCR) Estimates

METHODS/ VARIABLES	**FMOLS**		**DOLS**		**CCR**	
	COEF.	**PROB.**	**COEF.**	**PROB.**	**COEF.**	**PROB.**
RUL	1.138720	0.0003*	0.402619	0.0047*	1.225748	0.0037*
RGQ	1.850130	0.0000*	2.390587	0.0140*	1.875732	0.0000*
VOA	-0.53386	0.0200*	-1.47132	0.0287*	-0.56765	0.0027*
POS	-0.23477	0.0767	-0.09865	0.8677	-0.21975	0.2280
COC	0.627086	0.0619	1.261051	0.1310	0.572518	0.1113

Source: Researcher's computation from E-views 10.0 statistical software
Note: * implies a statistically significant 5%; COEF. = Coefficients; and PROB. = Probability

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Similarly, the results of the three models as shown in Table 6 reveal that regulatory quality (RGQ) has a positive impact on the sustainable development (GDPPC) in Nigeria and the relationship was found to be significant at five per cent level. By this result, the null hypothesis that regulatory quality does not exert a significant influence on sustainable development in Nigeria is rejected, thus, the finding is in line with the a priori expectation of the study.

On the other hand, the results of the three models as shown in Table 6 reveal that voice and accountability (VOA) has a negative impact on the sustainable development (GDPPC) in Nigeria and the relationship was found to be significant at five per cent level. By this result, the null hypothesis that voice and accountability not exert a significant influence on sustainable development in Nigeria is rejected, thus, the finding is in line partially with the a priori expectation of the study.

Furthermore, the results of the three models as shown in Table 6 reveal that political stability (PLS) has a negative impact on the sustainable development (GDPPC) in Nigeria and the relationship was found to be non-significant at five per cent level. By this result, the null hypothesis that political stability does not exert a significant influence on sustainable development in Nigeria is accepted, thus, the finding is not line with the a priori expectation of the study.

Lastly, the results of the three models as shown in Table 6 reveal that control of corruption (COC) has a positive impact on the sustainable development (GDPPC) in Nigeria and the relationship was found to be non-significant at five per cent level. By this result, the null hypothesis that control of control does not exert a significant influence on sustainable development in Nigeria is accepted, thus, the finding is in line partially with the a priori expectation of the study.

Conclusion and Recommendations

The aim of this study was to investigate the impact of institutional quality on sustainable development and the role it plays in creating sustatianle development. Based on apriori expectations, the variables specified as indicatiors of institutional quality were seen to have a relationship with sustainable development and the impact in varying magnitudes,

Therefore, the findings from this study inform the following recommendations.

1. The creation of a secure and predictable legal frame works that support business investments, innovation and ease of doing business.
2. The introduction of open data policies to minimize corruption and bureaucratic inefficiencies thereby promoting transparency and accountability in institutions.
3. Strengthening institutions by ensuring that institutions are independent and free from political interference so that decisions are made free of political considerations.
4. Promotion of trade agreements through favourable negotiation will help increase market access and promote economic cooperation. Also the speacialised procedures in customs and tariffs reduction should go along way in stabilizing trade investments.

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