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Full Length Research Article

AN EVALUATION OF THE IMPACT OF QUALITY OF LIFE ON GOVERNMENT EFFECTIVENESS USING MULTICOLLINEARITY TECHNIQUE: EVIDENCE FROM NIGERIA

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ABSTRACT
Studies have shown that researchers often face challenges in identifying and addressing multicollinearity effectively, which potentially lead to incorrect inferences. This study aims to detect the presence and impact of multicollinearity within a multiple linear regression model. It also intends to examine the effect of quality of life indicators on Government effectiveness in Nigeria. The data utilized in this study was the Government effectiveness and the quality of life (proxies by suicide mortality rate, self-employment, control of corruption, rule of law, government expenditure, military expenditure, life expectancy at birth, security of life and property, infant mortality rate, people using at least basic sanitation service, people using safety managed drinking water services, people using safely managed sanitation services and vulnerable employment between 2001 – 2021). The data was extracted from the World Development Indicators (WDI) database. The variance inflation factors (VIF), correlation matrices, and condition indices were employed to detect and address multicollinearity within the multiple linear regression model using stepwise method. Findings indicated that, most of the predictor variables were highly correlated with each other, except; suicide mortality, control of corruption, rule of law, general government final consumption expenditure, military expenditure and number of infant deaths, which were retained for the study. It was also revealed from the result that suicide mortality rate has a negative and insignificant influence while military expenditure and control of corruption was found to be positively and significantly related to government effectiveness at 5% significance level.

Keywords: Multicollinearity, Multiple Linear Regression (MLR), Variance Inflation Factor (VIF), correlation matrices, Life expectancy at birth (X_7)

INTRODUCTION

Nigeria, as a diverse and populous nation in West Africa, grapples with numerous challenges related to government effectiveness and citizens' quality of life. Historically, the country has faced issues such as corruption, political instability, inadequate infrastructure, and unequal access to essential services, Adedeji and Otite, (1997). These challenges have significant implications for the well-being of its citizens. In recent years, the question of how government effectiveness influences the quality of life has gained significant attention in academic, policy, and development circles. Studies have proven that quality of life and happiness are strongly associated with the quality of the government (Helliwell & Huang, (2008); Ott, (2011); Ibrahim (2013);Samanni & Holmberg, (2010); Tavits, (2007)). Studies regarding the relationship between the effect and quality of the government and quality of life (Bjørnskov *et al*., (2007); Hessami, (2010); Ott, (2005); Scully (2001); Shin & Johnson, (1978)) have also been conducted. In summary, it can be stated that by conceptualizing the characteristics of a government based on its quality and size, multiple research attempts have been made to analyze how these characteristics affect quality of life. These studies have drawn some contentious conclusions; however, most of them report that while the quality of the government has a positive effect on the quality of life, an increase in the government's size tends to have a negative impact on the quality of life (Lee, 2021).

The effectiveness of government institutions in Nigeria has been a subject of ongoing concern, impacting various facets of public well-being, from access to basic services to socio-economic development. This research embarks on a comprehensive investigation into the relationship, and the presence of multicollinearity within the multiple linear regression model examining the link between government effectiveness and quality of life in Nigeria. According to the World Bank (2021), Nigeria's journey since gaining independence in 1960 has been marked by periods of political instability, economic fluctuations, and social disparities. Such disparities have raised questions about the effectiveness of government policies in redistributing wealth and improving citizens' lives. Furthermore, Transparency International's Corruption Perceptions Index currently ranks Nigeria at 145 out of 180 countries, (Transparency International, 2023). This issue directly impacts government effectiveness and erodes public trust in institutions.

In the realm of statistical modeling, multiple linear regression serves as a fundamental tool for understanding relationships between multiple independent variables and a dependent variable. However, the presence of multicollinearity, a statistical phenomenon characterized by high correlations between predictor variables, can complicate the interpretation and reliability of regression results. This study examines multicollinearity within multiple linear regression models. Multiple linear regression, is a widely used statistical technique for modeling the relationship between a dependent variable and multiple independent variables (Farrar and Glauber, 1967). It has a broad range of applications, from economics and finance to social sciences and healthcare research. Multiple linear regression provides valuable insights into how changes in independent variables impact the dependent variable and allows researchers to make predictions and understand causal relationships. However, the effectiveness of multiple linear regression hinges on the assumption that the predictor variables are not highly correlated with each other. When

this assumption is violated, multicollinearity occurs. Multicollinearity can introduce several challenges and distort the results of a regression analysis.

This study aims to detect the presence and impact of multicollinearity within a multiple linear regression model, it also intends to examine the influence of quality of life of Nigerians on Government effectiveness.

Government Effectiveness and Quality of Life: The Nexus

Effective governance is about the interaction between governments and other social organizations, the relationship with citizens, decision making, and accountability. Governments have a key role in this network, since good governance implies managing public affairs in a transparent, accountable, participatory and equitable manner, Santiso, (2001). Determining the quality of governance requires measuring two achievements, improvements in public policy outcomes, and improvements in respect of principles of governance. The two aspects are strongly related, being sides of the same coin. As noted by Bovaird and Loffler (2007), the quality of good governance can be inferred from the achievement of key quality of life domains and by how far each of the key governance principles has been achieved. Effective governance should be accompanied by the achievement of high levels of social, economic and environmental welfare, through the cooperation and interaction of multiple stakeholders like; local authorities, business, voluntary sector and media.

Verifying the existence of good local governance requires assessing the impacts or outcomes of public policies, that is, the effect of public policies on the quality of life of the citizens (something that goes beyond the mere outputs or services provided). For instance, better governance should improve physical safety, for which it is necessary to reduce crime (outcome), but this cannot be assured by increasing the number of police hours (output). Citizens and other stakeholders are interested in measuring the success of public interventions in terms of the changes they bring in the quality of life, rather than by the quality of the activities themselves. But, as Rotberg (2014) indicates, governance is tangible, and measuring performance can best be done by using publicly available objective data.

In turn, measuring the quality of life of the citizens is far from being an easy task. Using aggregated macroeconomic variables would oversimplify the problem. The flaws of conventional measures, such as the Gross Domestic Product (GDP), are well known to economists and social scientists (Stiglitz *et al*., 2010). The reason is that human, and not economic, development should be the ultimate goal of society. Furthermore, human development has a positive impact on economic growth, while the opposite is not necessarily true (Ranis and Stewart, 2000). Multidimensional measures of quality of life, which go beyond the simplistic macroeconomic figures, may offer better guidance to policy making. The reason is these measures will be able to summarize information about the many different dimensions of life that contribute to human development, welfare and, at the same time, sustainable growth

Empirical Review

Various studies have discussed the relationship between quality of life and governance (Helliwell & Huang, (2008); Ott, (2011); Samanni & Holmberg, (2010); Tavits, (2007)). Furthermore, indexes such as the World Competitive Index compiled by international and research organizations are used to compared the performance of the governments of various countries and are important standards for conducting research. Helliwell and Huang (2008) discussed the close relationship between life satisfaction and the quality of governments rather than considering economic factors such as disposable income by using data from the World Values Survey. The primary factors that determine the quality of a government are the ability to provide a safe environment and efficient services for citizens. Research conducted by Kaufman *et al.* (2003) identified six aspects of the quality of government that influence the subjective well-being of citizens in different nations. The study proved that the quality of government affects quality of life, as differences in personal characteristics yield identical results. Samanni and Holmberg (2010) indicated that in developing countries and OECD nations, there is a strong correlation between the quality of government and happiness. Ott (2011), by measuring the quality of government based on the governance index, argued that the technical qualities of a government, such as the quality of control, rule of law, and control of corruption, have a larger impact on happiness than the democratic qualities of a government, such as participation, accountability, political stability, and so on. Tavits (2008) analyzed data from sixty-eight nations and surveys from sixteen European countries and stated that better quality of government is linked to higher points on the subjective well-being index. Many Korean scholars studied the relationship between the quality of government and quality of life. Bae's (2014) study indicated that the quality of government affects satisfaction and happiness and that quality of life is both the goal and product of government operations. Do (2016) stated that democratic participation and government effectiveness can be measured by the quality of the government and are a crucial part of the evaluation process. Choi *et al.* (2018) analyzed 144 countries focusing on the mediating effects of economic growth and stated that government effectiveness has a positive impact on economic growth and rule of law, citizen participation, and an increase in accountability are negative factors. Lee (2021) examined how the characteristics of a government influence the quality of life of its citizens by applying fuzzy-set analysis on data from OECD countries. The results showed that the quality of life is enhanced when the quality of the government, or its policy effectiveness, is maintained at a certain level, while an increase in government size, spending, and intervention has a negative impact. Habtumu (2008) assessed the role of institutions, in explaining the slow growth of Africa and the possible transmission channels, aggregate technical inefficiency through which institutions affect economic growth. The study estimated classical growth models using difference and system generalized method of moments (GMM). It was found that, rule of law, government effectiveness, regulatory quality, political instability and voice and accountability influences the growth of Sub-Saharan countries.

Fayisa and Nsiah, (2010) examined the extent to which institutional quality affects economic performance of 14 selected East African countries over the period 2005 – 2016 using fixed effect and system GMM methods. The finding confirmed that economic institutions matters for economic performance among which control of corruption and Government effectiveness has positive impact on the economic performance. Cooray, (2009) investigated the role of government in economic growth by extending the neoclassical production function to incorporate two dimensions of the government, which are the size and quality dimension. The

empirical result indicated that both the size and quality of Government are important for economic growth. It is argued that investing in the capacity for enhanced governance is a priority for the improved growth performance of the countries examined. Emara and Chiu (2016) evaluated the impact of governance on economic growth using a group of 188 countries. The study created a composite governance index that summarizes the existing six governance measurements. The study also quantify the marginal contribution of improvement in governance to economic performance using PPP adjusted constant per capita GDP in most of the oil rich MENA countries. Bayar (2016) examines the impact of six public governance indicators, including voice and accountability, political stability and absence of violence/terrorism, government effectiveness, and regulatory quality, rule of law and control of corruption on the economic growth in transitional economies of the European Union during the 2002-2013 period. The results showed that all governance indicators except regulatory quality had a statistically significant positive impact on economic growth Tarek and Ahmed (2013) investigated the impact of institutional quality on economic growth. Indeed. The main findings of the study is that improving the quality of political institutions is associated with a decrease in the level of corruption and a sustainable economic growth in developing countries. Lahouij, (2017) investigated the impact of governance and other growth determinants on economic growth of low-income economies using pooled cross-countries time series for the time span 2002-2014. The research found that governance is highly positively associated with economic development in developing countries regardless of their level of income. Uda and Ayara (2014) examined the institutions, governance structure and economic performance nexus in Nigeria using ordinary least square estimation technique and factor analysis to draw out important institutions and governance structure variables that should be the focus of policy. The result showed that government effectiveness, voice and accountability were not only significant but entered the regression line with the correct apriori signs

MATERIALS AND METHODS (DATA)

The data utilized in this study was the government effectiveness and the quality of life (proxies by Suicide Mortality Rate, Self-employment, control of Corruption, Rule of Law, Government Expenditure, Military Expenditure, Life expectancy at birth, Security of life and property, Infant Death Rate, people using at least basic sanitation service, People using safety managed drinking water services, people using safety managed sanitation services and Vulnerable employment for 20 years). The data was extracted from the world development indicators (WDI) database, (WDI, 2021).

Analytical Framework

This study utilized Multicollinearity, it is a common statistical issue that arises when two or more independent variables in a regression model are highly correlated with each other. In the context of multiple linear regression, it violates the assumption that predictor variables should be independent of each other. Multicollinearity can have several detrimental effects on regression model, some of which includes; unreliable coefficient estimates, difficulty in interpretation, loss of predictor significance, increased standard errors (Kutner *et al.,* 2005), instability of coefficients (Neter, *et al.,* 1989), misleading variable importance (Belsley *et al.,* 1980) over fitting (Hair *et al.,* 2010). Given these challenges, understanding how to detect, diagnose, and mitigate multicollinearity is crucial for researchers and analysts working with multiple linear regression models.

In this study, we are specifically interested in the relationship between Government Effectiveness *(Y)* and quality of life *(X_1 to X_{13})*. Understanding this relationship is of paramount importance for policymakers and researchers alike. Government effectiveness *(Y)* represents a measure of the effectiveness of government policies and services, while quality of life *(X_1 to X_{13})* comprises various indicators that encompass the overall well-being and satisfaction of individuals in a society. These quality of life indicators may include factors such as income, education, healthcare access, and more. However, as this study delve into the complex interplay between Government effectiveness and quality of life, it is vital to consider the potential presence of multicollinearity statistical phenomenon where the predictor variables (in this case, the quality of life indicators) may exhibit high correlations with each other. This could complicate our ability to discern the individual contributions of these indicators to Government Effectiveness, and hence, understanding multi-collinearity becomes crucial.

Variance Inflation Factor (VIF) is a commonly used diagnostic tool to quantify the extent of multi-collinearity. A VIF value greater than 10 is often considered indicative of problematic multi-collinearity (Kutner *et al.,* 2004). Additionally, Condition Index provides insights into the collinearity structure of the predictor variables, aiding in understanding the relationships among them (Belsley *et al.,* 1980). To address the potential challenge of multicollinearity, advanced statistical techniques are employed. Variance Inflation Factor (VIF) is calculated for each predictor variable to quantify the extent of multicollinearity. Predictor variables with high VIF values (>10) indicate potential collinearity issues. Additionally, the condition index is computed to assess the collinearity structure among predictor variables. Addressing multicollinearity is crucial to ensure the validity and robustness of regression analysis results. High multicollinearity can lead to unstable coefficient estimates, making it challenging to draw accurate inferences about the relationships between predictors and the dependent variable. Furthermore, it weakens the predictive accuracy of the model, as it becomes difficult to distinguish the unique impact of each predictor (Belsley et al., 1980). By comprehensively evaluating and mitigating multicollinearity, researchers can enhance the credibility of their regression analyses and make more informed policy recommendations.

Model Specification

The relationship between government effectiveness and quality of life of Nigerians is explicitly expressed as;

$$Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \varepsilon \quad (1)$$

Where;
Y = Government effectiveness
X_1 = Suicide mortality rate
X_2 = Self employed
X_3 = Control of corruption: Number of sources
X_4 = Rule of law: percentile rank
X_5 = Death rate
X_6 = General government final consumption expenditure
X_7 = life expectancy at birth

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X_8 = Military expenditure
X_9 = Number of infant deaths
X_{10} = People using safely managed drinking water
X_{11} = People using at least basic sanitation service
X_{12} = People using safely managed sanitation service
X_{13} = Vulnerable employment
ε = error term

βo is the constant term or the intercept while β_1 to β_{13} are the coefficient estimate of the explanatory variables, ε is the random error term, the dependent variable of this study is government effectiveness (Y) while the explanatory variables are $X_1 - to\ X_{13}$

The choice of suicide mortality rate, self-employed, control of corruption, rule of law, death rate, general government final consumption expenditure, life expectancy at birth, military expenditure, number of infant deaths, people using safely managed drinking water, people using at least basic sanitation service, people using safely managed sanitation service and vulnerable employment is based on quality of life of the citizens. These variables are life happiness indices that determine the quality of life, their influence on government effectiveness over the period under study.

RESULTS AND DISCUSSION

Table1 shows that there exist a weak and negative association between Government effectiveness and suicide mortality rate, death rate, general government final consumption expenditure, number of infant death, and vulnerable employment with correlation coefficient of; (r = -0.32), (r = -0.79), (r = -0.81), (r = -0.-07), (r = -0.40), and (r = -0.80) respectively. The result implies that improvement in Government effectiveness will result in 81%, 7%, 40% and 80% reduction in suicide mortality rate, death rate, general government final consumption expenditure, number of infant death, and vulnerable employment.

The result also indicated that, Government effectiveness has a positive correlation with, control of corruption, rule of law, life expectancy at birth, military expenditure, people using safely managed drinking water, using at least basic sanitation service, people using safely managed sanitation service, with correlation coefficient of; (r = 0.68), (r = 0.71), (r = 0.62), (r = 0.31), (r = 0.75), (r = 0.68) and (r = 0.69). The implication of this result is that, increased effectiveness of Governance will lead to; 68%, 71%, 62%, 31%, 75%, 68% and 69% increase in control of corruption, rule of law, life expectancy at birth, military expenditure, people using safely managed drinking water, using at least basic sanitation service, people using safely managed sanitation service respectively. The inter correlation between the explanatory variables indicated that none of the pair shows high level of correlation among themselves. This is an indication of absence of multicollinearity among the predictor variables. Table2 presents descriptive statistics for all variables in the study. This includes measures such as sum, mean, standard deviation, and distribution plots. These statistics provide an initial understanding of the data's characteristics. The diverse range of mean scores and standard deviations among the Quality of Life indicators highlights the heterogeneity of living conditions and well-being across Nigeria. These variations suggest that a one-size-fits-all approach to governance and development may not be suitable. Table3 shows the statistical analysis of the Government Effectiveness on quality of life in Nigeria given the general model of the research. The regression analysis result is highly perfect seeing that R = correlation coefficient = 0.995, the model explains 99.5% of the variation in the dependent variable, this implies that about 99% variation on Government Effectiveness is explained by the explanatory variable (quality of life in Nigeria). The R^2 = 0.990 shows that 99% of the variation in the dependent is explained by the independent variables with 1% unexplained. The adjusted R^2 = 0.973 gives the idea of how well the model generalizes. Table4 shows the ordinary least square model of the quality of life indices on Nigeria Government effectiveness. The estimated regression model was given as; $\hat{Y}$=$17.373 + 0.528_1X_1 - 2.219_2X_2 +, \ldots, + 2.692X_{13}$.

Table5 shows the partial correlation coefficient of the Government effectiveness on quality of life in Nigeria. The result revealed that there exist a moderate positive and significant correlation between the response and explanatory variables at the 0.05 level of significance. Using stepwise Regression and VIF statistics which ranges from 1< VIF < 10, it is observed that the quality of life variables had significant collinearity. Most of the independent variables were highly correlated with each other, except suicide mortality, control of corruption, rule of law, general government final consumption expenditure, military expenditure and number of infant mortality, representing variables X_1, X_3, X_4, X_6, X_8 & X_9 respectively The large range values of VIF corresponding to the variables show that there was problem of collinearity.

The F-value is presented in Table6, the result indicated F-value is considered statistically significant at p < 0.005 and it can be observed that the outputs from the analysis are not due to chance alone, that is there is significant different in the multicollinearity of the explanatory variables. Table7 shows the stepwise regression model result of quality of life of Nigerians on Government effectiveness. It was observed from the result that the quality of life variables has significant collinearity. From the value of VIF which is 1< VIF < 10; the result specified that the variables are highly correlated to each other, except variables X_1, X_3, X_4, X_6, X_8 & X_9. The large range values of VIF corresponding to the variables show that there is problem of collinearity. Table 6 also presented the result of Eigenvalue, tolerance, condition index and variance proportions. The multicollinearity among the variables is detected using the three techniques; variance inflation factor (majorly), correlation coefficients, and eigenvalue method (to further confirmed).

The estimated model is given as; $\hat{Y}$=$10.194 + -0.784_1X_1 - 0.608X_3 - 0.003X_4 + 0.000X_6 + 0.254X_8 + 0.000X_9$.

The result of the estimated coefficients indicates that suicide mortality rate has a negative and insignificant influence on government effectiveness at 5% probability level. The estimated coefficient of suicide mortality rate (-0.784) implies that 1% increase in suicide mortality rate will decrease government effectiveness by 7.84%, all things being equal. Control of corruption was found to be positively and significantly related to government effectiveness at 5% with an estimated coefficient of 0.608. This implies that a unit increase in corruption control will lead to an increase in Government effectiveness by a magnitude of 0.608. Rule of law had a negative sign but not significant at 5% probability levels while military expenditure was found to be positively related to government effectiveness but not significant at the chosen probability levels of this study.

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Table 1: Correlation Matrix of Government Effectiveness and Quality of Life Indices in Nigeria

	Y	*X1*	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*
Y	1													
X1	-0.32	1												
X2	-0.79	0.57	1											
X3	0.683	-0.27	-0.75	1										
X4	0.705	-0.65	-0.78	0.660	1									
X5	-0.81	0.678	0.774	-0.77	-0.79	1								
X6	-0.07	0.071	0.19	-0.04	-0.18	0.19	1							
X7	0.619	-0.66	-0.97	0.785	0.788	-0.79	-0.19	1						
X8	0.305	-0.68	-0.51	0.213	0.424	-0.55	-0.16	0.538	1					
X9	-0.40	0.31	0.25	-0.47	-0.43	0.27	-0.13	-0.29	0.018	1				
X10	0.751	-0.73	-0.96	0.698	0.604	-0.79	-0.19	0.889	0.599	-0.22	1			
X11	0.686	-0.77	-0.94	0.624	0.818	-0.77	-0.19	0.865	0.621	-0.19	0.793	1		
X12	0.684	-0.77	-0.94	0.623	0.819	-0.77	-0.19	0.896	0.620	-0.19	0.793	1	1	
X13	-0.80	0.561	1.000	-0.76	-0.78	0.75	0.191	-0.89	-0.50	0.248	-0.76	-0.8	-0.84	1

Table 2: Summary Statistics of Government Effectiveness and Quality of Life Indices in Nigeria

Statistics	Y	*X1*	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*
Mean	9.62	4.11	82.123	12.666	12.356	14.869	35.332	50.561	3.316	561784.1	17.846	34.85274	25.32827	80.10394
Std. Error	0.69	0.232	0.360	0.944	1.160	0.307	27.167	0.389	0.185	989.0678	0.536	0.979326	0.643266	0.372351
Median	11	4.4	81.932	15	12.676	14.628	4.427	50.945	3.320	562170	17.933	34.47029	25.07123	79.82669
Std. Dev.	3.15	1.061	1.651	4.328	5.320	1.40789	124.495	1.783	0.849	4532.478	2.461	4.487837	2.947816	1.706326
Sam. Var.	9.95	1.134	2.726	18.733	28.304	1.982	15499.11	3.180	0.721	20543358	6.088	20.14068	8.689617	2.911549
Kurtosis	3.39	11.717	-0.833	2.707	0.182	-1.018	18.728	-0.952	0.192	-1.24548	-1.196	-1.17626	-1.17558	-0.84467
Skewness	-1.8	-3.102	0.199	-1.809	-0.555	0.423	4.243	-0.498	0.604	-0.33972	-0.091	0.232163	0.239073	0.263219
Range	12	4.9	5.712	16	21.154	4.475	589.465	5.712	3.180	14350	7.948	14.0736	9.208983	5.87621
Minimum	0	0	79.268	0	0	12.989	-23.926	47.193	2.042	553472	13.724	28.64896	21.3005	77.224
Maximum	12	4.9	84.981	16	21.154	17.464	565.539	52.91	5.222	567822	21.669	42.72256	30.50949	83.10021
Sum	202	86.5	1724.574	266	259.497	312.254	741.963	1061.782	69.627	11797466	374.778	731.9075	531.8936	1682.183
Sample	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Table 3: Model Summary of Government Effectiveness and Quality of Life in Nigeria

Model	*R*	*R^2*	*Adj. R^2*	*Std. Error (β_i)*	*P-Value*
	.995	0.990	0.973	0.391	0.000

Predictors: (Constant), X_1 to X_{13}
Dependent Variable: Government Effectiveness (Y)

Table 4: Parameter Estimate of Government Effectiveness and Quality of Life in Nigeria

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Dependent Variable	*(β_i)*	*Std. Error*	*In(β_i)*	*t-cal.*	*P-val.*	*Tolerance*	*VIF*
(Constant)	17.373	92.698		0.187	0.856		
X_1	0.528	3.060	0.111	0.173	0.867	0.004	234.139
X_2	-2.219	5.267	-1.481	-0.421	0.685	0.000	6941.046
X_3	0.448	0.319	0.637	1.403	0.198	0.009	115.968
X_4	0.103	0.110	0.186	0.930	0.379	0.044	22.496
X_6	0.000	0.001	-0.008	-0.116	0.911	0.381	2.623
X_7	-1.395	1.864	-0.973	-0.749	0.476	0.001	949.636
X_8	0.149	0.212	0.047	0.701	0.503	0.398	2.510
X_9	0.000	0.000	-0.149	-1.582	0.158	0.169	5.929

X_{10}	4.502	2.709	4.319	1.662	0.135	0.000	3795.226
X_{12}	-2.387	1.877	-2.704	-1.272	0.239	0.000	2539.667
X_{13}	2.692	5.506	1.860	0.489	0.638	0.000	8132.482

Table 5: Partial Correlation and Collinearity Statistics of Government Effectiveness and Quality of Life in Nigeria

Excluded Variable	In (β)	t-cal. (β_i)	P-value		Tolerance	VIF
X_5	-26.015*	-3.015	0.020	-0.752	0.000	84124.145
X_{11}	45.771*	1.021	0.341	0.360	0.000	1136136.733

Predictors: (Constant), X_1 to X_{13}

Dependent Variable: Government Effectiveness (Y)

Table 6: ANOVA Result of Government Effectiveness and Quality of Life in Nigeria

Model	Sum of Square	D.F.	Mean Square	F_{cal}	P-Value
Regression	100.340	10	10.034	55.389	.000*
Residual	1.449	8	0.181		
Total	101.789	18			

Predictors: (Constant), X1 to X13
Dependent Variable: Government Effectiveness (Y)

Table 7: Test for the Presence of Multicollinearity of Government Effectiveness and Quality of Life in Nigeria

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics			
	(β_i)	*Std. Error*	*In(β_i)*	*t-cal.*	*P-val.*	*Eigen-value*	*Cond. Index*	*Tolerance*	*VIF*
Constant	10.194	27.477		0.371	0.717	5.892	1.000		
X_1	-0.784	0.555	-0.165	-1.412	0.183	0.939	2.504	0.153	6.515
X_3	0.608	0.052	0.865	11.582	0.000*	0.094	7.928	0.378	2.644
X_4	-0.003	0.050	-0.005	-0.052	0.960	0.042	11.816	0.255	3.928
X_6	0.000	0.001	-0.012	-0.234	0.819	0.031	13.882	0.838	1.193
X_8	0.254	0.193	0.080	1.315	0.213	0.002	59.824	0.570	1.754
X_9	0.000	0.000	-0.017	-0.223	0.827	0.000	849.131	0.354	2.827

Dependent Variable: Government Effectiveness

The VIF value greater than 1.5 indicates multicollinearity which is not the case with your X_6
1< VIF < 10 this is the condition for multicollinearity

Discussion of Findings

The results of this research offer valuable insights into the relationship between quality of life and Government effectiveness in Nigeria. A stepwise OLS model was developed with the presence of multicollinearity detected among the explanatory variables. The significant predictors identified in our regression model shed light on the key factors that influence the effectiveness of governmental institutions. The developed model; $\hat{Y}=10.194 - 0.784X_1 + 0.608X_3 - 0.003X_4 + 0.000X_6 + 0.245X_8 + 0.000X_9$ suggest a positive effect of corruption control on Nigeria Government effectiveness. It also indicates that improving these upon corruption control can potentially lead to enhanced Government performance. This finding is in agreement with the study by, Chima and Adams (2024), Tavits (2008) and Chukwuemeka, Ugwuanyi and Ewuim (2012), who concluded that, corruption is a critical problem for good governance in Nigeria as it reflects a crisis in the functioning of the public sector and as such should be a priority for government leadership to control. Effective fight against corruption in Nigeria requires a good and exemplary leadership with a strong will to fight corruption and with such high level of ethical and moral standards to be able to motivate and influence the citizens to voluntarily follow in the fight against corruption. The model also suggested that, military expenditure which implies improvement in security of the country positively influences Government effectiveness. This finding is corroborated by, Ibrahim (2013) in a study titled security, good Governance and its challenges to economic development, found that, the negligence of the security sector is responsible for the non-performance of democratic governance and its attendant violent crimes, such as armed robbery, ethnic crisis, electoral violence, kidnapping, and police brutality.

Conclusion

This study has detected the presence of multicollinearity in some of the explanatory variables that was proposed to influence Government effectiveness in Nigeria. The variables that high correlation among themselves (presence of multicollinearity) includes; self-employed, death rate, life expectancy at birth, people using safely managed drinking water, people using at least basic sanitation, people using at least basic sanitation service, people using safely managed sanitation service and vulnerable service. This highly correlated variable were removed from the model, while the remaining variables like; suicide mortality, control of corruption, rule of law, general government final consumption expenditure, military expenditure and number of infant deaths, were retained for the final modeling.

This study also presented the influence of the retained variables on Government's effectiveness in Nigeria. It was inferred from the result that suicide mortality rate has a negative and insignificant influence, control of corruption has a positive and significant effect, rule of law has a negative insignificant influence, general government final consumption expenditure, and number of infant deaths had no impact while military expenditure was found to have a positive but insignificantly effect on government effectiveness at 5% significance level. The study concludes that corruption and insecurity i.e. military expenditure are the major and significant problems that affects Nigeria Government effectiveness in service delivery and effective governance. The study suggested provision of an appropriate infrastructure for good governance, rule of law, overhauling the security sector in order to meet the challenges of law enforcement, surveillance and protective service delivery, creation of employment opportunities, and programmes to embark on total moral re-orientation of the citizens among others.

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