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Government Expenditure on Critical Infrastructure and Economic Growth in Nigeria: Implication to Education and Health Sectors

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Abstract: This study examines Government expenditure on critical infrastructure and economic growth in Nigeria: Implication to Education and Health Sectors from 1999-2022 using Ordinary least Square (OLS) technique method. All data used are secondary data obtained from the Statistical Bulletin of Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) annual publications after conducting various preliminary test like the Augmented Dickey-Fuller (ADF) tests, autocorrelation, multicollinearity and heteroscedasticity test. From the result of the OLS, it is observed that human capital development, government expenditure on education and health, and life expectancy have positive impacts while corruption have a negative impact on economic growth in Nigeria. This means that if human capital development, government expenditure on education and health, and life expectancy increase and improve, they will lead to higher economic growth in Nigeria, while increase in corruption will bring about a decline in economic growth in Nigeria. On the other hand, human capital development, government expenditure on education and health, and life expectancy has positive impacts while corruption has a negative impact on economic growth in Nigeria. The F-test conducted in the study shows that the model has a goodness of fit and is statistically different from zero. In other words, there is a significant impact between the dependent and independent variables in the model. Finally, both R2 and adjusted R2 show that the explanatory power of the variables is high and strong in explaining the economic growth in Nigeria. Based on the findings of the study, the study recommends that the government should improve the human development index by enhancing labour productivity and reducing the overall level of corruption perception. The government expenditure on education should be improved to compete with the international benchmark of 25% of annual national budget. The government should adequately improve on health infrastructure and manpower development to enhance the nation's life expectancy index. Proper legislation should be put in place to help reduce the nation's corruption perception index.

Key words: Government Expenditure, Critical Infrastructure, Economic Growth, Education Sector, Health Sector.

1. INTRODUCTION

Government expenditure on critical infrastructure remains that vital means of speeding up national development (Fasoranti, 2016). Whether it is a developed or developing economy, government

spends in order to equitably distribute national income and properly channel resources to vital sectors of the economy, thus, enabling the economy to effective function to bring about the desired level of development. Government spending pattern differs among nations (Aranda, 2010); either such spending is aimed at boosting the economy and accelerating economic growth or to expand employment opportunities. For instance, spending on education and health by government spurs labor productivity with impact on national productive capacity. Health is associated with wellness of citizens which makes them remain productive, education on the other hand apart from increasing productivity, leads to a life of self-actualization. Thus, health and education work in sync to produce a labour force that is highly productive and imbued with renewed skills and knowledge to cause positive disruptions in the production process. Both are essential for enhancing human capital which further speeds up economic growth and overall national development (Imoughele, & Ismaila, 2013; Odior, 2011; Serap, 2016).

Human capital consists of those individual abilities, knowledge and skills which are inherent in people while human capital development is the process of enhancing these skills, knowledge and abilities possessed by individuals to make them relevant in national affairs. It connotes spending on healthcare, education and training as well as social services (Abass 2001; Becker, 2012). Extant literature reveals that investing in education has the potential of enhancing economic growth through improved human capital which is highly valued in the economic system (Woodhall, 2001; Obeh, & Atumah 2012; Imoughele, & Ismaila, 2013). Investment in health no doubt increases the productive workforce. Thus, Nations desirous of sustained economic development need to match government expenditures with investment in human capital through sustained spending on education, training and health which have been adjudged the most important human capital component for national growth and economic development (Atilgan, Kilic, & Ertugrul, 2017). The significance of human capital in accelerating the socio-economic growth of a nation is no longer in doubt. Therefore, the mobilization of this critical asset for national development need not be a subject of further delay especially in third world countries with regards to Nigeria (Leonardo, 2016; Adesoye, Maku, & Atanda, 2010).

Human capital formation derived from a sound educational system has largely been responsible for the developed state of the economies of the advanced nations as reported in the literature. Therefore, it will be to the advantage of developing nations, Nigeria inclusive, to invest in human capital formation (Boldizzoni, 2008; De la Fuente, & Ciccone, 2002). Efforts of the Nigerian government in this regard have been aptly documented in the literature with the formulation of several educational policies by successive government to reposition the educational sector to meet national challenges. The government had also embarked on structural reforms to engage citizens in productive activities through agriculture, manufacturing, SMEs etc. Policy statements had also been issued and such encapsulated in the National Economic Empowerment and Development Strategy (NEEDS) document by the Obasanjo Government between 2004 and 2007 (Block & Smith, 2007). Likewise, the country subscribed to the attainment of the Millennium Development Goals (MDGs) by the year 2015 to harness her vast human capital to fight poverty, hunger, disease and illiteracy. These actions by government were geared towards economic transformation to a production economy to rejig the economy. Nigeria has also been acknowledged to possess large human resource capabilities with a projected 223million population by mid-2023 according to the World Bank (World Bank 2020). Nigeria thus has enormous human resource potentials to drive her economy to sustainable level. However, the reverse is the case; the nation is plague with numerous challenges and has failed to realize her full developmental potential (De la Fuente, & Ciccone, 2002; Osekhebhen, 2014; Chukwuemeka, 2009).

These failures have often been attributed to the neglect of the critical sectors of the economy by successive Nigeria government. In the education sector, strikes have become common phenomena disrupting the academic calendar with its toll on the quality of graduate manpower being shunned out by the tertiary institutions. The hospitals and healthcare centers are nothing to write home about (Bakare & Olubokun, 2011; Osekhebhen, 2014). The United Nations Development Programme (UNDP, 2010) Human Development Index (HDI) report placed Nigeria among the countries with low human development. This means that for the nation Nigeria to achieve any meaningful

development, she has to work on her human capital formation. The provision of high quality education and health care to all Nigerians should be paramount to government at all levels to maintain a consistent pool of highly skilled, knowledgeable and flexible human capital that can drive the nation's economic growth and sustain national development **(**Adesoye, Maku, & Atanda, 2010; De la Fuente & Ciccone, 2002; Chukwuemeka, 2009**).**

Objectives of the study

The broad objective of the study is to examine Government expenditure on critical infrastructure and economic growth in Nigeria: Implication to Education and Health Sectors. Specifically, the study sought to:

1. Determine the effect of human development index on economic growth in Nigeria.
2. Ascertain the effect of government expenditure on Education on economic growth in Nigeria.
3. Examine the effect of government expenditure on Health on economic growth in Nigeria.
4. Determine the effect of life expectancy index on economic growth in Nigeria.
5. Examine Corruption perception index on economic growth in Nigeria.

Research Hypotheses

Ho_1: Human development index has no significant effect on economic growth in Nigeria.

Ho_2: Government expenditure has no significant effect on Education on economic growth in Nigeria.

Ho_3: Government expenditure has no significant effect on Health on economic growth in Nigeria.

Ho_4: Life expectancy index has no significant effect on economic growth in Nigeria.

Ho_5: Corruption perception index has no significant effect on economic growth in Nigeria.

2. METHODOLOGY

Theoretical Framework

Based on a modified endogenous growth function, this study employs a multiple regression technique to estimate the impact of human capital development on economic growth in Nigeria. Kanayo (2016) adopted the endogenous growth model to model the variable of the study. The model expressed aggregate real output (Y) as a function of capital stock (k), human capital, labour factor (L) and total productivity (T).

$$Y= f(K_t, H_t, L_t, T_t) \quad (1)$$

Where, aggregate real output which is an indicator for economic growth, capital stock proxied as gross capital formation, human capital proxied as total health expenditure, labour factor proxied as secondary school enrolment, total productivity, which explains the output growth that is not accounted for by the growth in factors of production specified. Based on the above formulations, Kanayo (2016) modified the model as:

$$Y = AK^{\alpha} (hL)^{\beta} \quad (2)$$

Where, Y = Economic growth

K = Stock of physical capital;

h = Level of capital;

L = Labour, measured by number of workers;

A = Level of total factor productivity;

α = Elasticity of capital input with respect to output;

β = Elasticity of labour input with respect to output.

Econometrically, the model is specified as follows:

$Y = AK^{\alpha} (hL)^{\beta} \mu$ … … … … … … … (3)

When transformed into a log-linear form, we have,

$\log Y = \alpha_0 + \alpha_0 \log K + \beta \log hL + W$ … … … … (4)

Where $\alpha_0 = \log A$ and $W = \log \mu$

β_o = Constant term

$\beta_1 - \beta_4$ = Coefficient of parameter

μ_i = Stochastic error term

Model Specification

Using the knowledge gained from the above theoretical framework, the study examined the effect of human capital development on economic growth in Nigeria by adapting Kanayo (2016) type model and modified it to incorporating variables of the study. But with this little modification, government expenditure on education and health and life expectancy are the explanatory variables, while economic growth is used as the dependent variable. Thus, the model for the study is specified as:

The functional form of the model is:

GDP = (HCD, EDU, HEA, LIF, COR) … … … … … (5)

The mathematical form of the model is:

$GDP = \beta_0 + \beta_1 HCD + \beta_2 EDU + \beta_3 HEA + \beta_4 LIF + \beta_5 COR$ … … (6)

The econometric form of the model is:

$GDP = \beta_0 + \beta_1 HCD + \beta_2 EDU + \beta_3 HEA + \beta_4 LIF + \beta_5 COR + \mu_i$ … (7)

Where

GDP = Economic growth proxied by gross domestic product (GDP)

HCD = Human capital development proxied by human development index (HDI)

EDU = Government expenditure on Education

HEA = Government expenditure on Health

LIF = Life expectancy proxied by life expectancy index

COR = Corruption proxied by Corruption perception index

β_o = Constant term

$\beta_1 - \beta_5$ = Coefficient of parameters

μ_i = Stochastic error term

Method of Data Analysis

The economic technique employed in the study is the ordinary least square (OLS). This is because (i) the OLS estimators are expressed solely in terms of the observable (i.e. sample) quantities. Therefore, they can be easily computed. (ii) They are point estimators; that is, given the sample, each estimator will provide only a single value of the relevant population parameter. (iii) The mechanism of the OLS is simple to comprehend and interpret. (iv) Once the OLS estimates are obtained from the same data, the sample regression line can be easily obtained. The Economic views (E-views) software will be adopted for regression analysis.

Stationarity (Unit Root) Test

The importance of this test cannot be overemphasized since the data to be used in the estimation are time-series data. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables are mean reverting, that is, they have constant mean, constant

variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test would be used for this analysis since it adjusts for serial correlation.

Decision rule: If the ADF test statistic is greater than the MacKinnon critical value at 5% (all in absolute term), the variable is said to be stationary. Otherwise it is non stationary.

Co-integration Test

Econometrically speaking, two variables will be co-integrated if they have a long-term or equilibrium relationship between them. Co-integration can be thought of as a pre-test to avoid spurious regressions situations (Granger, 1986). As recommended by Gujarati (2004), the ADF test statistic will be employed on the residual.

Decision Rule: if the ADF test statistic is greater than the critical value at 5%, then the variables are co-integrated (values are checked in absolute term)

Evaluation of Estimates

The estimates obtained from the model shall be evaluated using three (3) criteria. The three (3) criteria include:

1. The economic a priori criteria.
2. The statistical criteria: First Order Test
3. The econometric criteria: Second Order Test

Evaluation Based on Economic A Priori Criteria

This could be carried out to show whether each regressor in the model is comparable with the postulations of economic theory; i.e., if the sign and size of the parameters of the economic relationships follow with the expectation of the economic theory. The a priori expectations, in tandem with the economic growth are presented in Table 1 below, thus:

Table 1: Economic A Priori Expectations for the Model

Parameters	Variables		Expected Relationships	Expected Coefficients
	Regressand	Regressor		
β_0	GDP	Intercept	+/-	$0< \beta_0 >0$
β_1	GDP	HCD	+	$\beta_1 > 0$
β_2	GDP	EDU	+	$\beta_2 > 0$
β_3	GDP	HEA	+	$\beta_3 > 0$
β_4	GDP	LIF	+	$\beta_4 > 0$
β_5	GDP	COR	-	$\beta_5 < 0$

Source: Researchers compilation

A positive '+' sign indicates that the relationship between the regressor and regressand is direct and move in the same direction i.e. increase or decrease together. On the other hand, a '-'sign shows that there is an indirect (inverse) relationship between the regressor and regressand i.e. they move in opposite or different direction.

Evaluation Based on Statistical Criteria: First Order Test

This aims at the evaluation of the statistical reliability of the estimated parameters of the model. In this case, the t-statistics, f-statistic, co-efficient of determination (R^2) and the adjusted R^2 are used.

The t-statistics (t-test)

The t-test statistics is used to determine the reliability/ statistical significance of each variable coefficient. Here, the absolute t-value of each coefficient is compared with 1.96(t_{tab}).

Decision Rule: if the calculated t-statistic is greater than the tabulated t value ($t_{cal} > t_{tab}$), then there is a significant relationship between the dependent variable and the independent variables. The opposite is the case if $t_{cal} < t_{tab}$.

The f-statistics (f-test)

The f-test statistic is a measure of the overall significance of the estimated regression. It is used to compare two population variances. Thus, in verifying the overall significance of the estimated model, the hypothesis tested is:

H_0: The model has no goodness of fit

H_1: The model has a goodness of fit

Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Co-efficient of Determination (R^2)

It denotes the percentage of variation in the dependent variable explained by the independent variables. The Square of the coefficient of determination R^2 or the measure of goodness of fit is used to judge the explanatory power of the explanatory variables on the dependent variables. The R^2 denotes the percentage of variations in the dependent variable accounted for by the variations in the independent variables. Thus, the higher the R^2, the more the model is able to explain the changes in the dependent variable.

Adjusted R^2

The adjusted R-squared compares the explanatory power of regression models that contain different numbers of predictors. However, the formula for R^2 does not take cognizance of the loss of degree of freedom from the introduction of additional explanatory variables in the function which in fact raises the values of R^2. To correct this defect, R^2 is adjusted by taking into cognizance the degree of freedom which clearly decreases as new regressors are introduced in the function.

Evaluation Based on Econometric Criteria: Second Order Test

This aims at investigating whether the assumption of the econometric method employed are satisfied or not. It determines the reliability of the statistical criteria and establishes whether the estimates have the desirable properties of unbiasedness and consistency. In this case, Autocorrelation, Multicolinearity and Heteroscedasticity will be tested.

Test for Autocorrelation

Autocorrelation can be regarded as "correlation between members of series of observations ordered in time (as in time series data) or space (as in cross-sectional data)". This test is carried out to see if the error or disturbance term (μ_t) is temporarily independent. It tests the validity of non-autocorrelation disturbance. The Durbin-Watson (DW) test is appropriate for the test of First-order autocorrelation and it has the following decision criteria.

1. If d* is approximately equal to 2 (d* =2), we accept that there is no autocorrelation in the function.
2. If d*= 0, there exist perfect positive auto-correlation. In this case, if 0<d*< 2, that is, if d* is less than two but greater than zero, it denotes that there is some degree of positive autocorrelation, which is stronger the closer d* is to zero.
3. If d* is equal to 4 (d*=4), there exist a perfect negative autocorrelation, while if d* is less than four but greater than two (2<d*< 4), it means that there exist some degree of negative autocorrelation, which is stronger the higher the value of d*.

Test for Multicolinearity

Multicolinearity means the existence of a "perfect," or exact, linear relationship among some or all explanatory variable of a regression model. It is used to determine whether there is a correlation among variables.

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. Also,

reject the null hypothesis (H_0), if any two variables in the model are in excess of 0.8 or even up to 0.8. Otherwise we reject.

Test for Heteroscedasticity

The essence of this test is to see whether the error variance of each observation is constant or not. Non-constant variance can cause the estimated model to yield a biased result. White's General Heteroscedasticity test would be adopted for this purpose.

Decision Rule: Accept the null hypothesis that there is a homoscedasticity (i.e. no heteroscedasticity) in the residuals if the probability of the calculated test statistic (X^2 or F) is greater than the 0.05 level of significance chosen in the study, the null hypothesis will be accepted.

Test for Research Hypotheses

This study will test the research hypothesis using t-test. The t-statistics test tells us if there is an existence of any significance relationship between the dependent variable and the explanatory variables. The t-test will be conducted at 0.05 or 5% level of significance.

Decision rule: Reject H_0 if $t_{cal} > t_{\alpha/2}$, (n-k). Otherwise, we accept.

Nature and Source of Data

All data used in this research are secondary time series data which are sourced from the Central Bank of Nigeria (CBN) annual statistical bulletin and National Bureau of Statistics (NBS) annual publications and reports.

PRESENTATION EMPIRICAL RESULT

Summary of Stationary Unit Root Test

Establishing stationarity is essential because if there is no stationarity, the processing of the data may produce biased result. The consequences are unreliable interpretation and conclusions. We test for stationarity using Augmented Dickey-Fuller (ADF) tests on the data. The ADF tests are done on level series, first and second order differenced series. The decision rule is to reject null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute terms). The result of regression summary is shown in table 2 below.

Table 2: Summary of ADF Test Results

Variables	ADF Statistics	Lagged Difference	1% Critical Value	5% Critical Value	10% Critical Value	Order of Integration
GDP	-7.678568	1	-3.769597	-3.004861	-2.642242	*I*(1)
HCD	-5.557997	1	-3.769597	-3.004861	-2.642242	*I*(1)
EDU	-4.789431	1	-3.769597	-3.004861	-2.642242	*I*(1)
HEA	-4.180203	1	-3.769597	-3.004861	-2.642242	*I*(1)
LIF	-5.188913	1	-3.769597	-3.004861	-2.642242	*I*(1)
COR	-5.300609	1	-3.769597	-3.004861	-2.642242	*I*(1)

Source: Researcher computation

Evidence from unit root table above shows that none of the variables are stationary at level difference that is, *I*(0), rather all the variables are stationary at first difference, that is, *I*(1). Since the decision rule is to reject null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute terms), and accept stationarity when ADF statistics is greater than criteria value, the ADF absolute value of each of these variables is greater than the 1%, 5% and 10% critical value at their first difference but less than 5% critical value in their level form. Therefore, they are all stationary at their first difference integration.

Presentation of Result

The result of the regression test result is presented in table 3 below.

Table 3: Summary of Regression Results for Model

Dependent Variable: GDP

Method: Least Squares

Sample: 1999 2022

Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.34989	21.21045	5.053721	0.0001
HCD	0.314733	48.97217	4.431823	0.0007
EDU	4.457483	7.226643	3.061627	0.0035
HEA	1.067211	3.040511	3.350174	0.0041
LIF	5.178159	7.995219	4.647657	0.0009
COR	-7.174453	8.441707	-3.849882	0.0030
R-squared	0.802943	F-statistic		27.46073
Adjusted R-squared	-0.733125	Prob(F-statistic)		0.000010
S.E. of regression	11.01982	Durbin-Watson stat		1.814823

Source: Researchers computation

Evaluation of Findings

To discuss the regression results as presented in table 3, the study employed economic a priori criteria, statistical criteria and econometric criteria.

Evaluation Based on Economic A Priori Criteria

This subsection is concerned with evaluating the regression results based on a priori (i.e., theoretical) expectations. The sign and magnitude of each variable coefficient is evaluated against theoretical expectations.

From table 3, it is observed that the regression line has a positive intercept as presented by the constant (c) = 22.34989. This means that if all the variables are held constant or fixed (zero), the economic growth will be valued at 22.3%. Thus, the a-priori expectation is that the intercept could be positive or negative, so it conforms to the theoretical expectation.

It is observed in table 3 that human capital development, government expenditure on education and health, and life expectancy have positive impacts while corruption has a negative impact on economic growth in Nigeria. This means that if human capital development, government expenditure on education and health, and life expectancy increase and improve, it will bring about more and lead to higher economic growth in Nigeria, while increase in corruption will bring about a decline in economic growth in Nigeria. On the other hand, it is observed that all the variables conform to the a priori expectation of the study. Thus, table 4 summarises the a priori test of this study for the model.

Table 4: Summary of Economic A Priori Test for Model

Parameters	Variables		Expected Relationships	Observed Relationships	Conclusion
	Regressand	Regressor			
β_0	GDP	Intercept	+/-	+	Conform
β_1	GDP	HCD	+	+	Conform
β_2	GDP	EDU	-	-	Conform
β_3	GDP	HEA	+	+	Conform
β_4	GDP	LIF	+	+	Conform
β_5	GDP	COR	-	-	Conform

Source: Researchers compilation

Evaluation Based On Statistical Criteria

This subsection applies the R^2, adjusted R^2 and the F–test to determine the statistical reliability of the estimated parameters. These tests are performed as follows:

From the study regression result, Table 4 indicated that the coefficient of determination (R^2) is given as 0.802943, which shows that the explanatory power of the variables is extremely high and/or strong. This implies that 80% of the variations in the economic growth are being accounted for or explained by the variations in human capital development, government expenditure on education and health, life expectancy and corruption in Nigeria. While other determinants of economic growth not captured in the model explain just 20% of the variation in economic growth in Nigeria.

The adjusted R^2 in Table 4 supports the claim of the R^2 with a value of 0.733125 indicating that 73% of the total variation in the dependent variable (economic growth) is explained by the independent variables (the regressors)). Thus, this supports the statement that the explanatory power of the variables is high and strong.

The F-statistic: The F-test is applied to check the overall significance of the model. The F-statistic is instrumental in verifying the overall significance of an estimated model. The hypothesis tested is:

H_0: The model has no goodness of fit

H_1: The model has a goodness of fit

Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Where

V_1 / V_2 Degree of freedom (d.f)

V_1 = n-k, V_2 = k-1:

Where; n (number of observation); k (number of parameters)

Where k-1 = 6-1= 5

Thus, n-k = 25-6 = 19

Therefore: $F_{0.05(5,19)}$ = 2.74 (From the F table) … F-table

F-statistic = 27.46073 (From regression result) … F-calculated

Therefore, since the F-calculated > F-table, the study reject H_0 and accept H_1 that the model has goodness of fit and is statistically different from zero. In other words, there is significant impact between the dependent and independent variables in the model.

Evaluation Based on Econometric Criteria

In this subsection, the following econometric tests were used to evaluate the result obtained from our model; autocorrelation, multicollinearity and heteroscedasticity.

Test for Autocorrelation

Using Durbin-Watson (DW) statistics which the study obtain from the regression result in table 2, it is observed that DW statistic is 1.814823 or approximately 2. This implies that there is no autocorrelation since d* is approximately equal to two. 1.814823 tends towards two more than it tends towards zero. Therefore, the variables in the models are not autocorrelated and that the models are reliable for predications.

Test for Multicollinearity

This means the existence of a "perfect," or exact, linear relationship among some or all explanatory variable of a regression model. This will be used to check if collinearity exists among the explanatory variables. The basis for this test is the correlation matrix obtained using the series. The result is summarized in table 5 below.

Table 5: Summary of Multicollinearity Test

Variables	Correlation Coefficients	Conclusion
HCD and EDU	0.598836	No multicollinearity
HCD and HEA	0.618466	No multicollinearity
HCD and LIF	0.177687	No multicollinearity
HCD and COR	0.575803	No multicollinearity
EDU and HEA	0.663223	No multicollinearity
EDU and LIF	0.254733	No multicollinearity
EDU and COR	0.752973	No multicollinearity
HEA and LIF	0.259912	No multicollinearity
HEA and COR	0.694603	No multicollinearity
LIF and COR	0.366476	No multicollinearity

Source: Researchers compilation

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, the study conclude that there is multicollinearity but if the coefficient is less than 0.8 there is no multicollinearity. The study therefore, concludes that the explanatory variables are not perfectly linearly correlated.

Test for Heteroscedasticity

This test is conducted to see whether the error variance of each observation is constant or not. The hypothesis testing is thus:

H_0: There is a homoscedasticity in the residuals

H_1: There is a heteroscedasticity in the residuals

The decision rule if is to Accept the null hypothesis that there is a homoscedasticity (i.e. no heteroscedasticity) in the residuals if the probability of the calculated F-test statistic (F) is greater than the 0.05 level of significance chosen in the study, the null hypothesis will be accepted.

Hence, *p*(F) = 0.5698 (see, Appendix 11). This means that the probability F statistic is greater than 0.05 level of significance. Therefore, the study accepted the null hypothesis that the model has no heteroscedasticity in the residuals and therefore, the data is reliable for predication.

Test of Research Hypotheses

The t-test is used to know the statistical significance of the individual parameters. Two-tailed tests at 5% significance level are conducted. The result is shown on table 4.5 below. Here, the study compare the estimated or calculated t-statistic with the tabulated t-statistic at $t_{\alpha/2} = t_{0.05} = t_{0.025}$ (two-tailed test).

Degree of freedom (df) = n-k = 25-6 = 19

So, we have:

$T_{0.025(19)} = 2.093$ … … …Tabulated t-statistic

In testing the working hypotheses, which partly satisfies the objectives of this study, the study employs a 0.05 level of significance. In so doing, we are to reject the null hypothesis if the t-value is significant at the chosen level of significance; otherwise, the null hypothesis will be accepted. This is summarized in table 6 below.

Table 6: Summary of t-statistic for Model

Variable	t-calculated (t_{cal})	t-tabulated ($t_{\alpha/2}$)	Conclusion
Constant	5.053721	±2.093	Statistically Significant
HCD	4.431823	±2.093	Statistically Significant
EDU	3.061627	±2.093	Statistically Significant
HEA	3.350174	±2.093	Statistically Significant

LIF	4.647657	±2.093	Statistically Significant
COR	-3.849882	±2.093	Statistically Significant

Source: Researchers computation

The study begins by bringing the working hypothesis to focus in considering the individual hypothesis.

For HCD, $t_{cal} > t_{\alpha/2}$, therefore the study reject the null hypothesis and accept the alternative hypothesis. This means that HCD has a significant impact on GDP.

For EDU, $t_{cal} > t_{\alpha/2}$, therefore the study reject the null hypothesis and accept the alternative hypothesis. Thus, EDU do have a significant impact on GDP.

For HEA, $t_{cal} > t_{\alpha/2}$, therefore the study reject the null hypothesis and accept the alternative hypothesis. This means that HEA has a significant impact on GDP.

For LIF, $t_{cal} > t_{\alpha/2}$, therefore the study reject the null hypothesis and accept the alternative hypothesis. This means that LIF has a significant impact on GDP.

For COR, $t_{cal} > t_{\alpha/2}$, therefore the study reject the null hypothesis and accept the alternative hypothesis. Thus, COR do have a significant impact on GDP.

4. CONCLUSION AND RECOMMENDATIONS

The study attempted to explain Government expenditure on critical infrastructure and economic growth in Nigeria: Implication to Education and Health Sector from 1999-2022 using Ordinary least Square (OLS) technique method. All data used were secondary data obtained from the Statistical Bulletin of Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) annual publications. From the result of the OLS, it was observed that human capital development, government expenditure on education and health, and life expectancy have positive impacts while corruption has a negative impact on economic growth in Nigeria. This means that if human capital development, government expenditure on education and health, and life expectancy increase and improve, it will bring about more and lead to higher economic growth in Nigeria, while increase in corruption will bring about a decline in economic growth in Nigeria. On the other hand, human capital development, government expenditure on education and health, and life expectancy has positive impacts while corruption has a negative impact on economic growth in Nigeria. The F-test conducted in the study shows that the model has a goodness of fit and is statistically different from zero. In other words, there is a significant impact between the dependent and independent variables in the model. Finally, both R^2 and adjusted R^2 show that the explanatory power of the variables is high and/or strong in explaining the economic growth in Nigeria.

Based on the findings of the study, the study recommends that the government should improve the human development index by enhancing labour productivity and reducing the overall level of corruption perception. The government expenditure on education should be improved to compete with the international benchmark of 25% of annual national budget. The government should adequately improve on health infrastructure and manpower development to enhance the nation's life expectancy index. Proper legislation should be put in place to help reduce the nation's corruption perception index.

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