

## NON-OIL REVENUES AND ECONOMIC DEVELOPMENT IN NIGERIA: A HUMAN DEVELOPMENT PERSPECTIVE

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### Abstract

*This study seeks to evaluate the extent to which non-oil revenues in Nigeria influence her economic development, using human development index as a key indicator of development. Statistical techniques employed include stationarity, Johansen's Co-integration, error correction, and Granger causality tests. The results showed that personal income tax per capita has a positive and significant influence on Nigeria's human development index. Company income tax per capita displays a positive and insignificant influence on human development index even at lag one, while capital gains tax per capita demonstrates a negative and insignificant influence on the human development index at both current and one year lag. Customs and excise duties per capita indicate an inverse and insignificant influence on the human development index while royalty income per capita shows a negative and insignificant influence on the Nigeria's human development index at both current and one-year lags. In the light of these findings, the study recommends that; Personal income tax revenue collections should be increased through proper linkage of Nigeria's taxable adults' vital information like national identity card particularly with bank verification numbers and the individual potential payers' bank accounts details for assessment purposes in order to minimize tax evasion and avoidance.*

*Keywords: Non-oil Revenue, Company Income Tax, Human Development Index, Economic Development.*

### Introduction

Fundamental distortions created by the existence of inequalities in income distribution have posed impediments on gross domestic product and per capita income as fair societal welfare measures. In this sense, Chinweoke, Ireokwu, Izuchukwu, and Ogeh (2017) as well as Onodugo (2013) observed that the employment of the gross

domestic product as an indicator of economic growth leads to the false conclusion that the economy is growing even when there prevails a significant reduction in job creation capacity, increased poverty among the populace, as well as obvious inequality in the distribution of income. In view of these obvious limitations, Abomaye-Nimenibo, Eyo, Mni, and Chika (2018)

argued that an objective measures of economic development should incorporate income, employment, investment, plant expansions, relocations, and births.

In another development, Mahmud (2002) aggregated many of the aforementioned variables into an index (Human Development Index), in accordance with specified weights or measures of composition as categorized into life expectancy measures, education (literacy rate, gross enrollment ratio, and net attendance ratio), as well as per capita income indicators. Consequently, human development index like other accepted indicators of economic development including income per capita and poverty index has been accepted as an objective indicator of the level of economic development in sovereign nations. However, poverty index is viewed as a converse criterion with respect to human development index. Principally because it concentrates on the deprivation of the three accepted and essential elements of human life which have already been reflected in the human development index (HDI).

The fundamental role of the government justifies the focus on human development index as an economic development indicator. The reason is that, sanitation; health care, freshwater usage, elementary education, adequate shelter, and a clean environment are the ultimate goals of governments (Igbiosa, 2016). According to Vincent (2017), if governments could significantly provide better education and health services for their citizens, human capital investment will increase. This will consequently, affect the economy in a positive way in the long term. Gupta (2007) contended that government spending on education and health sectors could bring positive effects on human capital. This study

argued that this would cause an economy to grow, while reducing poverty. Romer and Lucas (1988) argued that high levels of human capital would accelerate technological advancement and economic development by making the labor force more innovative.

The contributions of the non-oil sector to Nigeria's economy have continued to attract attention at policy and academic levels over the years. In this direction, Riti, Gubak, and Madina (2016) posited that Nigeria's non-oil sector constitutes generally, all other groups of economic activities that are outside the petroleum and gas industry. In this vein, they, constitute serious sources of revenue for the State to function and build a meaningful society. Primarily defined as revenues accruing to the government not directly derived from crude oil, non-oil revenues embrace different forms of revenues from taxes, duties, royalties as well as the sales of public assets. Tax is conceived as a compulsory but non-penal levy by the government through its agents on the profits, income, or consumption of her subjects or citizens. It could also be viewed as those compulsory and obligatory contributions made by individuals and organizations towards defraying the expenses of government as observed by Ojong, Bassey, and Edung (2016).

Essentially, Kindleberger and Herrick (1977), as well as Todaro and Smith (2009), observed that while the concept of economic growth emphasizes the quantitative dimensions of national progress in terms of weight and growth as indicated by the employment of gross domestic product (GDP), economic development on the other hand, conceptually entails the qualitative dimensions of national economic progress. Accordingly, these studies insist that economic development emphasizes

issues that revolve around income distribution, the standard of living, health care, poverty levels, human development measures, and the standard of education among others. On the other hand, other studies including Arowoshegbe, Emmanuel and Osasere (2017), Awe and Ajayi (2009), Ifeacho, Omoniyi and Olufemi (2014), Omodero, Ekwe and Ihendinihu (2018), and Riti et al., (2016) took a quantitative perspective and evaluated the interrelationships between Nigeria's non-oil revenues and her economic development on the employment of the corresponding proxies with valuable results.

Controversies have raged among financial analysts and policymakers as to why the fiscal policy instrument of taxation is not efficient, and what other viable tax policies could be implemented to ensure the achievement of the desired national development of Nigeria. In the course of this argument, certain issues and questions have been raised about the influence of taxation on development in Nigeria as to whether there are any significant effects of taxation on national development in Nigeria.

This study adopts the human development index (HDI) to measure economic development because it encompasses weighted socio-economic indicators, such as per capita income, infant mortality, adult literacy, access to clean portable water, life expectancy at birth, etc. In this vein, this study attempts to ascertain the nature of sensitivities of Nigeria's human development index as an economic development indicator to her non-oil revenue resources. It covers the period 1981 to 2019 (40 years) due largely to limitations imposed by data availability. Its geographical scope is as well, confined to Nigeria. However, available literature from other countries is significantly incorporated. On

the whole, it is hoped that the results will assist fiscal policy managers with verifiable information on the empirical relevance of public sector material and human capital expenditures in Nigeria, especially as they relate to the nation's economic development. Further, the results are hoped to be of valuable assistance to the government for any possible moderation of public sector capital investment expenditures, programs, and policies when necessary.

While an overview has been provided above, the rest of this study is rendered in four parts. Section 2 offers the theoretical framework and literature review while section 3 deals with the materials and methods. Section 4 addresses the presentation of the results, while section 5 concludes the study with discussions, conclusions, and recommendations.

### **Literature Review**

This section is discussed under the following sub-sections:

#### **Endogenous Growth Theory**

Initially expressed in the studies of Solow (1956) and later popularized by the studies of Barro (1990), Raja and Rebelo (1990) and Romer (1986), endogenous growth theory incorporates a diverse framework for both theoretical and empirical studies that gained popularity. The following initial studies of Solow (1956) theory predict that government expenditure and tax will have both temporary and permanent effects on per capita income as an economic progress indicator. In this vein, previous studies including Barro (1990) as well as Raja and Rebelo (1990) observed that taxation creates market distortions. The resulting productive expenditures would therefore, influence the long term growth rate of the economy.

Endogenous growth theory holds that economic progress depends on some critical factors which include investment in human capital, innovation and knowledge management. Endogenous growth theory invariably supports all legitimate measures which governments undertake to boost revenue generation. These policies include encouragement of exploration of revenue earning opportunities. In a sense, internal revenue generation capacities differ among states because of their different endowments.

However, the central government clearly articulates in accordance with the constitution, a defined set of fiscal federalism in order to ensure an orderly system and avoid encroachments by the different levels of government as observed by Omodero, Ekwe, and Ihendinihu (2018). Ideally, endogenous growth theory requires state intervention in order to mitigate the adverse effects of distortions in resource allocation due to market failure. The theory therefore, ameliorates private sector productivity, while minimizing monopolistic tendencies and spill-over effects as observed by Ojong, Basse, and Edung (2016). In this sense, even classical economists according to Bhatia (1980) as well as Barber (1979), argued strongly in favour of taxation.

#### **Keynesian View of Tax:**

Barber (1979), Bhatia (1980) as well as Jhingan, Giriga, and Sasikala (2013) viewed Keynesian thinking on taxation and any implied tax cuts in the economy as a tool of improving disposable income in favour of the lower class. It improves their consumption level as their incomes are taxed at lower rates, invariably, inducing more consumption and investment expenditures. Ultimately, taxation induces economic growth as well as reduction in

income inequality. Fundamentally, the increased disposable income for the poor goes back as money in circulation as it enhances their expenditure on consumables according to Freeman (2006). Obviously, Keynesian view on tax is purely from the demand side and interestingly, advocates for tax policies that do support consumption, especially direct taxes. Direct taxes are progressive and the proportion of tax payment increases with income. Keynesian approach consequently, proves that the market is not always at equilibrium and as such, necessitates an urgent need for government intervention in order to encourage growth, investment and employment.

#### **Empirical Review:**

Kizilkaya, Koçak, and Sofuoğlu (2015) evaluated the impact of selected non-oil revenues sources by government on the human development empirically over the period of 1998-2007 for 14 OECD countries. Panel unit root, cointegration, FMOLS, DOLS and vector error correction based causality methods were employed in the study. According to the panel FMOLS results, while the revenue sources have a negative influence on human development, government expenditures and income has a positive impact on it. The study also found that government expenditures and electricity consumption have a positive effect on human development. However, the coefficients of income and taxes were not statistically significant. Causality test results showed that in the long term, causality flowed from taxes, government expenditures, electricity consumption and income to human development. Also, causality flowed from taxes, government expenditures, human development and electricity consumption to income.

In a similar study, Harelimana (2018), estimated the influence of tax revenue on economic development in Rwanda over the period of 2013 to 2016. The study utilized secondary data. On employment of regression technique, the study found prevalence of a positive and significant relationship between tax revenue and Rwandan economic development. The study concluded that tax revenue was important in predicting Rwanda's economic development and consequently recommended improved tax administration strategies in order to lower the cost of tax collection in Rwanda, ensure equity, and above all, facilitate rapid economic development through rational state expenditures and investments.

Okeke, Mbonu, and Ndubuisi (2018) examined the nature of interrelationships between tax revenue and economic development in Nigeria over the period 1994-2016. The study employed the augmented Dickey-Fuller, multiple regression, Granger causality, Johansen Co-integration test and Error Correction techniques in analyzing the data. The findings showed that tax revenues as utilized in funding government spending have statistically significant relationships with infant mortality, labor force productivity and gross fixed capital formation in Nigeria. The study consequently recommended enhanced tax collection efforts and strategies in order to boost government revenues and enhance development projects.

Palić, Žmuk, and Grofelnik, (2017) estimated the long run influence of personal income tax on economic development of Croatia. Monthly data were employed over the period 2000 to 2016. Further, employment of the Engle-Granger Co-integration technique revealed a significant long-run relationship between personal income tax and Croatia's economic

development. Also, the error correction model estimates revealed a significant long-run negative sensitivity of Croatia's economic development to variations in Croatia's personal income tax revenues. The study recommended improved tax administration and distribution system in order to address the negative influence of taxation on Croatia's economic welfare.

Riti, Gubak, and Madina (2016), examined the influence of non-oil revenue growth on economic performance in Nigeria, over the period 1981 to 2013. The study employed the auto-regressive distributed lag (ARDL), vector error correction and Granger causality tests to estimate the short run and long run parameters, as well as the direction of causality among the variables. The results showed that variations in the non-oil revenues significantly influenced economic development in Nigeria. The study recommended improved administrative efforts to enhance non-oil revenue collection as well as guided investment of same to improve the nation's progress.

Nnaseh and Akpan (2013) investigated the effects of internally generated revenue on infrastructural development in Akwa Ibom State, Nigeria. The study employed secondary data sourced from Akwa-Ibom State Government's annual budget appropriation as well as the State's Board of Internal Revenue Annual Report and Statement of Accounts. The multiple regression results obtained on application of the revenue elements as explanatory variables for the State's expenditures on water, electricity and road construction provided evidence of significant positive relationships between these revenue elements and Akwa Ibom governments' expenditures. Further, variations in those revenue elements explained a reasonable percentage of the variations in government

expenditure. Effective management and administration of these revenue elements were recommended in order to ensure enhanced development of Akwa-Ibom State, Nigeria.

Awe and Ajayi (2009) investigated the nature of interrelationships that prevail between non-oil revenues and Nigeria's economic development over the period 1980-2018. On employment of secondary data and utilization of unit root test, Johansen Co-integration and error correction technique, the findings revealed that a significant long-run relationship prevails between the set of explanatory variables and Nigeria's economic development. However, the error correction results revealed significant long-run sensitivities of Nigeria's economic development to variations in proceeds from agriculture, and solid mineral sectors. However, Nigeria's economic development was found to be statistically insensitive to changes in proceeds of the manufacturing sector. The study called for significant additions to investments in Nigeria's agricultural and solid minerals sectors. Further, the study recommended that public investments in basic infrastructures like roads, electricity, and transportation should be enhanced to boost the manufacturing sector's output and contribution to the economy.

Viccaro, Rocchi, Cozzi, and Severino (2015) investigated the effect of revenues accruing from royalties on regional developments in Italy over the period 1995 to 2012. The study employed a multi-sector regression analysis. The findings showed that royalty allocations to various regional governments had significantly, lower than the expected effects on regional economic developments in Italy. The study attributed those results to the fact that externalities arising from investment of royalty proceeds

might have benefited people of other regions, especially in terms of employment opportunities.

Barreto, Linares, and Armenta (2011) evaluated the influence of royalties earned from natural resources on local development in Colombia from 1996 to 2006. The royalties' approximated official rental proceeds which Colombia received from firms engaged in exploitation of non-renewable natural resources. Employing income per capita as a proxy for economic development, the study found on employment of simple regression analysis, a weak and statistically insignificant sensitivity of Colombia's per capita income to variations in royalty proceeds. To this end, the study called for strategic investment of royalty proceeds in Colombia to ensure that full beneficial effects were derived.

Nwafor (2018) examined the effect of non-oil revenues on Nigeria's economy over the period 2004 to 2013. The study employed multiple regression technique. The findings revealed that Nigeria's economy was significantly sensitive to changes in non-oil revenue proceeds. It therefore, recommended diversification of non-oil exports as a panacea for accelerated growth of Nigeria's economy.

Ramot and Ichihashi (2012) utilized panel data from 65 countries covering the period 1970 to 2006 to examine the effects of tax structure on income inequality and economic growth in selected countries. Panel data regression was employed. The results showed that company income tax rates have significant negative effects on income inequality and economic growth. On the contrary, the results also provided evidence that the personal income tax rates did not significantly affect income inequality and economic growth in the selected 65 economies. The study recommended the

implementation of the optimal corporate tax rate in order to avoid instances where company income taxes may become counter-productive in the economies selected.

Arnold, Brys, Heady, Johansson, Schwellnus, and Vartia (2011) examined the nature of the long-run relationship between tax structures, per capita income, and recovery within the membership of the organization for economic cooperation and development (OECD) countries. The annual panel data involved 51 countries. Error correction test was employed. The individual tax indicators were expressed as shares of the tax revenue elements along with the study's explanatory variables which include physical capital, human capital, population growth rates etc. The ratio of tax revenue to nominal GDP served as the control variable. Further employed, were the lagged forms of the dependent variable in both their level and first difference forms to account for

transitional dynamics. The findings indicated that long-run per capita income could be improved upon by gradually increasing taxes on consumption and immovable property as well as improving the design of individual taxes. Personal & corporate income taxes, as well as consumption and immovable property taxes, proved to have less adverse effects on long-run GDP per capita in the 51 member countries studied.

### Methodology

For clarity, this part is discussed under the following sub-headings:

#### Data and Employed Variables Description:

The data for this study were collected from Central Bank of Nigeria's Statistical Bulletin, Federal Inland Revenue Service Boards, Knoema.com, as well as World Bank Publications over the period 1981 to 2019 as shown in Appendix 1. Further derived from Appendix 1 are the per capita derivatives shown as Table 1 below:

**Table 1: Human Development Index (HDI), Personal Income Tax per capita (PIT/P), Company Income Tax per capita (CIT), Capital gains tax per capita (CGT/P), Custom and excise duties (CED/P), and Royalties per capita (ROY/P) in Nigeria, 1981 - 2019:**

Year	HDI %	PIT/P %	CIT/P %	CGT/P %	CED/P %	ROY/P %
1981	0.397	26.46	5.34	63.42	30.81	58.7
1982	0.356	9.45	7.1	209.95	30.15	12.0
1983	0.325	8.94	7.07	349.14	24.97	0.8
1984	0.363	7.13	9.66	113.15	19.83	1.8
1985	0.423	11.23	12.01	247.56	26.11	18.0
1986	0.393	5.05	12.85	141.9	20.14	48.0
1987	0.38	4.63	14.02	495.52	40.19	6.9
1988	0.371	5.98	17.15	498.99	62.71	14.0
1989	0.378	10.1	20.62	502.05	62.64	20.7
1990	0.322	18.1	31.46	189.89	90.7	1.9
1991	0.328	31.11	39.17	507.22	117.23	20.6
1992	0.348	48.92	54.05	509.34	160.19	37.4
1993	0.389	54.75	92.97	511.13	150.7	8.7
1994	0.384	36.91	116.51	500.47	173.65	61.2
1995	0.453	189.21	202.56	371.53	345.93	34.5
1996	0.393	30.77	208.61	457.82	496.69	134.8

1997	0.456	73.47	244.88	306.8	554.96	227.7
1998	0.439	97.95	286.12	216.72	4,957.65	1,864.3
1999	0.455	168.44	387.17	105.66	736.63	2,082.3
2000	0.462	311.4	435.63	198.48	8.3	2,724.7
2001	0.46	353.89	553.15	314.36	13.6	3,265.6
2002	0.466	529.27	692.49	222.4	14.1	3,959.7
2003	0.445	410.69	869.88	176.6	14.81	4,476.5
2004	0.463	435.03	834.6	141.47	16.04	4,773.0
2005	0.477	1,526.56	1,009.79	648.86	16.76	5,573.6
2006	0.477	233.5	1,717.22	688.67	12.46	6,518.5
2007	0.481	1,835.17	1,880.25	165.04	16.49	12,365.8
2008	0.492	1,187.25	2,993.07	650.77	18.71	15,900.7
2009	0.492	1,476.02	4,080.90	411	19.27	16,724.1
2010	0.500	4,489.90	4,489.90	594.22	19.5	17,270.7
2011	0.507	4,948.52	4,948.52	26.67	26.91	13,940.0
2012	0.514	5,757.42	5,757.42	281.37	26.27	17,127.9
2013	0.521	5,605.56	48,133.04	61.28	23	18,092.4
2014	0.525	5,515.12	1,896.53	91.59	24.03	21,678.2
2015	0.527	5,389.80	23,145.25	517.03	23.14	33,036.9
2016	0.53	5,655.15	5,019.30	534.46	31.74	39,044.8
2017	0.526	5,653.16	6,365.34	16.66	46.8	36,561.6
2018	0.534	5,544.58	1895.69	1.38	36.35	40,282.3
2019	0.532	5584.938	1777.231	17.95	40.94	40,241.13

**Source:** Derived from Appendix 1.

The study conceives Per capita income (PCI) as the ratio of gross domestic product (market value of goods and services) at a time in Nigeria to total population, Human Development Index (HDI) as the Composite World Bank index of life expectancy, education, average income, standard of education, quality of health care, quality of good water supply etc., Poverty Index (PI) as a weighted index of standard of living in a county, longevity, knowledge, health standard and security adopted from the United Nation's index database. Personal Income Tax (PIT) as total revenues accruing from direct tax levied on the income of persons per year in Nigeria, measured in millions of Naira and taken as ratio of population, Company Income Tax (CIT) as the total periodic tax revenues on the profits of incorporated businesses in Nigeria, which

includes the tax on the profits of non-resident companies carrying on business in Nigeria and is measured in millions of Naira and taken as ratio of population.

Capital Gains Tax (CGT) as tax revenues realized on the sale of non-inventory assets over a year, which is measured in millions of Naira and taken as ratio of population, Customs and Excise Duties (CED) as the aggregated duties levied on imported goods into Nigeria (Customs), as well as those levied on goods manufactured within the country (Excise), which was measured in millions of Naira and taken as ratio of population, and Royalty Income (ROY) as the aggregated periodic royalties paid by registered mining firms to the government in Nigeria excluding oil and gas royalties as reported by the Department of Petroleum Resources (DPR) over the study



period, which was similarly measured in millions of Naira and taken as ratio of population.

**Model Specifications**

Following the studies of Ul Haq (1995), Ghura (1998), Ul Haq, Kaul and Grunberg (1996) as well as Okeke, Mbonu, and Nduibuisi (2018), this study employed human development index as a proxy for economic development. However, because human development index is a weighted index of composite factors, this study consequently adopted the per capita (ratio values) of the explanatory variables proposed in equation 1. Accordingly, human development index is formulated as a function of the explanatory variables (non-oil revenue) elements employed as follows;

$$HDI = f(PIT/P, CIT/P, CGT/P, CED/P, ROY/P). \tag{1}$$

**Where;**

- HDI = Human development index
- PIT/P = Personal income tax per capita
- CIT/P = Company income tax per capita
- CGT/P = Capital gains tax per capita
- CED/P = Customs and excise duties per capita
- ROY/P = Royalties per capital

For estimation purposes, equation 1 is re-written as follows to accommodate the estimation parameters;

$$HDI_t = \beta_0 + \beta_1PIT/P_t + \beta_2CIT/P_t + \beta_3CGT/P_t + \beta_4CED/P_t + \beta_5ROY/P_t + \pi_t \tag{2}$$

**Where;**

HDI retain its previous notation,  $\beta_0$ , represents the constant for equation 1, while  $\beta_1$ -  $\beta_5$  are the respective coefficients for PIT/P, CIT/P, CGT/P, CED/P, and ROY/P in equation 1. Further  $\pi_t$  is the error

(stochastic) term for the estimated equations.

**Apriori Expectations:**

Theoretically, it is expected that increased State funding of projects and related expenditures as investment programmes would have multiplier effects on the disposable income and general living conditions of the citizenry in Nigeria. It is thereby, expected to improve the general human development in Nigeria, given the constituent elements of human development index. In effect, the sensitivity of Nigeria’s human development index to increased non-oil revenue resources is expected to be greater than zero, given increases in State spending/investment programmes.

In summary, we have that;

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0,$$

**Specification of Analytical Tools and Tests**

The core objective of this study is to ascertain empirically, the influences of increased government investment/expenditure programmes on economic development in Nigeria. For clarity, this sub-part is further detailed as follows;

**Stationarity Tests:**

The stationarity attributes of the time series data was verified by employment of unit root tests in order to validate their employment and avoid spurious estimates. In this exercise, according to Brooks (2009), the Augmented Dickey Fuller (ADF) test is relevant. The decision rule is to reject the implied null hypothesis if the ADF test statistic on absolute basis, is greater than all associated Mackinnon’s Critical Values at 1%, 5% and 10% levels respectively.

**Johansens’s Cointegration Test:**

Johansen's Co-integration test aims at ascertaining the significance of any prevailing long run equilibrium relationship among a chosen set of study variables (Brooks, 2009). The decision rule implied is that the magnitude of the Trace/Max-Eigen statistic must be more than the associated critical value at 0.05 levels.

#### Error Correction Estimates.

Brooks (2009) demonstrated that error correction estimates tend to evaluate the long term sensitivities of the explained variable to each of the independent variables. Further, it shows the rate at which the explained variable adjusts back to long run equilibrium following short run distortions in the explanatory variables.

#### Granger Causality Test:

According to Brooks (2009), the Pairwise-Granger causality test attempts to evaluate the extent to which variations in a given set of explanatory variables tend to support or promote changes in the dependent variable. Further, it demonstrates the extent, to which addition of lagged or past values of the variables tend to improve the explanation and vice versa in accordance with equations (3) and (4) below;

$$y_t = \beta_0 + \sum_{i=k}^n \beta_i y_{t-i} + \sum_{i=k}^n \beta_{i+1} X_{t-i} + \mu_t \quad (3)$$

$$X_t = \alpha_0 + \sum_{i=k}^n \alpha_i y_{t-i} + \sum_{i=k}^n \alpha_{i+1} X_{t-i} + V_t \quad (4)$$

#### Presentation of Results:

##### Presentation of Stationarity Test Results:

The results of stationarity test executed are presented in table 2 below:

**Table 2: Results of Stationarity (Unit Root) Test at level**

Variable	ADF T-statistics	Mackinnon's test critical values @			Probability Level	Order of Integration	Decision
	At Level	1%	5%	10%			
HDI	-0.725277	-3.632900	-2.948404	-2.612874	0.8273	0(0)	Not stationary
PITPC	-1.372329	-3.699871	-2.976263	-2.627420	0.6986	0(0)	Not stationary
CIT/PC	-1.530918	-3.699871	-2.976263	-2.627420	0.7392	0(0)	Not stationary
CGT/PC	-2.034835	-3.626784	-2.945842	-2.611531	0.1102	0(0)	Not stationary
CED/PC	-2.308877	-3.626784	-2.945842	-2.611531	0.2115	0(0)	Not stationary
ROY/PC	-0.146279	-3.752946	-2.998064	-2.638752	0.9327	0(0)	Not stationary

**Source:** Extracts from E-Views 10.0 output.

The results of the test for the stationarity of employed variables at levels shown in table 2 above indicate that none of the study variables is stationary at level because all the ADF t-statistics are absolutely lower than all the Mackinnon's test critical values at 1%, 5% and 10% respectively. As

such, their significance levels are far lower than 0.05 minimum acceptance level. Due to the insignificance of the study variables at level, the study proceeded to evaluate the stationarity of the employed variables at first difference. The results are presented below in table 3.

**Table 3: Results of Unit Root Test: (Augmented Dickey Fuller) at First Difference.**

Variable	ADF T-statistics	Mackinnon's test critical values @			Probability Level	Order of Integration	Decision
	1st difference	1%	5%	10%			
D(HDI)	-8.407534***	-3.632900	-2.948404	-2.612874	0.0000	I(1)	Stationary
D(PIT/PC)	-5.737456***	-3.769597	-3.004861	-2.642242	0.0001	I(1)	Stationary
D(CIT/PC)	-4.553106***	-3.699871	-2.976263	-2.627420	0.0000	I(1)	Stationary

D(CGT/PC)	-8.767163***	-3.632900	-2.948404	-2.612874	0.0000	I(1)	Stationary
D(CED/PC)	-8.802553***	-3.632900	-2.948404	-2.612874	0.0000	I(1)	Stationary
D(ROY/PC)	-4.990043***	-4.571559	-3.690814	-3.286909	0.0046	I(1)	Stationary

\*\*\* sign at 10%, 5% and 1%, \*\* sign at 10% and 5%.

**Source:** Extracts from E-Views 10.0 output.

The stationarity test results at first difference presented in table 3 above shows that all the employed variables are significant at first difference. The results therefore, confirm absence of any unit root in the time series. To that extent therefore, all the employed variables are confirmed reliable for further estimations with minimal possibility of biases in long run estimations as well as satisfy conditions for employment in Johansen Co-integration analysis. In the light of the observed stationarity, the study therefore proceeded to the cointegration test.

**Presentation of Johansen Co-integration Test**

To evaluate the extent to which a valuable long run relationship prevailed among the employed variables, the study employed the Johansen’s cointegration technique. The results of the Johansen’s cointegration analysis are presented in table 4 below.

**Presentation of Johansen Co-integration Test**

The Johansen’s Cointegration results for the study variables with human development index as proxy for economic development are shown in table 4 below:

**Table 4: Johansen Cointegration Test Results:**

Date: 08/04/20 Time: 11:37

Sample (adjusted): 1984 2019

Included observations: 36 after adjustments

Trend assumption: Linear deterministic trend

Series: D(HDI) D(PIT/PC) D(CIT/PC) D(CGT/PC) D(CED/PC) D(ROY/PC)

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.884537	176.4434	95.75366	0.0000
At most 1 *	0.610086	103.0441	69.81889	0.0000
At most 2 *	0.527867	71.02186	47.85613	0.0001
At most 3 *	0.448587	45.50505	29.79707	0.0004
At most 4 *	0.370824	25.26586	15.49471	0.0013
At most 5	0.244042	9.512153	3.841466	0.8620

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05
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No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.884537	73.39936	40.07757	0.0000
At most 1 *	0.610086	32.02221	33.87687	0.0019
At most 2 *	0.527867	25.51681	27.58434	0.0098
At most 3 *	0.448587	20.23919	21.13162	0.0063
At most 4 *	0.370824	15.75370	14.26460	0.0089
At most 5	0.244042	9.512153	3.841466	0.8620

Max-eigenvalue 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:** E-Views 10.0 output extract

The above results of Johansen's Co-integration analysis on employment of human development index as proxy for economic development indicate that, both the Trace and Maximum Eigen statistics show the presence of five significant co-integrating equations. It confirms prevalence of significant long run relationship between Nigeria's non-oil revenue elements and economic development as measured by human development index (HDI).

#### **Determination of Lag Lengths Selection Criteria for Employment of Error Correction Model:**

Establishment of lag lengths is essential for error correction estimations, principally because of the fact that previous investments of revenue proceeds may begin to have effects on economic development in a later period. To ascertain the most suitable lag for the time series, the study proceeded to evaluate the lag length selection criteria. Basically, suitable lag length determination would enable the study to determine the appropriate lag to infuse into the error correction model. Table 5 below shows the results of lag length selection criteria output.

**Table 5: Lag Length Selection for Nigeria's Human Development Index (HDI):**

VAR Lag Order Selection Criteria

Endogenous variables: D(HDI) D(PIT/PC) D(CIT/PC) D(CGT/PC)

D(CED/PC) D(ROY/PC)

Exogenous variables: C

Date: 08/04/20 Time: 11:44

Sample: 1981 2019

Included observations: 36

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1481.702	NA	3.35e+29	85.01152	85.27816	85.10356
1	-1377.084	167.3881*	6.86e+27*	81.09052*	82.95694*	81.73481*
2	-1342.163	43.90138	8.84e+27	81.15214	84.61835	82.34868
3	-1244.253	89.51723	4.50e+26	77.61446	82.68045	79.36324

\* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

**Source:** E-Views 10.0 output extract

The results of lag length selection for human development index (HDI) shown in table 5 above indicate that a maximum lag of 1 is ideal for the estimated model. The various criteria values suggest that the first (1) lags of D(HDI) D(PIT/PC) D(CIT/PC) D(CGT/PC), D(CED/PC) and D(ROY/PC) which represent the respective differenced values of human development index, per capita personal income tax, per capita company income tax, per capita capital gains tax, per capita customs and excise duties and per

capita royalties are ideal and appropriate. In the light of the above results presented in table 5, the study proceeded to use the first lag (1) of all employed variables.

**Presentation of Error Correction Model Estimations;**

To ascertain the nature of long run dynamics in the study model, error correction estimation was employed. The results are presented in table 6 below;

**Table 6: Results of Error Correction Model Estimation Output:**

Dependent Variable: D(HDI)

Method: Least Squares

Sample (adjusted): 1983 2019

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004708	0.005178	0.909167	0.3710
D(PIT/PC)	9.89E-07	2.577663	3.839940	0.0006
D(PIT/PC-1)	3.72E-06	5.73E-06	0.648398	0.5217
D(CIT/PC)	1.96E-08	4.18E-07	0.046918	0.9629
D(CIT/PC-1)	3.15E-08	6.98E-07	0.045160	0.9643
D(CGT/PC)	-2.48E-06	2.00E-05	-0.123993	0.9022
D(CGT/PC-1)	4.19E-06	2.55E-05	0.164034	0.8708
D(CED/PC)	-1.40E-06	4.85E-06	-0.289012	0.7747
D(CED/PC-1)	-4.46E-07	6.22E-06	-0.071755	0.9433
D(ROY/PC)	-3.86E-07	2.16E-06	-0.178718	0.8594
D(ROY/PC-1)	2.97E-07	1.02E-06	0.292236	0.7721
ECM(-1)	-0.316296	0.150948	-2.095397	0.0074
R-squared	0.622424	Mean dependent var		0.004846
Adjusted R-squared	0.565629	S.D. dependent var		0.027675
S.E. of regression	0.028569	Akaike info criterion		-4.096141
Sum squared resid	0.022853	Schwarz criterion		-3.785072
Log likelihood	-78.68247	Hannan-Quinn criter.		-3.988760
F-statistic	6.510091	Durbin-Watson stat		2.081170

Prob(F-statistic) 0.020164

**Source:** E-Views 10.0 output extract

The error correction estimates shown in table 6 above indicate that in the long run, after adjusting for short-run distortions, variations in the study's explanatory variables jointly explain 62.24% of human development index in Nigeria. The ECM has an expected negative sign. Its associated F-statistic value of 6.510091 has a probability of 0.020164 which is significant at 5% level. It thus, confirms a good line of fit. Further, the model's Durbin-Watson Statistic of 2.081170 is within the acceptable range. The absolute value of the ECM is 31.62%, thus implying that 31.62% of the disequilibrium in Nigeria's human development index (HDI) is offset by short-run adjustments in the explanatory (predictor) variables yearly. The ECM value of 31.62% is also associated with a probability value of 0.0074, which is statistically significant at the 0.05 level.

In the long run, it can be observed that personal income tax passes the significance test with respect to human development index (HDI) in the Nigerian

economy. This shows that variations in Nigeria's long-run human development index relate significantly with revenues generated from personal income taxes. All lagged revenue values have insignificant influences on human development index (HDI). This might be as a result of the fact that Nigeria might be spending all revenues generated from personal income taxes within the relevant fiscal/financial year. This might have resulted from the fact that significant proportions of the personal income tax proceeds are statutorily collected by State governments and consistently spent within the same fiscal period.

#### **Pairwise Granger Causality Estimation:**

To ascertain the extent to which the employed variables of this study do support, promote and/or re-inforce themselves in the process of growth, this study executed the pair-wise Granger causality tests, the results of which are shown below in table 7:

**Table 7: Results for Pairwise Granger Causality Test Estimation**

Pairwise Granger Causality Tests

Date: 08/04/20 Time: 12:16

Sample: 1981 2019

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(PIT/PC) does not Granger Cause D(HDI)	36	9.00094	0.0005
D(HDI) does not Granger Cause D(PIT/PC)		0.03165	0.9689
D(CIT/PC) does not Granger Cause D(HDI)	36	0.01026	0.9898
D(HDI) does not Granger Cause D(CIT/PC)		0.01414	0.9860
D(CGT/PC) does not Granger Cause D(HDI)	36	0.02842	0.9720
D(HDI) does not Granger Cause D(CGT/PC)		0.10309	0.9024
D(CED/PC) does not Granger Cause D(HDI)	36	0.06862	0.9338

D(HDI) does not Granger Cause D(CED/PC)		4.35745	0.0221
D(ROY/PC) does not Granger Cause D(HDI)	36	0.08497	0.9188
D(HDI) does not Granger Cause D(ROY/PC)		0.01407	0.9860

**Source:** E-Views 10.0 output extract

The results shown in table 7 above for Nigeria's human development index indicate prevalence of two significant unidirectional causalities. These flow from; (i) personal income tax per capita to human development index (HDI) and from (ii) human development index (HDI) to customs and excise duties. This shows that growth in personal income tax significantly promotes Nigeria's human development index. Further, growth in Nigeria's human development index also significantly supports growth of customs and excise duties.

These results are realistic and emanate from the fact that increased revenues from personal income tax tend to additionally fund increased government expenditures. Through multiplier effects, they tend to impact on human development index. Also, improved human development index would invariable enhance quality living standards which probably arise from increased health and other life comforting expenditures, much of which derive from expenditures on imported/locally produced quality goods, thereby attracting payments of customs and excise duties by importers and local producers.

### Conclusions and Recommendations

From the results of this study it is concluded that Personal income tax is the only variable that significantly explains human development index in Nigeria as an economic development indicator among the employed study variables, while company income tax, capital gains tax, customs and

excise duties, and royalties are not valuable in predicting human development index as an economic development indicator in Nigeria.

### Recommendations

In accordance with the results of this study, it is recommended that; (i) personal income tax revenue collections should be increased through proper linkage of Nigeria's taxable adults' vital information like national identity card, bank verification numbers and the individual potential payer's bank account details. This measure is important in order to minimize tax evasion and avoidance. (ii) State governments should develop a robust data base on personal income tax payers with the aim of identifying all possible sources of income of taxpayers in order to increase the tax base.

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## Appendix

### Appendix 1

**Appendix 1(a): Human Development index (HDI), Personal Income Tax (PIC), Company Income Tax (CIT), Capital Gains Tax (CGT), Custom and excise duties (CED) and Royalties (ROY) in Nigeria, 1981 -2019:**

Year	HDI %	PIT N'M	CIT N'M	CGT N'M	CED N'M	ROY N'M
1981	0.397	1,997.30	403	4,787.16	2,325.80	4,427.2
1982	0.356	732.5	550	16,265.29	2,336.00	928.1
1983	0.325	710.1	561.5	27,743.43	1,984.10	60.5
1984	0.363	580.9	787.2	9,221.56	1,616.00	143.4
1985	0.423	938.9	1,004.30	20,699.69	2,183.50	1,501.1
1986	0.393	433.7	1,102.50	12,177.82	1,728.20	4,118.9
1987	0.38	407.6	1,235.20	43,655.96	3,540.80	606.1
1988	0.371	540.5	1,550.80	45,134.09	5,672.00	1,269.1
1989	0.378	938	1,914.30	46,612.22	5,815.50	1,922.3
1990	0.322	1,724.00	2,997.30	18,090.35	8,640.90	177.1
1991	0.328	3,040.40	3,827.90	49,568.49	11,456.90	2,016.8
1992	0.348	4,903.10	5,417.20	51,046.62	16,054.80	3,746.2
1993	0.389	5,626.50	9,554.10	52,524.75	15,486.40	896.5
1994	0.384	3,888.20	12,274.80	52,727.00	18,294.60	6,447.0
1995	0.453	20,436.40	21,878.30	40,130.00	37,364.00	3,726.8
1996	0.393	3,407.00	23,100.00	50,696.00	55,000.00	14,931.0
1997	0.456	8,340.00	27,800.00	34,829.00	63,000.00	25,845.1
1998	0.439	11,400.00	33,300.00	25,223.00	577,000.00	216,972.3
1999	0.455	20,100.00	46,200.00	12,608.00	87,900.00	248,475.5
2000	0.462	38,100.00	53,300.00	24,285.00	1,015.00	333,366.8
2001	0.46	44,400.00	69,400.00	39,441.00	1,706.00	409,708.4
2002	0.466	68,100.00	89,100.00	28,615.00	1,814.00	509,478.7
2003	0.445	54,200.00	114,800.00	23,306.00	1,955.00	590,778.9

<b>2004</b>	0.463	58,900.00	113,000.00	19,154.00	2,172.00	646,238.8
<b>2005</b>	0.477	212,100.00	140,300.00	90,152.00	2,328.00	774,395.4
<b>2006</b>	0.477	33,300.00	244,900.00	98,214.00	1,777.00	929,636.2
<b>2007</b>	0.481	268,700.00	275,300.00	24,164.00	2,414.00	1,810,563.8
<b>2008</b>	0.492	178,500.00	450,000.00	97,841.00	2,813.00	2,390,623.5
<b>2009</b>	0.492	227,900.00	630,100.00	63,460.00	2,975.00	2,582,238.0
<b>2010</b>	0.5	712,000.00	712,000.00	94,230.00	3,092.00	2,738,753.0
<b>2011</b>	0.507	806,000.00	806,000.00	4,344.00	4,383.00	2,270,502.8
<b>2012</b>	0.514	963,200.00	963,200.00	47,073.00	4,394.20	2,865,449.1
<b>2013</b>	0.521	963,200.00	8,270,667.00	10,530.00	3,952.70	3,108,811.1
<b>2014</b>	0.525	973,200.00	334,662.00	16,162.00	4,239.60	3,825,340.6
<b>2015</b>	0.527	976,533.00	4,193,496.00	93,677.00	4,191.70	5,985,684.9
<b>2016</b>	0.53	1,051,800.00	933,537.00	99,403.40	5,903.00	7,261,929.2
<b>2017</b>	0.526	1,079,111.00	1,215,057.00	3,180.30	8,933.50	6,979,107.4
<b>2018</b>	0.534	1,086,042.80	371,317.00	270.70	7119.07	7,890,290.0
<b>2019</b>	0.532	1,122,369.20	357,158.70	3606.8	8227.60	8,087,001.25

**Sources:** 1. Central Bank of Nigeria Statistical Bulletin (2019), 2. Federal Inland Revenue Service Board (2019), 3. Knoemia.com (2019), World Bank (2019).