

## Tax Revenue Buoyance and Human Capital Development in Nigeria

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### Abstract

*Efficient and buoyant tax systems are essential in achieving sustainable economic growth, human development and infrastructural development. The study examined tax revenue buoyance and human capital development in Nigeria, using secondary data extracted from the period 1970 to 2021. The study employed ordinary least square regression to dissect the relationship between human development index and tax revenue buoyance variables. The study found out that petroleum profit tax buoyance has no significance effect on human capital development in Nigeria at a P-value of 0.8466 but company income tax buoyance has significance impact on human capital development in Nigeria at a P-value of 0.0369. It is recommended that the use of tax revenue information mining, training, tax net expansion, tax process re-engineering will enhance tax administration and reduce government revenue leakages so that the needed human development in terms of education, improve life expectancy and better living standard is achieved.*

**Keywords: Tax Revenue Buoyance, Human Capital Development, Human Development Index.**

### 1. INTRODUCTION

An efficient and buoyant tax system are key *factors* in government quest to achieve sustainable economic growth, human development, infrastructural development and enhance the realization of the sustainable development goal by 2030 as agreed in the Addis Ababa Action Agenda in 2015 (Osirim, et. al., 2022). However, in Africa and other low-income countries, tax revenue has significantly contributed towards the human capital development needs, gross domestic product and other economic development indices. Tax has continually been used as a macroeconomic policy instrument to determine the pace and the level of economic growth being a fiscal stabilizer of nations (Omojemite & Godwin, 2017). Government could depend on taxation as the most effective and efficient instruments of generating internal revenues, create employment, aid fiscal stability and improve human capital development (Okere, et. al., 2022). The debate on tax in the global stage as a means of revenue generation to enhance economic development without impairing the tax base has been an issue of discuss in literature and practice (Abiola, et al., 2021).

A tax buoyancy of one signifies that a 1 percent incremental change in GDP would be created by a 1 percent incremental change in increase tax revenues and this will make the tax-to-GDP ratio unchanged. Tax buoyancy greater than 1 would imply that tax revenue generated in a particular period rise more than gross domestic product; buoyancy that is more than is the desired of most nations which implies availability of more revenues that

will enhance fiscal stability and support economic development over time (Gupta, et. al., 2022). Despite the revenue generated, the Nigeria 2022 multidimensional poverty index of 0.257 is among the worst and the human development index of 0.535 for 2021 is on a negative threshold depicting that greater percentage (63%) of the Nigerian population live below the poverty line (world bank, 2022). Okere, et. al., (2022) study revealed that the country is ranked among the economically less developed nation that has been grappling with other macro-economic problems such as high rate of unemployment, high inflation rate, multidimensional poverty, tax gap, high tax avoidance, high tax evasion, poor tax administration system, unfair tax, narrow tax base, low tax compliance and multiple taxation which has eroded the revenue base of Nigeria. A buoyant and productive tax system offer government the most efficient and effective means of generating tax revenues that promote sustainable economic growth and for human capital development without eroding the tax base.

However, Nigeria's huge tax gap, currently estimated at 6 per cent of GDP, highlights the country's inefficiency in tax enforcement and abysmal tax performance (NBS, 2022). This is a cause for concern as a resource-endowed nation. The foregoing narratives go to show that the Nigerian tax system is inefficient, despite the oil boom in 2021 post Covid 19 pandemic, amended finance Act of 2021, the medium term expenditure framework, the ICT aided tax administration through Tax Promax, tax incentives and other memorandum of understanding considerations to boost revenue; these inefficiencies like tax evasion, tax avoidance, lack of tax compliance, poor tax administration, unfair assessment, lack of accountability, multiple taxation, lack of tax data, no transparency and increased corrupt tendencies has continued to bewildered the Nigerian tax system (Okere, et. al., 2022).

Human capital is viewed as the skills; knowledge, competence and other characteristics encompassed in economic elements imbue during their life and used for productive purposes or creating market niche circumstances (OECD, 2017). Statistically, human capital can be measured in monetary terms as the total potential future earnings of the working age population. However, this only captures part of human capital and is a limited measure (Pettinger, 2019). The Human Development Index (HDI) is an integrated metrics of the mean attainment in key dimensions of development of human: which include health care, education and decent living standard; the HDI is the geometric mean of normalized indices for each of the three dimensions (IMF, 2021). The creation of HDI was to emphasize that country's development is attained through channelling the resources generated on improving the people capabilities (Organization for Economic Co-operation and Development, 2022). This statistic supports the claims made by Todaro (1980), Wilson (2017) and Harbison (1973), where they stated that human resources are the ultimate source of a country's prosperity. Nigeria ranks 163 out of 191 nations with a low HDI of 0.535 (UNDP, 2021).

Broadly, Countries facing dwindling revenue has with low yield tax revenue due lax in enforcement of tax laws during challenging times (Otemu, 2020). However, the World Bank, Organization for Economic Co-operation and Development (OECD), and the G20 nations have been clamouring a more determined approach to discourage tax evasion and avoidance. Likewise due to the fact that most economies are combating with the shock of global financial and economic crisis resulting from the impact of Covid 19 pandemic, Ukraine-Russia invasion and civil unrest thereby creating pressure for tax havens, tax reforms, economic reforms, tax structural reforms, tax accountability and need for fiscal transparency of tax systems (Singoro, 2021).

Okere, et.al, (2022) highlighted that many developing countries in Africa are challenged with the issue of generating revenue as a result inefficient human and natural

capital mismanagement evidence in their deficit budgeting system, high inflation, revenue leakages, poor tax administration which hampers investment in human capital development. The constrained net oil revenues, combined with non-oil revenues that are constrained by limited tax policy reforms and are thus stagnated (relative to GDP), limit overall revenue realization, thus constraining budget execution and the build-up of fiscal buffers. However, in the quest for sustainable growth, Nigeria, like many other countries, has underinvested in human capital because the Nigeria Economic Recovery and Growth Plan (ERGP) 2017-2020 aims to achieve macroeconomic stability and economic diversification with special focus on human capital development was never implemented in full (World Bank, 2022). However, nations have not been able to recoup revenues as government expenditure needs grows tremendously due to social and environmental needs; this has forced most countries to utilize the option of internal or external borrowing thereby trading off fiscal sustainability (IMF, 2021).

Therefore, Tax buoyancy which represents the growth in revenue that keeps the fiscal balance in check is a vital ingredient of an effective tax system. It also measures how tax revenues vary with changes in output (Ojonago, et. al., 2016). Tax buoyancy measures the relationship between historical tax revenue and GDP in terms of proportional increase in tax revenue creating one percent change in GDP that is tax buoyancy is the composite of the change in revenue from tax creating variation in GDP and change in tax rate and tax base (Nalraj, 2016). Tax buoyancy refers to an absolute percentage change in tax incomes which has considered discretionary movement of the tax, in relation to percentage change in income (Abiola, et. al., 2021). The tax system of Nigeria would depend on the efficiency and effectiveness of how buoyant the tax revenue generated from the system can be legally, structurally transparently fine-tuned to capture the responses of tax revenues changes to changes in national income including changes by discretion made by countries to their system of taxation (Ojonago, et. al., 2016).

### 2.1.2 Tax Revenue Buoyance

The metrics of tax buoyance is conceptualized on the principle of response of a tax revenue source on discretionary manipulations of the tax policies, reforms and variation in tax rate that create a change in the national income (Elosiuba & Chuwuma, 2017). The discretionary variations are the variation, which result in accruing more revenue from tax having the same tax base. The sources of such changes are changes in tax legislation or tax reforms not changes in the tax rate” (Musa, et. al., 2016). The knowledge of optimal expenditure level requires the conceptualization of tax buoyance which is designed as the behavioral pattern of tax revenue to variation in GDP adjusting for discretionary changes in tax policies. It helps in identifying sustainable revenue sources, required tax structure modification, tax administration inefficiencies that can be remedied, tax compliance issues that mitigate revenue generation, use of ICT measures to management remittance gateway and tax collection and utilization accountability. Ideally, a tax is considered buoyant if there are natural growths in tax revenues, which did not result from a rise in the tax rate, which tax elasticity represent (Osirim, et. al., 2022).

Tax Buoyancy along with tax elasticity can generally be used to evaluate the performance of a tax type or the whole tax system (Shome, 1998). Tuan (2003) adumbrated that tax buoyancy is the ratio between the real growth rate of tax revenues and the real growth rate of GDP. Generally, a buoyant tax arises when revenues rise by more than one percent for a one percent rise in GDP. Tax buoyancy estimates the response of income. “The buoyancy of a tax system shows reaction of revenue generated from tax to variation in

nations' income as well as impact of discretionary variations in tax policies over time (Blanchard, et. al., 2010). A buoyancy coefficient of one indicates that 1% change in tax revenue create a 1% variation in the GDP, therefore the tax to GDP ratio remains constant. If the coefficient of tax buoyancy is greater than 1 therefore the revenue from tax exceeds the gross domestic product which could and potentially lead to reductions in the deficit ratio to meet development needs; when country faces revenue problems, it indicates that tax buoyance is less than one. (IMF, 2017). The coefficients exhibited by buoyance illustrate the economic and administrative challenges in raising and collecting revenue; it also reveals the stabilizing policies and conscious discretionary revenue policies (fiscal monitor, 2015).

### **2.1.3 Petroleum Profit Tax Revenue Buoyance**

Osirim, (2016) described Petroleum profit tax unarguably is the most buoyant and lucrative federally collected tax in Nigeria as oil and gas accounts for over 80% of the nation's foreign earnings. No doubt, petroleum profit tax is a major indicator to consider when discussing economic performance of Nigeria. The operating business environment is changing rapidly both in Nigeria and in the other countries and without adequate reforms, the Nigeria's petroleum market may no longer operate in a sustainable manner to meet the aspirations of all the key stakeholders including the Nigerian government. In its over 60 years of operation, petroleum operations have not been fully structured and developed to operate at a global standard and levels of efficiency expected of a vibrant 21st century oil and gas firm. The prevailing tax statutes and structure are out dated and not in tandem with international global practice hence the Petroleum Industry Act of 2021.

### **2.1.5 Structural Change Theory**

The theory suggests that what is needed for the transition of a nation economy from traditional economic system to a modern and developed economy is both human and physical capital accumulation and changes in the economic structure of the country (in form of tax reforms). This theory focuses on the mechanism by which less advanced economies transform their domestic economic structures from reliance on traditional subsistence agriculture to a modern and industrialized economy using various reforms including tax policy reforms. The structural change theory otherwise referred to as theory of tax structure development as advanced by Hinrichs (1966) and several others asserts that taxation is characterized at early stage of development with low tax revenue to GDP ratio, paucity of competent tax administrators, narrowness of the personal income tax base and a lot of indirect taxation on foreign trade in the tax structure. Over time, these attribute changes from stagnation to growth and effectiveness as a result government of articulated policy measures.

### **2.1.6 The Human Capital Theory**

The basis for this theory was designed by Schultz (1961), which Becker (1964) advanced through a study on economics of employers. Evidence from the study indicated that trained workers were more productive and earn more income due to advancement in knowledge and capacity. Becker (1967) divided employees into two categories that is employees with specialize human capital skills that are not transferable will have high demand; but employees with general human capital skills have less demand because employees can leave at any time if higher paying job is offered. Becker's (1967) adumbrated that investment in human capital through training, education, quality health care, veritable working condition, skilling employees in the use of modern technology and remuneration commensurate with task accomplished will results in increased productivity.

## **2.2 Laffer Theory**

This theory is a hinged on the link between public authority revenue raised through levies and tax rates. This postulation examines tax revenue raised at extreme rate of tax of zero percent (0%) and hundred percent (100%) therefore at 0% tax rate, the public authority will not earn revenue and also at 100%, the revenue authority will not earn revenue because rational tax payers have no justification to involve in production that engineer revenue inform of tax (Otemu, 2020). Consequently, the revenue raised will be 100% of no earnings. The bedrock of this theory is that an efficient rate must be determined that tax revenue will be maximized and increasing the tax rate beyond the efficient tax rate becomes counter-productive because the incentive to pay tax is impaired as a result of excessive tax burden (Otemu, 2020).

### 2.3 Empirical Review

Plethora of empirical study has link tax revenue buoyance with human capital development in Nigeria. However, Ezejiofor, et. al. (2021) carried out a study on tax revenue impact on per capital income in Nigeria with the use of ordinary least square and findings revealed that custom and excise duties have a non-significant positive effect on the gross national income. Similarly, Asaolu, et. al., (2018) employed a descriptive approach to connect revenue through tax and Nigeria economic development between 1994 to 2015. The study used an ARDL and the result revealed that an association between revenue through tax and economic.

The study of Akinbode, et. al. (2018) which is in line with examined the link between economic development and income tax using descriptive approach that covers the period of 1994 to 2015; Petroleum Profit Tax (PPT) Value Added Tax (VAT), Custom and Excise Duties (CED) and Company Income Tax (CIT), were metrics for the exogeneous variables while Economic Growth (EG), as surrogated the Gross Domestic Product, which is the endogenous variable (GDP). The result revealed that company income tax has negative connection with economic growth but VAT and CED have significant positive relationship with economic growth but Petroleum profit tax has insignificant relationship with economic growth. The above result of Akinbode et al (2018) is in line with the study of Ionkwe and Agu (2019) that covered the period between 1986 to 2016.

Efuntade, et. al. (2020) studied tax income on government spending in Nigeria and secondary data were analysed using ordinary least square to link information on government spending, PPT, VAT, CIT and PIT. The investigation revealed that revenue collected through tax significantly influences government spending in Nigeria. The study of Isaac, et. al. (2020) evaluated the impact of tax income on Nigeria's growth of its human capital and infrastructure. Secondary data on Per capita income, infrastructure development, and the human development index were used as proxy for the effects of taxes on human capital and infrastructural development in the analysis of the data using pertinent econometric tests. Based on the findings, the research came to the conclusion that taxes is a crucial part of the fiscal strategy that the Nigerian government might employ to promote economic growth. Evidentially from this study, the government should enhance the personal income tax collecting procedure so that more people may reveal their income for tax assessment, among other recommendations.

The study of Raymond and Ekponaanuadum (2021) was geared toward investigating how human capital development affects Nigeria's efforts to achieve economic growth. Ex-post facto study strategy was used since the variables Misery Index, GEH, and GEE cannot be changed because of what has already happened. It covered the period of 1981 to 2018 and error correction model with ordinary least square method was used to

make inference. Findings revealed that a long-run non-positive association exist between misery index and child teacher ratio, they recommended increase funding of human capital.

Gospel, et. al., (2022) seek to ascertain if direct taxes in Nigeria are robust and have a substantial impact on the growth of human capital. Time series data from the FIRS and the NBS covering the years 1980 to 2017 were used to complete this main goal. The ex-post facto study design was determined to be appropriate and was subsequently used since the data already exist and cannot be altered. Human development index was utilized as a stand-in for human capacity development, while petroleum profit tax buoyancy and corporate income tax buoyancy served as surrogate for direct taxes. As a result of the lower buoyancy and elasticity coefficients, the outcome demonstrates that petroleum profit and corporate income taxes are ineffective and not buoyant. Additionally, it demonstrates that there is a little but non-negative correlation between the growth of human capital and the buoyancy of the petroleum profit tax. Additionally, it is discovered that there is a positive and strong correlation between a company's income tax buoyancy and its growth of its human capital.

There have been few empirical studies performed to explore the build-ups that explain the effect of tax revenue buoyance on human capital development, resulting in a literature gap. A number of studies have also been conducted in a developed nation and a few studies have been explored in developing countries. Based on this context, the purpose of this study is to fill gaps and objectively explain the impact of tax revenue buoyance on human capital development in Nigeria throughout the period of (1970-2021).

## 2. Methodology

The sample size of the variables under study is the same as the population which implies that the sample is a census. This study census was drawn based on convenience, availability of data and it covers the period of 1970 – 2021 (52 years) derived from National Bureau of Statistics (NBS), United Nation Development Programme (UNDP) report (2022), Central Bank of Nigeria statistical bulletins (2022), world bank report (2022), NEITI report (2022), federal inland revenue service tax statistics, (2022). Descriptive statistics that tend to describe the properties or qualities of the data set employed to add value to the analysis; an augmented Dickson Fuller unit root test is carried out to determine stationarity of data predictive pattern and reliable are the estimate. The ex-post-facto research design and time series data is used for the study. Autoregressive distribution lag model will be used to determine long run co-integration and relationship among variables, the coefficient diagnostic test will also be carried out through an autoregressive distribution lag form and bound test, residual diagnostic test is used to carried out through the Breusch-Pagan-Godfrey heteroskedasticity test, unit root test is also conducted to enhance the use of the regression analysis tools used to accept or reject the null hypothesis.

### 3.1 Model Specification

The model specification for this study is expressed in econometric form which are in line with the model adopted by Osirim, et. al. (2022); Masood, et. al. (2010); Abiola, et. al. (2021) and Ogbonna and Ebimobowei (2012) with little modification as follow:

The model of Osirim, et. al., (2022) which is given below as:

$$\text{HDI} = f(\text{PPT}, \text{CIT}) \dots \dots \dots \text{..(i)}$$

$$\text{HDI} = \beta_0 + \beta_1 \text{PPT}_{\text{bt}} + \beta_2 \text{CIT}_{\text{bt}} + \text{U}_t \dots \dots \dots \text{..(ii)}$$

The a priori expectation is  $\beta_1, \beta_2 > 0$ . The greater the level of tax revenue buoyancy, the greater the human development index.



$$\text{Log (HDI)}_t = a_0 + a_1 \log (\text{PPT})_{bt} + a_2 \log (\text{CIT})_{bt} + \mu_t \dots \dots \dots (\text{iii})$$

The model of Osirim, et. al.,(2022) which has been modified for this study suggests that specific adjustments are finally reflected in the macroeconomic data and this will enhance comparison and consistency within the study census. Consequently, the model for the study is stated below;

This has been modified as:

$$\text{HDI} = F(\text{PPTB}, \text{CITB}, \text{EGR})$$

$$\text{HDI} = \text{PPTB}_t + a_2 \text{CITB}_t + a_3 \text{EGR}_t + \mu_t - eq1$$

Where: F=functional Notations

HDI = Human Capital Index (Dependent Variable)

PPTB= Petroleum Profit Tax Buoyance expressed as  $\Delta \text{PPT} / \Delta \text{GDP} \times \text{GDP} / \text{PPT}$  (Independent Variable)

CITB= Company Income Tax Buoyance expressed as  $\Delta \text{CIT} / \Delta \text{GDP} \times \text{GDP} / \text{CIT}$  (Independent Variable)

PPT= Petroleum Profit Tax

CIT= Company Income TAX

EGR= Economic Growth Rate (Control Variable)

$U_t$  = Error Terms;  $t$  = time  $t$  (1970-2021);  $a_0, a_1, a_2, a_3$  =Regressors.

The definition of tax buoyance is based on the study of Abiola, et. al.,(2021) where it was expressed as  $\Delta T_t / \Delta Y \times Y / T_t$  and for any given tax type by  $\Delta T_k / \Delta Y \times Y / T_k$  where.  $\Delta T_t$  = change in tax type,  $\Delta Y$ = change in gross domestic product,  $Y$ = gross domestic product,  $T_k$ = tax type. The study also emphasized that tax buoyance greater than 1 is very highly effective and tax buoyance less than 1 is lowly effective.

However, in order to establish a long-run relationship and co-integration between tax buoyance element, and human capital development when the dependent variable is a function of its own past lagged value as well as current and past values of other explanatory variables (Abiola, et al., 2021) and when mixed level of stationarity exist among the independent variables (Otemu, 2020). The autoregressive distribution lag model is for such estimation and the model is given below:

$$\text{HDI} = C(1) * \text{HDI}(-1) + C(2) * \text{HDI}(-2) + C(3) * \text{PPTB} + C(4) * \text{CITB} + C(5) * \text{EGR} + C(6)$$

Where: C(1) to C(6) = Regressors and -1 to -2= time lag 1 to time lag 2

**Table 1: Variable Measurement and Source**

Variables	Definition	Type	Measurement	Source
HDI	Human Capital Development	Dependent	Calculated by Human Development Index.	Osirim, Wadike and Gospel (2022)
PPTB	Petroleum profit Tax Buoyance	Independent	Calculated as the (change in the petroleum Profit tax in time lag $t$ divided by change in gross domestic products in time lag $t$ ) multiplied by (gross domestic product in time $t$ divided by petroleum profit tax in time $t$ ).	Abiola, Afolabi and Yahaya (2021)

CITB	Company Income Tax Independent Buoyance	Calculated as the (change in the company income tax in time lag t divided by change in gross domestic products in time lag t) multiplied by (gross domestic product in time t divided by company income tax in time t).	Abiola, Afolabi and Yahaya (2021);
EGTH	Economic growth Rate Control Variable	Measured as economic growth rate values	Raymond and Ekponaanuadum, (2021)

**Source: Authors' Compilation (2023)**

### 3. Data Analysis and Discussion of Findings

#### 4.1 Descriptive Statistics

The characterization of variables is expressed in Table 2

**Table 2: Descriptive Statistics**

	HDI	PPTB	CITB	EGR
Mean	0.431269	-0.008454	0.017390	0.038252
Median	0.405500	0.046312	0.015423	0.042150
Maximum	0.724000	1.131116	0.123112	0.250100
Minimum	0.299000	-4.023262	-0.07804	-0.1313
Std. Dev.	0.075497	0.701559	0.032963	0.062836
Skewness	1.242893	-3.767082	0.556330	0.142903
Kurtosis	5.540841	22.33116	5.755340	5.179516
Jarque-Bera	27.37583	932.6573	19.13147	10.46928
Probability	0.000001	0.000000	0.000070	0.005329
Sum	22.42600	-0.439609	0.904288	1.989100
Sum Sq. Dev.	0.290690	25.10140	0.055413	0.201366
Observations	52	52	52	52

**Source: Authors' Computation (2023)**

The mean and median value of the HDI at 0.431269 and 0.4055 respectively shows that Nigeria is rank among lowly ranked country in terms of human capital development which has been affirmed in the human development report. The mean value of PPTB of -0.008454 and CITB of 0.01739 shows that they were buoyancy of these revenue sources are lowly buoyant. The kurtosis that measures the peakedness or tailedness of a distribution; the kurtosis value of PPTB and CITB with kurtosis value of 22.33 and 5.755 respectively which are leptokurtic because their value is greater than 3.

#### 3.2 Unit Root Test

Table 3 contains the estimate of unit root test at no difference. The individual unit



root test of stationarity which indicate how stationary is the data set to enhance prediction. When a time series data is stationary, it indicates that such data set has a constant mean, a constant variance and a constant auto correlation with time. If the P-value is below the critical value it implies stationarity or rejection of the null hypothesis.

**Table 3: Unit Root Test for Variables at Levels**

Method	Statistic	Prob.**		
ADF - Fisher Chi-square	101.226	0.0000		
ADF - Choi Z-stat	-6.28171	0.0000		
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				
Intermediate ADF test results UNTITLED				
Series	Prob.	Lag	Max Lag	Obs
HDI	0.0000	1	10	50
PPTB	0.0000	0	10	51
CITB	0.0000	0	10	51
EGR	0.239	0	10	51

**Source: Authors' Computation (2023)**

Since PPTB at 0.0000, CITB at 0.0000 are less than 0.05 critical value therefore petroleum profit tax buoyance, company income tax buoyance are stationary and can enhance prediction of human capital development at no difference. However, the control variable of economic growth rate has a P-value of 0.239 indicating that it will not enhance prediction in the long run. Due to this an auto regression distribution lag analysis form and bound test on co integration and relationship will be used to establish a long run pattern of independent variable on the dependent variable which will also correct this feature created by the control variable though the control variable will not affect the other variables long run predictive prowess because at first difference all the variables become stationary.

#### 4.2.1 Unit Root Test at 1<sup>st</sup> difference Result

This is required to ensure that all the independent variables and control variables are stationary to ensure that ordinary least square method can be used to accept or reject the hypothesis based on the P-value criteria. The following estimates were derived.

**Table 4: Estimation of variables**

Method	Statistic	Prob.**		
ADF - Fisher Chi-square	176.698	0.0000		
ADF - Choi Z-stat	-12.4183	0.0000		
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				
Intermediate ADF test results D(UNTITLED)				
Series	Prob.	Lag	Max Lag	Obs
D(HDI)	0.0000	0	10	50
D(PPTB)	0.0000	1	10	49
D(CITB)	0.0000	2	10	48
D(EGR)	0.0000	0	10	50

**Source: Authors' Computation (2023)**

At first difference the explanatory variables of petroleum profit tax buoyance,

company income tax buoyance and control variable of economic growth rate showed an Augmented Dickson Fuller score of 0.0000, 0.0000 and 0.0000 respectively which are less than the P-value at 0.05 indicating that stationarity exist and no unit root that is the independent variable explanation of the dependent variable can be relied on.

#### 4.3 Correlation Matrix

Pearson product moment correlation analysis is used to examine the relationship between variables. The results of the analysis are shown in Table 5.

**Table 5: Correlation Matrix**

Correlation	HDI	PPTB	CITB	EGR
HDI	0.00559 1			
PPTB	-0.00714 -0.13745	0.482719 1		
CITB	0.000514 0.21064	-0.00552 -0.2435	0.001066 1	
EGR	-0.00056 -0.11931	-0.003 -0.06928	-0.00043 -0.21278	0.003872 1

**Source: Authors' Computation (2023)**

The analysis of the relationship between variables is depicted in table 5 above. Evidence from the shows that the coefficient of correlation value of 1 is obtainable between a variable and itself. This is an indication of a perfect correlation between the variable and itself. The result of the coefficient of correlation shows a mixed of positive and negative correlation. The explanatory variable of petroleum profit tax buoyance (PPTB) has a negative correlation while the explanatory variable of company income tax buoyance is positive. The coefficient is however is not problematic since it is less than the 0.80 benchmark and not indicative of any problem of multicollinearity. The above result in table shows that multicollinearity does not exist and it is further given credence by the result of the unit root test at the difference level as shown above. The statistical implication of this is that, all the variables had a significant relationship with human capital development (HDI) since it had p-values > 0.05.

#### 4.4 Tax Revenue Buoyance and Human Capital Development in Nigeria

This is used to predict the behaviour of the endogenous variables which indicate the line of best fit that enhances prediction with significant accuracy. The null hypothesis is rejected if the P-value is less than the level of significance of 5%.

**Table 6: Estimation of Tax Revenue Buoyance and Human Capital Development**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HDI(-1)	-0.08641	0.151128	-0.57178	0.5704
HDI(-2)	1.178098	0.17999	6.54535	0.0000
PPTB	-0.0011	0.005672	-0.19461	0.8466

CITB	0.169531	0.12344	1.373393	0.0369
EGR	-0.08246	0.07225	-1.14137	0.2599
C	-0.01987	0.028337	-0.70115	0.4869
R-squared	0.882679	Mean dependent var		0.43592
Adjusted R-squared	0.869347	S.D. dependent var		0.073131
S.E. of regression	0.026434	Akaike info criterion		-4.31617
Sum squared resid	0.030745	Schwarz criterion		-4.08673
Log likelihood	113.9043	Hannan-Quinn criter.		-4.2288
F-statistic	66.20798	Durbin-Watson stat		1.998851
Prob(F-statistic)	0			

**Source: Authors' Computation (2023)**

The Durbin-Watson statistics of 1.998851 which is lower than 2.5 shows that the auto-correlation is within the normal region which enhances co-integration and relationship between the dependent and exogeneous variable. The log likelihood that measures the goods of fit of the model with a value of 113.9043 which is high indicate that the autoregressive distribution model is good model that will enhance co-integration and relationship in the long run. Since ARDL represent the process where the endogenous variable is a function of its own past lagged value as well as current and past values of other independent variables. Therefore, if the P-value is less than the critical value of 0.05 level of significance; reject the null hypothesis and accept the alternative hypothesis. More so, HDI has positive association and a significant impact on itself at time lag 2 with coefficient value of 1.178098 and P-values of 0.0000. PPTB shows a negative association and an insignificant impact on human capital development with a coefficient of -0.001104 and P-value of 0.8466. The Company income tax buoyance has a positive association and a significant impact on human capital development with coefficient value of 0.169531 and P-value of 0.0369.

The R-Square value of 0.882679 shows that the independent variables (petroleum profit tax buoyance and company income tax buoyance) and control variables of economic growth rate jointly explain 88.26% of the systematic variation in the dependent variable human capital development (HDI). Based on the fact the model is statistically significance, that is the F-statistic of 88.20798 is above the value of 5 bench mark and P-value at 0.000000 is significant at  $P < 0.05$ ; this indicates that there is a significant statistical relationship between the independent variables and the endogenous variable.

#### 4.5 Auto-Regression Distribution Lag Form and Bound Test Result

The coefficient diagnostic test that determines the bases of accepting or rejecting the null hypothesis by aiding in determining the long run co-integration or relationship that exist between the dependent and independent variables. The estimates are shown below:

**Table 7: Estimation of variables**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.01987	0.028337	-0.70115	0.4869
HDI(-1)*	0.091686	0.065543	1.398874	0.1689
PPTB**	-0.0011	0.005672	-0.19461	0.8466
CITB**	0.169531	0.12344	1.373393	0.0369

EGR**	-0.08246	0.07225	-1.14137	0.2599
D(HDI(-1))	-1.1781	0.17999	-6.54535	0.0000
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as $Z = Z(-1) + D(Z)$ .				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PPTB	0.01204	0.064392	0.186976	0.8525
CITB	1.84903	2.10496	0.878416	0.3845
EGR	0.899408	1.001189	0.89834	0.3739
C	0.216703	0.159372	1.359729	0.1808
EC = HDI - (0.0120*PPTB + 1.8490*CITB + 0.8994*EGR + 0.2167 )				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	3.273051	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	50	Finite Sample: n=50		
		10%	2.538	3.398
		5%	3.048	4.002
		1%	4.188	5.328

**Source: Authors' Computation (2023).**

The ARDL F-bound test helps to ascertain if a long run co-integration and relationship exist between the endogenous and independent variables at lower bound I(0) or upper bound I(1). If the F-statistic is greater than the lower or higher bound values the null hypothesis is rejected and the alternative accepted. Since the F-statistic value 3.273051 greater than 2.538 at 10% level of significance; 3.048 at 5% level significance at lower bound I(0) at finite sample of 50 indicating the rejection of the null hypothesis and acceptance of the alternative that tax buoyance has a long run relationship and co-integration with the development of human capital in Nigeria. Furthermore, the F-statistic value 3.273051 is greater than 3.2 at 10% level of significance at higher bound I(1) at finite sample of 1000 indicate the rejection of the null hypothesis and acceptance of the alternative that tax buoyance has a long run relationship and co-integration with human capital development in Nigeria.

#### 4.6 Discussion of Findings

The findings will be highlighted based on empirical statistical deductions which is cantered on the decision rule of rejecting the null hypothesis and accepting the alternative if the probability value is less than 0.05 or accepting the null and rejecting the alternative if the probability value is greater than 0.05. The result in Table 6 shows that petroleum profit tax buoyance has a negative association and insignificantly impacts human capital development in Nigeria. This is in line with the assertion of Akinbode, et. al., (2018). The mean value of -

0.008454 shows that petroleum profit tax buoyance is lowly buoyant with regards to enhancing tax revenue in Nigeria. This implies that the reforms in the petroleum industry like petroleum industry Act of 2021, Finance act 2021 and other innovation within the petroleum industry need to be vehemently administered by re-examining areas of weakness with respect to oil theft and leakages that is emphasized in the NEITI report (2022), has contributed to its volume of tax inflow.

Table 6 also shows that company income tax buoyance has a positive and significant impact on human capital development in Nigeria at a coefficient value of 0.169531 and P-value of 0.0369 indicating that the null hypothesis 2 should be rejected. This result supports the stands of Osirim, et al., (2022). It also shows that the reforms in the Finance Act 2021 and other prior reforms in company income tax Act are providing the required tax revenue to impact human capital development in Nigeria in respect to education, life expectancy and standard of living. This also implies that tax authority could execute tax rate reduction processes to encourage more firms to remit taxes thereby increasing the tax base. The mean value of 0.01739 for CITB signifies that a 1% change in gross domestic product is caused by a less than 1% change in company income tax revenue.

The auto regression distribution lag result showed that after 2 lags in which the dependent variables influence the result by being independent over the two lags. The impact human capital development is significant and shows a positive association in the long run with P-value of 0.0000 and coefficient of 1.178098 as shown in table 6 which allows the model to predict normally in the long run and co-integrate. Flowing from the broad objective of this study, which is to examine tax revenue buoyance and human capital development in Nigeria, empirical analyses have been conducted and discussion on findings offered. Evidentially from the result of our in-depth investigation, the study revealed that petroleum profit tax buoyance (PPTB) had a negative and statistically insignificant relationship with human capital development (HDI) in Nigeria; company income tax buoyance (CITB) had a positive and statistically significant relationship with human capital development (HDI) in Nigeria; and human capital development in time lag 2 had a positive and statistically significant relationship with human capital development (HDI) in Nigeria.

#### **4. Conclusion and Recommendation**

The burning question of the factors that influence human capital development has continued to be a puzzle in country like Nigeria that has the population, the natural resources, the human capital, the social capital, physical capital and the environmental capital that steer tax revenue but it is still classified as a country that is under developed, multi dimensionally poor and has serious revenue deficit due to poor tax administration and accountability of revenue usage. This current study questioned whether tax revenue buoyance impact human capital development in Nigeria. Since Gospel, et.al. (2022) study shows that petroleum profit tax buoyance does not impact human capital development and company income tax buoyance impact human capital development and Isaac, et. al., (2020) in their study concluded that taxes affect human capital development in Nigeria; therefore, the position in literature is still not certain and this tends to close some of this gap.

This study reviewed the issue of tax revenue buoyance in terms of the administrative prowess, tax structure, tax net, tax base, taxable firms' classification, technology payment gateway, tax legal resolution which is proxy by the change in revenue generated through petroleum profit tax, company income tax, value added tax and custom excise duties and how it impacts the human development factors like education, life expectancy and standard of living. The independent and control variables data collected

were gathered from the central bank of Nigeria statistical bulletin, National Bureau of Statistics data gateway, Federal Inland Revenue Service statistics for 52 years dated 1970 to 2021 and human development index report which surrogated human capital development were gathered from UNDP report (2021). The choice of the long period of time was made to have a clear understanding of the trend over the years, of the influence of the selected variables on Human Capital development. The study employed an auto regression distribution lag approach to estimate variables which enhances long run relation and co-integration between the endogenous variable and the exogeneous variables. The individual P-values of the independent variables were used to make statistical inference on accepting or rejecting the null hypothesis.

Deducing from the evidential analytics and finding of this study, the following recommendation are made: Frantic effort should be made deliberately in the area of tax education in Nigeria through sensitization programs on the need to pay tax and the necessary benefit for such remittance; Deliberate policies on upstream petroleum revenues collections and administration should be made transparent to stakeholders to engender accountability in Nigeria; The issue of oil theft should be dealt with by using legislation and culprit in this act should be prosecuted as act of financial crimes. This will enhance transparency and reduce revenue leakages in Nigeria; The use of information technology in tax assessment, remittance and filling is a welcome development but the system can also be expanded to enhance compliance and any defaulting firm in Nigeria can be either be restrained through account confiscation or summons.

The methodology of auto regression distribution lag shows the influence of human development on its self over two lags therefore the need to invest in the human capacity is highly required in Nigeria. Conscious investment like; increased budget allocations to health care, education and cost reduction mechanism on productive patterns will enhance human capital which will incrementally afloat tax revenue opportunities; The tax managers in Nigeria should ensure that tax evading organization are timely prosecuted through the tribunal and all effort should be made to reduce the level of tax avoidance; The tax rate restructuring in Nigeria through the Finance Act (2021) is a step in the right direction but multiple tax to different revenue collecting agencies result in administrative inconsistencies and huge tax burden. Therefore, the tax revenue collecting agencies should consolidate all tax revenue into a single rate payable at a specified time interval; and the paradigm shift from the ordinary least square analysis to auto regression distribution lag approach has created inferential basis for decisions; therefore, researchers can expand this model by increasing the number of dependent lags or regressing lags to predict the when desired objectives can be attained.

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