

## Tax incentives and industrial/economic growth of sub-Saharan African States

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Trimisiu Tunji Siyanbola <sup>1,\*</sup>, Samuel Babatunji Adedeji <sup>2</sup>, Folajimi Festus Adegbie <sup>3</sup>,  
Mohammad Mizanur Rahman <sup>4</sup>

<sup>1</sup> Department of Accounting, Babcock University, Ilishan Remo, Ogun State, Nigeria

<sup>2</sup> Department of Accounting and Finance, Faculty of Economics and Management, Universiti Putra Malaysia, Malaysia

<sup>3</sup> Department of Accounting, Babcock University, Ilishan Remo, Ogun State, Nigeria

<sup>4</sup> Department of Management and Marketing, Faculty of Economics and Management, Universiti Putra Malaysia, Malaysia

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### ABSTRACT

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This study investigated the impact of tax incentives on industrial growth of Sub-Sahara African States using Nigeria and Ghana as case studies. Data were obtained from World Bank Data Index (WDI), Federal Inland Revenue Services (FIRS), Ghana Revenue Authority (GRA), Nigerian Investment Promotion Commission (NIPC), Ghana Investment Promotion Centre (GIPC) and Action-aid International (AAI) for 4-year period between 2011 and 2014. A linear model of Tax Revenue, Tax Incentives and Economic Growth, proxied by GDP, was estimated using the Ordinary Least Square technique. The result indicated a 0.529:1 relationship between tax incentives and GDP, which show that Africa is not doing much at the moment to encourage productivity. The result, amongst others, indicate positive effect of tax incentives on industrial and economic growth, suggesting that increasing tax incentives to productive and priority sectors of African economy will increase the continent's gross domestic products. It was therefore recommended that Sub-Sahara African States should grant more incentives to those sectors and monitor closely the administration of such incentives through special parastatals so as to generating relevant financial data of the actual amount of incentives relative to the economic growth regularly to evaluate the efficiency of tax incentives in the economy.

#### Keywords:

Economic growth, fiscal policy, industrial growth, revenue, tax and tax incentives

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## 1. Introduction

Virtually all countries in the world strive to increase their revenue base so as to improve their economy as represented by the growth in their Gross Domestic Products (GDP). One of the ways by which revenues are generated is through taxation which is normally enhanced by introduction of various incentives to motivate the citizens to willingly pay as at when due. These incentives normally come in form of tax reductions in the hand of the payers, with a view to inducing investments in the sector of the economy where such incentive is introduced by the government. To this end,

\* Corresponding author.

E-mail address: [shiyabolatunji@yahoo.com](mailto:shiyabolatunji@yahoo.com) (Trimisiu Tunji Siyanbola)

government normally use incentives to stimulate investment into the priority sectors they want to focus in a particular financial year. This is why incentives are introduced as part of the fiscal policies of the government in support of the budget for the period. Experts have found the necessity to raise tax revenue via expansion of tax incentives as alternative to financing budget deficits in place of external borrowing to finance the deficits. According to Oriakhi and Osemwengie [1] about 70% of sub-Saharan African countries are presently experiencing huge budget deficits due to their inability to raise the required revenue for the execution of the budget. This is what makes the western nations to be more developed than countries in the region.

Oriakhi and Osemwengie [1] state that tax incentive was first introduced in Nigeria for industrial development in 1958 and this was in form of pioneer companies' relief (5 years tax freedom for the companies designed as pioneer); capital allowances extended to companies on their investments in machinery, building and loss relieve; import duties concessions were also granted to selected pioneer companies on imported inputs. Kuewumi [2] traced the history of tax incentives in the US to the time of President Hoover in 1920s, when tax rates were slashed 5 times to raise the number of effective tax payers and tripled tax receipts. Tax incentive regime in Ghana is governed by 1992 Constitution as well as other fiscal policies, with the aim of stimulating production at reduced costs, amongst others. The history of tax incentive in the UK is not different from the other countries as incentives were given in form of tax credit and this has tremendously improved the economy of Great Britain.

Various authors have explained the reasons for granting tax incentives but the one that is more elaborate is that of Philip [3]. According to him, tax incentives are deliberate reductions in tax liability granted by government in order to encourage particular economic units to act in some desirable ways. To him the incentives would motivate the beneficiary to either invest more, produce more, employ more, export more, save more, conserve less, or even pollute less. All these adjectives point to the fact that the incentive would lead to higher investment in the country once the beneficiary invests more. It will also lead to high production, thus increasing the Gross Domestic Products of the nation. The company will be able to employ more, thus helping the government of the day to fulfil their political objective of providing full employment to the populace. Export will improve, thereby reducing importation to only essential goods that are not available locally, and therefore reduce pressure on foreign exchange. Save more for the raining days, thereby increasing the external reserve of the nation. Conserve less, thereby increase the output. Pollute less, thereby improving the environment and become good corporate citizen. All these qualities are traceable to tax incentives to corporate bodies as distinct from those available to individual hence the definition is perfect for industrial growth of the economy.

Growth of a nation's economy can be measured by the level of its Gross Domestic Products. In this study, we relate the growth of the economy of Nigeria and Ghana (as examples from sub-Sahara African countries) for 4 years from 2011 to 2014. The choice of the countries is motivated by their level of popularity within their respective blocs. Thus, the objective of this paper is to investigate the impact of tax incentives on economic and industrial growth of sub-Sahara African states (Nigeria and Ghana). This is done through modelling using data obtained from the World Bank and Action-aid International.

## **2. Literature Review**

The literature review part has been discussed as follows under the conceptual & theoretical reviews, tax incentives in relation to Nigeria and Ghana and empirical review.

## 2.1 Conceptual and Theoretical Review

**Fiscal Policy:** Ishola [4] describes fiscal policy as a measure or various measures designed to regulate, coordinate and control government revenue and expenditure with a view to achieving price stability, full employment and income redistribution. Three key elements of effective fiscal measurements are revenue generation, through tax collection; government expenditure, also known as public expenditure and debt management. While tax collection is to increase the quantum of revenue to the government, public expenditures are necessary to improve the level of income, consumption, outputs and employment propensity in the country. Debt management can also be used to influence the level of income, consumption, output and employment. The latter can also be used to control the level of money supply in the economy hence a good balance must be struck between taxation and government expenditure so as not to destabilize the economy. In managing the resources of a nation, both monetary and fiscal policies are very important and it is noticeable that the world economy has been very volatile in recent time. CBN [5] attests to the overall dwindling economic growth in the world when they reported that World Bank has been cautious in retaining the global output growth projection of 2.4% in its June 2016 report. This was attributed to weak trade and financial conditions. The OECD' Economic forecast in September 2016 also emphasized the current low-growth trap facing the world economy.

**Tax:** Akanle [6] defined tax as a compulsory levy imposed on a subject or upon his property by the government having authority over him. This definition reflects the fact that tax is compulsorily imposed on person, including corporate bodies, by government, be it federal, state or local government, as they all have authority over the citizens residing within the locality of their respective jurisdictions. This definition was expanded by the current National Policy on Taxation, where taxation was defined as any compulsory payment to government imposed by law without direct benefit or return of value or a service whether it is called a tax or not. The latter definition confirms the fact that compulsory payment of tax to government coffers does not confer any direct obligation on the government to the individual who pays it. You are to pay it without expecting any direct benefit in returns. But in trying to differentiate between tax and taxation, Somorin [7], by analogue states that "people generally say "I haven't paid my tax this year". I am yet to come across a tax payer that said "I haven't paid my taxation this year". From that simple example we can easily conclude that we can use the two words interchangeably, depending on the context by which we are referring to the same thing. Tax is a noun, while taxation is an adverb. That is just the thin line of difference between the two. As important as tax is, of all the fiscal policy elements, tax seems to be the major source of state revenue, mostly found in use to fund government businesses and other developmental programmes [8].

**Revenue:** IAS 18 [9] defines revenue as 'the gross inflow of economic benefits during the period in the course of ordinary activities of an entity, when those inflows result in increases in equity, other than increases relating to contributions from equity participants'. This points to the fact that revenues only accrue when inflows lead to increment in the equity of a firm, this is viewing revenue in economic terms, but if we are looking at revenue due to the public sector and one of the means of collecting it is through taxation. Tax revenue according to Ebeke and Ehrhart [10] are all forms of revenues collected through taxes on income and profits, social security contributions, those levied on goods and services, payroll taxes, taxes on ownership and transfer of properties and others not specifically mentioned. A way of measuring the degree by which the government of a nation controls the economy's resources is by determining the percentage of total tax revenue on its GDP. This study used this measure greatly to show the impact of incentives on economic and industrial growth of the case studies over the years under consideration.

*Industrial Growth:* Chete *et al.* [11] classified industrial sector in Nigeria into manufacturing, mining and utilities. To them, this constitutes a tiny proportion of the economy, in all 6% (4% for manufacturing and 2% for the others) based on 2011 GDP. Reasons adduced for this tiny proportion range from power outage, high crime rates, corruptions and transportation problems. The sectors face inadequate power supply, hence resorting to the use of generators to power their machines, with a huge sum of money spent to maintain the generators in term of fuelling, thus increasing the cost of production, thereby eroding their profit margin and competitiveness in the global market. Manufacturers were induced to fly to neighbouring countries such as Ghana and Benin Republic, where there are adequate infrastructures, aside from better tax incentives that made their cost of doing business relatively cheaper than is the case with Nigeria. Conclusively, industrial growths are only possible when there is adequate infrastructure to stimulate production. This makes the difference between developed and developing countries. To stimulate industrial growth, pioneer status is granted to certain companies under Industrial Development Income Tax Relief Act 1971 (CAP 179, LFN, [12]). The Act provides incentives by exempting all companies enjoying pioneer status from paying tax for the period of 5 years of commencing business, other incentives are also granted to the companies under this category.

*Economic Growth:* economic growth is a sustained increase in a country's real GNP and per capital real GNP. Adebayo [13] stated that economic growth occurs if a rise in a nation's productive capacity, sustained over a long period, leads to a greater output of goods and services in the economy as a whole, to the extent that more goods and services are available for each person on the average. The definition restricts economic growth to GNP, which refers to gross earnings (incomes) retained in the country and earned from abroad, excluding income transferred abroad, whereas GDP is the market value of all final goods and services produced within a country in a year [14]. Our own definition of economic growth will be premised on GDP. This definition is motivated by the fact that tax incentive is given by the government to increase the productive capacity of the nations in full without any discrimination. Therefore, productivity, which accounts for the economic growth of a nation, is measured by the size of the gross domestic products (GDP) of that nation.

*Tax Incentives:* Tax incentives are designed to encourage investments in priority sectors of the economy. According to Somorin [7], tax incentives in Nigeria are in form of tax holidays, tax cuts, reliefs and allowances, credits and exemptions. Tax incentives are directed at attracting inflow of foreign earnings to complement domestic suppliers to grow the economy. Such sectors of the economy where incentives are normally granted are the manufacturing, agriculture, solid minerals and export promotion. Individuals also derive tax incentive from government. Relevant incentives for industrial promotions include: capital allowance, investment allowance, annual allowance, loss relief, pioneer company relief, export processing zone relief and others. According to Uwaoma and Odu [15], the incentives act like a catalyst to industrial development through reduction of the import content of domestic production, thereby improving balance of payment and enhance impact of industrialisation on income and employment within the nation. For the case studies, an array of tax incentives granted to stimulate the industrial sectors abound in all of them, few of which are hereby restated in this study. In Nigeria virtually all the tax laws have provisions for tax incentives, specifically CITA grants various incentives to manufacturing companies. According to Mensah [16], tax incentives in Ghana had been categorised under allowances, credits, preferential tax rates, tax deferrals and tax holidays. Incentives are recognised as government expenditure in Ghana, therefore tax incentive is synonymous to Tax expenditure in Ghana. This is well covered by the country's constitution of 1992. To avoid leakages in Government Revenue, through reckless granting of tax incentives in the name of tax expenditure, a special committee is normally charged with the responsibility of monitoring the expenditure in Ghana. According to Mensah, these incentives aim at encouraging manufacturing by

reducing cost of production through carrying forward of losses, import duties and others. The impact of this has improved the GDP of Ghana over the years. Summary of corporate tax incentives in Ghana, (GIPC [17] and NIPC [18]) are also included in the next section.

Several theories underpin the study of taxation as a discipline, only few can be directly traced to tax incentives, specifically Laffer curve theory is the most appropriate to this study. We therefore anchor this study on the theory. For economic and industrial growth theory we reviewed the three main schools of thought on economic growth, namely: classical, neo-classical and endogenous theories.

*Laffer curve Theory:* This theory originates from an economist, Arthur B. Laffer, whose work had its root from Ibn Khaldun and John Keynes [19]. The work of Khaldun, the Muqaddimah, reveals that tax yields higher revenue from small assessments but smaller revenue from large assessment, while Keynes posits that higher taxation defeats its object but a reduction of taxation stands a better chance than an increased balanced budget [20]. The curve propounded by Laffer presumes that revenue from taxation will change in response to changes in tax rate or what we can call tax revenue elasticity. The higher the tax rate, the lower the tax revenue and vice versa. All these statements (Khaldun's, Keynes' and Laffer's) boil down to tax incentives to encourage people to pay tax. The assumption in Laffer's theory is that change in tax rates have two effects on tax revenue. These are arithmetic and economic effects. The arithmetic effect presumes direct relationship between tax rate reduction and tax revenues, that is the lower the tax rate the lower the tax revenue accruing to the government and vice versa. The economic effect can be likened to the ratchet effects as lowering tax rate would translate to increased output and productivity of employees, while increased tax rate would make employees to exhibit ratchet behaviour by not performing to the optimal level. In effect, lowering tax rates is an incentive to increase activities as well as the tax base and vice versa. Once enough tax incentives are given to tax payers, there is every tendency that they would always want to comply with tax laws and be eager to pay the amount of tax due from them as captured by Alm [21], tax compliance includes voluntary reporting of all incomes and paying all taxes in line with applicable laws and regulations.

*Classical Theory:* Originator of classical economics Adam Smith [22] focused economic freedom where laissez-faire and free competition rules the nation. A better alternative theory, comparative advantage, was developed by Ricardo (1772-1823). This was premised on the fact that the value of goods produced and sold under competitive condition tends to be proportionate to the labour input engaged in producing them. Harrod [23] and Domar [24] tagged as Harrod-Domar (H-D) Model provides a more linear form of growth of saving and capital formation. Here economic growth was approached from different perspectives but arrived at the same conclusion that investment is critical to economic growth, they distinguished between the demand pull and supply pull of investment. To them, demand effect creates income while supply effect translates to the productive capacity of the economy. This theory was criticised for its assumption of the equal use of labour and capital in production, given birth to neo-classical movement of the 1950s.

*Neo-classical theory:* Solow [25] and Swan [26] prefer a growth model where capital output ratio,  $v$ , was regarded as the adjusting variable leading the system back to steady growth path, as better alternative to Harrod Domar model. The model tries to correct the defect of short term mentality in Harrod Domar model and therefore built in a long run growth variable into the H-D model through the inclusion of labour as a factor of production, they relaxed the fixed proportions in production as well as the substitutability between capital and labour. The relationship is given in form of production function:  $Y = f(K, L)$  where  $Y$  is the output;  $K$  is the capital and  $L$  is the labour input.

*New Growth (endogenous) theories:* These theories argued that investment in human capital, innovation and knowledge has positive effect on economic growth of a nation [27]. This movement

focus on externalities and the spill over effects of a knowledge based economy as a precursor for economic developments. The leader of this endogenous growth movement, Arrow [28] premised his study on the economic implications of learning by doing, an extension of this study was conducted by Levhari and Sheshinski [29]. Different variants of this model were given by Romer [27] and Lucas [30]. Romer's model of technical change is based on the fact that human capital, along with the available stock of knowledge, leads to production of new knowledge. As far as he is concerned, growth is driven by technological change as well as capital accumulation that arises from intentional investment decisions made by profit-maximising agents (industrial sectors). Onakoya [31] opined that the stock of human capital determines the rate of growth but a large population is not sufficient to generate growth.

## *2.2 Tax Incentives in Nigeria*

CBN [5] identified the framework for implementing fiscal incentives to be vested with the different organisations with specific roles as follows: Nigerian Investment Promotion Council (acts as front office and coordinator of all other agencies in promoting fiscal incentives); Corporate Affairs Commission (charged with the incorporation of companies); Nigeria Immigration Service (grants work permits and visa); Nigeria Custom Service (in charge of import and export guidelines as well as tariff information); Federal Inland Revenue Service (in charge of tax collections and all matters relating to taxation); National Office for Technology Acquisition and Promotion (in charge of technology transfer); National Agency for Food and Drug Administration and Control (regulates foods and drugs); Standards Organisation of Nigeria (ensures product conformity); Federal Ministry of Solid Minerals Development (the ministry in charge of mining license); Federal Ministry of Foreign Affairs (they conduct due diligence on foreign companies and other related issues); Federal Ministry of Interior (they facilitate business permits and expatriate quotas); Nigerian Electricity Regulatory Commission (they are repository of information relating to electricity industry); Nigeria Export Promotion Council (facilitates export trade); Nigeria Maritime Administration and Safety Agency (they keep information about maritime industry); National Planning Commission (keeps information about macroeconomic indicators, government policy trust and priority sectors) ; Department of Petroleum Resources (in charge of all information relating to oil and gas investment opportunities); Nigeria Copyright Commission (keeps information on copyright industry); Manufacturers Association of Nigeria (in charge of all information relating to investment opportunities in manufacturing industry); Pharmacist Council of Nigeria (in charge of information relating to health sector investment opportunities); National Bureau of Statistics (keeps statistics on Nigerian economy); Ministry of Federal Capital Territory (every investment opportunity in the Federal Capital Territory); Federal Ministry of Finance (issues relating to fiscal policies are obtainable from this ministry); Central Bank of Nigeria (issues relating to monetary policies); Oduá Investment Company (issues relating to the promotion of investment opportunities in the south west region of the country); South east/South-south desk (issues relating to the promotion of investment opportunities in the south east and south-south region of the country) and New Nigeria Development Company (promotion of investment opportunities in the northern region of Nigeria). Even though the country parades these array of regulatory bodies, fiscal policies continue to be undermined as incentives granted manufacturing sectors have not impacted positively on the cost and standard of living of the citizens. This negative impact was adduced to weak institutions, weak macroeconomic environment, poor infrastructural facilities, inadequate policy monitoring and evaluation, poor regulatory/supervisory framework, corruption, country risk and unfavourable political climate by CBN [5]. This view align with the finding of Well and Allen [32] when they conclude that in spite of the fact that fiscal investment incentives

are popular in developing countries, they have not, in anyway been effective in making up for fundamental weaknesses in the investment climate.

### 2.3 Tax havens in Ghana

According to Mensah [16], the analysis of tax incentives regime between 2008 and 2013 reveals increase in tax incentive in form of tax expenditure ranging between 14.18% to 41.20% in relation to tax revenue and tax expenditure of between 1.80% to 5.31% in relation to GDP. The highest incentive of 41.20% that was given in 2010 boasted the economy of the country, which had negative effect on neighbouring countries economy, including Nigeria, as there were exodus of movements to Ghana by manufacturing companies. Evidence abound in such companies as Michelin Tyre, Dunlop Tyre, Textiles and cement companies. Most of these companies operate within Ikeja Industrial city in Lagos Nigeria in the 1980s and early 2000s and only moved to Ghana when the cost of doing business, through epileptic power supplies and other infrastructural decays, coupled with various incentives available in Ghana.

### 2.4 Arrays of Tax Incentives to stimulate Industrial growth in Nigeria and Ghana

Below contains summary of some of the tax incentives granted to stimulate industrial and economic growth in Nigeria and Ghana:

**Table 1**

Tax Incentives in Nigeria and Ghana

S/N	Nature of Incentive	Nigeria	Ghana
1	Interest exempted	Interest payable on loan granted by banks on or after April 1 1980	Deductibility of financial cost other than interest for a year of assessment is limited to: (i) financial gain included in income of the person from business or investment and (ii) 50% of income from business and investment excluding financial gain or cost deducted. Any excess can be carried forward during the subsequent 5 year period.
2	Goods manufactured for export purposes	This is exempted from tax provided there is a certificate issued by Nigeria Export Promotion Council	Manufacturing business located in Accra/Tema enjoy 25% tax rebate; other regional capital enjoy 18.75% and those outside regional capital, 12.5%.
3	Foreign investment income brought in by a company	Exempted from tax once approved by government	Investment laws guaranteed 100% transfer profits, dividend etc.
4	Dividend derived from unit trust	Exempted from tax	A distribution of a resident trust is exempted from taxation in the hand of the beneficiary of the trust.
5	Dividends received from small companies	Those received in the first 5 years of their operation are exempted from tax	Dividends are generally taxed at 8%.
6	Expenditure of companies who engaged in R & D for commercialisation	20% investment tax credit is granted to such companies	Expenses incurred on R&D regardless of whether or not the expense is of capital nature is tax exempt.
7	Expenditure on Plant and Equipment in addition to Investment allowance	10% reconstruction investment is also allowable	Industrial Plant, Machinery and Equipment and parts thereof are

			exempted from customs import duty under HS Codes chapter 82,84,85 and 98
8	Payment of minimum tax	Certain companies are exempted from payment of minimum tax where assessable income results in a loss.	
9	Rural investment allowances	This is granted to companies that incur capital expenditure on provision of essential facilities as water, electricity, road etc. located at least 20km away from such facilities provided by government	Tax holidays in form of exemption period granted for farming, agriculture processing businesses, rural banks, rural estates developers and free zones.
10	Export Processing Zone	100% capital allowance granted to any company in any year of assessment on expenditure on building, plant and equipment incurred by any manufacturing company within and outside EPZ	10 years tax holiday is granted to companies operating in free zones, thereafter corporate tax is paid at a rate not above 8%.
11	Profits of company within and outside EPZ engaging in export business	3 year profits of such company is tax exempt. Also profit of companies, with proceeds from exports used in procuring raw materials and equipment, is tax exempt.	10 years profit is tax free but are taxed at 1% of chargeable income afterwards.
12	Expenditure for replacement of an obsolete plant and machinery	Investment tax credit of 15% is allowable provided such plant and machinery is for use in business	Expenses incurred on repair and improvement on plant and machinery is tax deductible but not exceeding 5% of written down value at end of the year. Excess (not allowable) is to be added to depreciation of the asset.
13	Companies engaged in solid minerals	They are exempted from customs and export duties on plant and equipment exclusive for mining operations	For companies or persons involved in farming, mining or manufacturing businesses for export, loss can be carried over for 5 years. Mineral royalties are specifically taxed at 5%
14	Pioneer companies	Under Industrial Development (Income Tax Relief) Act, tax is not payable by pioneer companies during the pioneer period	Various tax holidays ranging from 5 to 10 years are granted to different sectors to stimulate industrial and economic growth of Ghana
15	Reduction in company tax rates	CITA has been amended to reduce tax rate from 40% to 30%. This rate cuts across all sectors of the economy except oil and gas companies in the upstream sector which operates under PIT Act 2007. Manufacturing companies with turnover less than N1m pays 20% CIT in the first 5 years of operations.	Reduction in corporate tax rates from the normal 25% to 22% for companies engaged in hotel businesses to 8% for companies involved in non-traditional exports and 20% for financial institutions.

Source: GIPC, 2016; NIPC, 2016

## 2.5 Empirical Review and Hypothesis Development

Many studies have been done on tax incentives and economic growth, almost 80% of them have been directed at the national level. Nevertheless almost all of them agreed that incentives can only be effective where there is order. This was well captured by Maduka [33], he posits that there is no amount of incentives that can encourage serious businessmen to invest in an environment that is not orderly. This argument was supported by Aroh and Nwadiolor [34]. However, in the earlier work of Okafor [35], it was emphasised that the nation's economy can be healthy through generous tax incentives to corporate tax payers for them to invest their scarce resources. Maduka's opinion seems to be superior in the sense that orderliness is the first attraction, not incentives. Action aid International [36] regards tax incentive as revenue losses, this view was in line with Kwewuni [2] and CBN [5]. While Kwewuni [2] posits that tax incentive if not well managed could lead to a drain on government revenue, CBN was of the view that tax incentives creates loopholes for tax avoidance and further erode the tax base. The CBN [37] went further to state that incentive complicates tax administration as well as making revenue collection to be less efficient. This view was also anchored by Hassett and Hubbard [38] when they found that investment incentive create significant distortion by encouraging inefficient investment. But Bernstein and Shah [39] in an earlier work posit that selective tax incentives (investment credit and investment allowances) could be more cost effective for promoting investment than company income tax rate reduction. Oyedele [40] was worried that in spite of the efforts of Nigerian government at raising revenue through the introduction of luxury taxes and more tax incentives, it has not really addressed various tax disincentives that hinder growth and distort diversifications, hence the difficulty in earning enough revenue from tax, which was not the case with oil. But now that revenue from oil has nose-dived government has no choice but to remove all those disincentives and at the same time introducing more of those luxury taxes and tax incentives in order to increase revenue from tax in place of oil that is no longer a cash cow as before. Based on the above literatures, the researchers formulate the following hypothesis:

*H1: Tax incentive has no impact on the industrial and economic growth of Sub-Saharan Africa states.*

## 3. Methodology

### 3.1 Research Design

This study adopted an explanatory non-experimental research design to investigate the relationship between economic and industrial growth, proxied by GDP, of selected Sub-Sahara African states, Nigeria and Ghana. Secondary data were collected from World Bank Data Index (WDI), Federal Inland Revenue Service, Ghana Revenue Authority, Nigerian Investment Promotion Commission, Ghana Investment Promotion Centre and Action aid International amongst others. Hypothesis was formulated and regression analysis was done on data obtained using OLS. Since the study aimed at investigating the effect of tax incentives on economic and industrial growth of nations, OLS seems to be the most appropriate technique to carry out such investigation; all the five assumptions of regression were also tested to confirm the assertion. The paper is also a product of structured survey of articles and recently published texts. The emphasis of this paper was on equation models that allow the determination of the relationship between tax incentives and industrial and economic growth (proxied by GDP) using the above mentioned secondary data for the 4 year period 2011 - 2014. The model for the study is given as:

$$\text{GDP} = f(\text{TR}, \text{TI})$$

$$\text{GDP}_{it} = \alpha_i + \beta_1 \text{TR}_{it} + \beta_2 \text{TI}_{it} + \varepsilon_t$$

where:

GDP = Gross Domestic Product

TR = Tax Revenue

TI = Tax Incentives

$\alpha_i, \beta_1, \beta_2$  = Regression coefficients

$\varepsilon_t$  = Error terms

$it$  = Time dimension

## 4. Data Analysis and Findings

### 4.1 Descriptive Statistics

Summary of the description of explained and explanatory variables is presented below:

**Table 2**

Descriptive Statistic

Description	GDP	Tax Revenue	Tax Incentives
Mean	265.51238	5.91088	0.68263
Median	41.940	7.060	1.230
Maximum	568.508	7.832	1.230
Minimum	38.617	4.629	0.299
Standard Deviation	245.974	2.415	0.374
Skewness	-0.08	-1.791	-0.5
Kurtosis	0.997	4.576	2.177
Jarque-Bera	1.346	5.104	0.559
Probability	0.000	0.0003	0.000311

Table 2 reveals that for the 4 year period under review, the average GDP for the two countries studied was \$265.51bn, with a minimum value of \$38.617bn and maximum of \$568.08bn, attributed to the rebase of Nigerian GDP in 2013. In all, we considered the median value of \$41.940bn as it is not affected by extreme values, unlike the mean. The distribution of all the variables are negatively skewed. Jarque-Bera normality tests result in the rejection of null hypothesis as the probability attached to Jarque-Bera of all the variables are very small, hence the values of each of the variables are normally distributed at 1% significance level.

Augmented Dickey Fuller (ADF) test indicates that GDP is stationery at first difference ( $P = 0.000^*$ ) with lag 4 and t-stat of -2.7721, -2.5521, -2.3342 at 1%, 5% and 10% respectively. This prompted the use of log (GDP) as explained variable. For Total Revenue, null hypothesis of unit root was rejected at level as everything was stationery at level ( $P = 0.000^*$ ) with lag 0 and t-stat of -2.7022, -2.5231, -2.3012 at 1%, 5% and 10% respectively. Tax incentive was stationery at first difference ( $P = 0.002$ ) with lag 6 and t-stat of -2.7856, -2.5745, -2.3422 at 1%, 5% and 10% respectively.

A summary of the results of the Ordinary Least Square (OLS) regression is also presented as below.

## 4.2 Regression Analysis

**Table 3**  
Ordinary Least Square (OLS) Result

Variables		Key Indicators			
GDP	Pearson Correlation	Standard Error	t-statistics	Probability	Remark
Constant	1.00	63.2458	0.614	0.1543	Un significant
Tax Revenue	0.725	10.0957	2.985	0.0317	Significant
Tax Incentive	0.529	42.7736	3.0452	0.0311	Significant
Dependent variable: GDP					
Independent variable: Total Revenue, Total Incentives					
R-squared	0.8423		Durbin-Watson	1.50117	
Adjusted R-squared	0.7790		Sum of squared residual	65193.843	
SE of Regression	114.187427		F-stat (one tailed test)	299.2114	
			F-stat (two tailed test)	149.6057	

From the results analysed in Table 3 above, the independent variables (Tax Revenue and Tax Incentives) were perfectly correlated. There is a presence of multi-collinearity in the result with dependent variable (GDP) constant at 1 and Tax Revenue (TR) at 0.725 and Tax Incentive (TI) at 0.529. As for the goodness of fit in the model, the adjusted R-squared of 0.7790 indicates that the regressors (TR and TI) explain 77.90% of the variance in GDP, while the remaining 22.10% left unaccounted for is attributed to the error term. With F-stat (one tailed) at 299.2114 and (two tailed) at 149.6057 with p-val. at 0.0001 and 0.0002 (at 1%) and 0.00049 and 0.00098 (at 5%) respectively; all point to significance of the test, we therefore reject the null hypothesis and accept the alternate hypothesis that states that tax incentive has impact on industrial and economic growth of Africa. Durbin-Watson regarded as a classical test statistics for serial correlation with any figure close to 2.0 said to be a sign of no serial correlation. At 1.50117 we can conveniently state that there is no sign of serial correlation in our data. Results from the computation show that tax incentive has a positive effect on the industrial and economic growth of Africa.

## 5. Conclusion and Recommendations

The study espoused the impact of tax incentives on industrial and economic growth of Sub-Sahara African states, using Nigeria and Ghana as case studies. The result indicates 0.529:1 relationship between tax incentives and GDP at the moment. It behoves on African nations to improve on the tax drive now that revenue from petroleum products is declining by the day. Increasing tax incentives in the productive sectors would go a long way in reducing cost of production thereby increasing productivity of industrial sectors, with multiplier effects on economic growth of the nation (GDP). Even though incentive stimulates growth in tax revenue in a way, Actionaid [36] sees incentive as loss of total tax revenue accruing to the nations. Their report revealed a total annual loss of \$5.8 billion to three countries (Nigeria, Ghana and Senegal) in West Africa, \$2bn annual loss was also reported in selected East African states as Tanzania, Kenya, Uganda and Rwanda. This view aligns with Somorin [41], when she reported tax revenue loss of N56.8bn, N71.2bn and N54.9bn respectively for 2004, 2005 and 2006 resulting from various tax incentives granted by Nigerian Customs Services. Considering the positive and meaningful multiplier effect tax incentives can bring to the growth in economic and industrial activities of a nation, we recommend that African states should grant more

of such incentives to productive and priority sectors of their economy. Governments should closely monitor the administration of such incentives through a special parastatal expected to keep track of the policy, generate relevant financial data of the actual amount of incentive relative to the economic growth from one period to another. By so doing they will be able to confirm the efficiency of tax incentive policy in the economy.

## 6. Limitation and Future Research

The limitation of this study is that only two countries were used out of the fifty (50) nations that make up the Sub-Saharan Africa, thus making generalisation of the result of this study impossible. Efforts can be made in the future to consider a larger number of countries or that comparisons can be made on regional basis using the same area of study.

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