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The Impact of Environmental Energy Taxes on Nigeria's Insecurity Situation

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ABSTRACT

It is critical to enhance environmental energy taxes in order to offer a more secure business climate in Nigeria. Insecurity in Nigeria is severe, and it has become a component of the country's environmental problem to deal with. This research investigates the influence of environmental energy tariffs on Nigeria's insecurity condition. The research approach is cross-sectional, and secondary data from 2010 to 2020 were used in this study. According to the multiple regression results, all factors have a substantial beneficial influence on the country's insecurity management. The petroleum profit tax, gas exploration tax, and level of freedom from corruption, all have a good and substantial impact on security management. The study indicates that the government has significantly utilized environmental energy taxes to combat insecurity. However, if the country will be totally free from corruption, insecurity will be minimized. Therefore, the study urges immediate participation of international community in the Nigeria's insecurity concerns. This move has become extremely essential to salvage the country from all ecologically connected difficulties and to guarantee peace and safety for all inhabitants. Concerning corruption, it is high time for the government to begin looking for the sponsors of insurgency and abduction in order to punish them more severely.

1. INTRODUCTION

Energy taxes are resource taxes that include taxes on oil, fuel, gasoline, and carbon emissions [1]. Extraction of minerals, oil, and gas are ground breaking tasks resulting in carbon discharge. In Nigeria, extractive industry activities include crude petroleum and natural gas extraction, metal ores, coal mining, quarrying, and other mining operations [2]. Carbon emissions gases emitted by oil and gas industries are taxed in order to decrease their negative environmental impacts. Energy taxes, on the other hand, can boost regional revenue, which is largely used to control environmental concerns such as insecurity. Felder and van Nieuwkoop [3] stated that social security is a critical policy problem that must be incorporated into a country's financial framework. It is also not advisable to raise payroll taxes in order to prevent negative consequences for citizens and future generations [3]. As a result, other sources of revenue to fund instability in a resource-based economy become critical. According to reference [3], politicians find it extremely convenient to explore various means of dealing with insecurity, and the only options available to them are energy taxes and Value Added Taxes, which do not impose a significant cost on the public.

Environmental pollution and efforts to decrease its dangers to people and plants through fiscal policies and instruments such as carbon emission taxes, fuel taxes, and gas flaring levies have become a hot topic for researchers and policy makers in both developed and developing countries worldwide. Carbon dioxide emissions, agricultural pollution, water contamination, gas flaring, pipeline vandalism, and, perhaps most importantly, Nigeria's high degree of insecurity are quite a number of concerns that characterize the level of environmental issues in Nigeria. Nigeria's insecurity condition is dismal and overpowering, defying the involvement and strength of the security forces. It includes everything from oil pipeline sabotage to insurrection, abduction, and all sorts of violence. Nigeria invests billions of naira each year to rehabilitate tunnels used to carry oil products, and several of such pipelines are vandalized each year [4]. Figures from the monthly financial reports of Nigeria's state oil corporation, NNPC, reveal that 1,161 pipeline sites were vandalized around the country in the 21 months between January 2019 and September 2020. The vandalism occurred on five pipeline axes across the country. The Port Harcourt axis of the pipes had the highest number of "pulverized points" during this time period, with 538 sites destroyed [4]. Millions of Nigerian citizens have lost their lives due to insurgency in different quarters of the country. The operations of the Boko Haram insurgency and its sponsor groups have been complicated by infrequent political turmoil, genetically inherited malfeasance, favouritism, divisiveness, poor discipline in practically every aspect of the general populace, and abductions, burglary, killing, exploitation, bomb attacks of churches and defenceless Nigerians, making it extremely hard for the Federal government to respond [5].

In June 2021, the United Nations Development Program estimated that the war's devastation to farming, medical services, and other necessities of life had claimed potentially

350,000 people - ten times the number of individuals gruesomely murdered by the conflict. Nigeria's security breakdown is wreaking havoc on education, particularly in the country's north. The 12-year-old Boko Haram insurgency and the recent upsurge in armed banditry had displaced more than 2 million people and caused the shutdown of an estimated 600 schools [6]. With this year's spate of student abductions, family members have also kept their children from classrooms. Boko Haram astounded Nigerians and the rest of the world in 2014 when it kidnapped 276 females from their school hostel in the northern town of Chibok [6]. Seven years later, more than 100 of the girls are still unaccounted for, and a recent book believes that 40 have perished [6].

The government is not sleeping or watching the situation deteriorate in the face of all of these security difficulties. The Federal Government has invested 4,467 billion Naira to address insecurity in Nigeria throughout the 11-year period covered by this research (2010–2020), yet there has been no notable accomplishment. Insecurity in Nigeria started with pipeline vandalism and kidnapping of oil companies' personnel and these are highly associated with oil and gas activities in the country. On the other hand, politicians who ought to have managed the situation compromise in one way or the other due to corruption in the Nigeria's governance system. Moise [7] asserts that corruption in the perspective of oil can effortlessly become a weighty outrage connecting the uppermost political positions. In this study we believe that both corruption and oil sector operations induce insecurity in Nigeria. Following this risk (insecurity) associated with oil and gas sector activities, this study poses that energy taxes should be beneficial enough to cope with the cost of social security in the country. The goal of this study is to determine the extent to which environmental energy taxes has impacted the country's fight against insecurity. The role of corruption is also assessed in this research, but it is not expected to positively influence insecurity cost. Environmental taxes are a significant sector of forthcoming fiscal tool for the world's governments, with the main goal of environmental preservation as well as promoting a healthy economy, while concurrently increasing budget for nation finances and with economic engagement [8]. Previous studies reviewed in this study did not incorporate the corruption element and failed to link insecurity with energy taxes. However, this study brings in this new philosophy which invariably estimates the level at which insecurity management absorbs energy taxes in an oil rich economy.

2. LITERATURE REVIEW

Felder and van Nieuwkoop [3] investigated the influence of energy tax revenues on Swiss social security costs. The study employed a simulation results-based model, which indicated that a 50% or 100% increase in energy taxes would reduce energy consumption while increasing government income to address social insecurity issues. The effectiveness of environmental tax policies was examined and predicted by Tu and Wang [9] using a macro econometric dynamic stochastic general equilibrium (DSGE) model. Bayesian estimation was applied to estimate dynamic parameters based on China's macroeconomic data from 1978 to 2018. The authors were of the opinion that the introduction of China's new environmental tax would result in a significant improvement in environmental quality due to a decrease in toxic waste. However, the analysis found that emerging regulatory levies might have a detrimental impact on economic development. Consumption, production, wages, and capital might all decline by 1.26 percent, 0.34 percent, 1.16 percent, and 1.12 percent, respectively, slowing China's development. Tu et al. [10] investigated the market response to firms in high-polluting industries, as well as the effects of external legal institutional quality and internal environmental reporting on firm value in the aftermath of the Environmental Protection Tax Law's enactment. The researchers discovered a significantly unfavourable market reaction to firms in heavy-polluting industries using an event study technique combined with ordinary least square regressions, but this negative reaction varied due to the projected rise in subsequent regulatory overheads.

From 2010 to 2017, Ganda and Garidzirai [11] used a system-Generalised Method of Moments (GMM) framework to assess the environmental consequences of tax regimes in 28 EU economies. The study's findings demonstrated that an aggregate environmental tax does not reduce greenhouse gas emissions as effectively as predicted, despite improving environmental sustainability. The results further showed that when environmental taxes were fragmented (energy tax and transportation tax), these transportation tax tool became more successful in decreasing emissions and improving green environment. Tan and Lin [12] used an inter-fuel and inter-factor substitution channel, to assess the impact of carbon taxation on CO_2 emissions as well as the ecological efficiency of China's energy-intensive sectors. A dynamic model and three-stage estimate technique were utilized to allow for the gradual adjustment process of the enterprises of varied fuels and factor inputs. Based on the replacement of fuels and variables, the results showed that levying a carbon tax will cause businesses to shift from using coal (which had a greater carbon efficiency) to consuming less oil/gas and electricity, and from consuming energy to spending more labour and capital.

Zatti [13] examined environmental taxes and subsidies implemented in Italy during the previous few decades in order to determine objectives, possibilities, and roadblocks to future growth. Data gathered from the main national data sources and reports, such as the recently established Catalogue of Environmentally Harmful Subsidies (EHSs) and ecologically friendly subsidies (EFSs), showed how the application and structure of taxes and subsidies had been, and continued to be, spearheaded by non-environmental goals, resulting in blended and not entirely good performance. Andersson [14] did a quasi-experimental study to demonstrate a substantial causal effect of carbon taxes on emissions, empirically evaluating the introduction of a carbon price and a value-added tax on transportation fuel in Sweden. Following implementation, carbon dioxide emissions from transportation fell by about 11%, with the carbon tax accounting for the lion's share of the reduction, as compared to a synthetic control unit created from a comparable set of OECD nations. Similarly, the carbon tax elasticity of gasoline demand became three times greater than the price elasticity.

Tan et al. [15] estimated the impact of the gasoline tax on China's social welfare using comprehensive household-level panel data and a fixed effects econometric specification. The counterfactual study found that a 51% rise in tax-inclusive fuel prices reduces automobile sales by 24.9 percent while increasing societal welfare to varying degrees depending on vehicle lifespan. The researchers discovered that, as compared

to auctioned quotas, the fuel tax resulted in higher automobile sales but higher social welfare. Hu et al. [16] quantified the impact of 'pollution tax' policy on modifying air pollutant emissions for the first time using a multi-region multi sector Computable General Equilibrium model. Their analysis showed that current tax policy was generally capable of reducing many short-lived air pollutant emissions such as SO_2, NOX, TSP, PM10, PM2.5, CO, VOCs, OC, NH3 and BC. According to the study, the significant effects only occurred in regions with large economic scales - that is - Guangdong, Shandong, and Zhejiang provinces) and places with high emission intensity (i.e. the electric power and non-metal manufacturing sectors. However, the total effect of current policies on air pollution reduction was rather minor at the national level, less than 2% compared to a business-as-usual scenario. In the study of Omodero and Ehikioya [17], it was discovered that energy taxes did not improve infrastructural development in Nigeria.

3. METHODOLOGY

The research focuses on how insecurity management responds to environmental fees. This study examines the usage of ecologically related taxes such as petroleum profit tax, gas exploration tax, and the mediating impact of corruption in reducing insecurity in Nigeria. The study used a cross-sectional research design to investigate the effect of an insecure scenario when funds are applied from energy taxes and the reaction when corruption is present. Petroleum profit tax (PPT) is an energy tax levied at a rate of 85% of profits. This is done while taking into account the environmental and security concerns related with crude oil exploration in the nation. The Organization for Economic Cooperation and Development provides the data for PPT (OECD). Gas exploration tax is levied at the same rate as PPT on all successful gas exploration business and exports. The information comes from the Organization for Economic Cooperation and Development (OECD). The cost of insecurity management is derived from the Central Bank of Nigeria's Statistical Bulletin, while the corruption perception index is derived from the Transparency International website. The data utilized in this study are secondary data that spans the years 2010 to 2020.

The research model for this study emanates from the unit root information which shows stationarity of variables datasets at levels. Thus, based on the fact that the study is purely testing the effect of the explanatory variables, multiple regression approach is considered most appropriate.

The model specified for this study is as follows:

$$Y=\beta_0+\beta X_1+\beta X_2+, \ldots, +\mu_{it}$$

where,

Y = Insecurity management cost (response/dependent variable);

X = Environmental associated taxes and corruption freedom level (independent variables)

β = Coefficient

μ_{it} = Error term

The above model can be specifically applied to this study as:

$$LOGINS=\beta_0+\beta_1 LOGPPT+\beta_2 LOGGET+\beta_3 LOGCPI+\mu_{it}$$

where:

INS = Insecurity management cost; PPT = Petroleum Profits Tax;

GET = Gas Exploration Tax; CPI = Corruption Perception Index (level of freedom from graft).

β_0 = Coefficient of the parameter estimate

β_1-β_3 = intercept

μ_{it} = Error term

On the *a priori*, we expect; $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$.

4. RESULTS OF ANALYSIS

Table 1 shows the result of the descriptive statistics which includes the mean, median, maximum number, minimum number, standard deviation, skewness, kurtosis and the Jarque-Bera. The descriptive statistics result is derived from with the aid of e-views statistical software. The mean and the standard deviation are two descriptive statistics that are often used. The mean represents the average level of data obtained, but the standard deviation indicates the variance, or how spread the data collected in that variable is somewhere around its mean. In this study, the mean values are 406, 2227094, 52869 and 26 for INS (Insecurity cost), PPT (environmental energy tax), GET (Gas flaring/exploration tax) and CPI (corruption perception index) respectively. Similarly, the standard deviation values for INS, PPT, GET and CPI are 147, 728864, 35342 and 1 accordingly. As a result of this finding, the data spread is observed to be around the mean since there is a modest spread. The PPT and CPI are adversely skewed, but INS and GET are somewhat positively skewed. The Kurtosis, as well as the Jarque-Bera, indicate that the data is normally distributed. For INS, PPT, GET, and CPI, the Jarque-Bera p-values are 0.58, 0.59, 0.72, and 0.74, respectively.

The study makes use of group unit root test by Levin, Lin & Chu and the result shows that the variables' data are stationary at level. The result of the unit root is shown in Table 2.

Table 1. Descriptive statistics

	INS	PPT	GET	CPI
Mean	406.09	2227094.	52869.27	26.13
Median	398.00	2467581.	42227.00	26.00
Maximum	669.00	3201319.	115567.0	28.00
Minimum	224.00	1157808.	7727.00	24.00
Std. Dev.	147.35	728864.0	35342.56	1.22
Skewness	0.69	-0.292404	0.229250	-0.37
Kurtosis	2.37	1.608240	1.895756	2.13
Jarque-Bera	1.07	1.044541	0.655223	0.59
Probability	0.58	0.593172	0.720643	0.74
Sum	4467.00	24498036	581562.0	287.49
Sum Sq. Dev.	217124.9	5.313131	1.252525	15.07
Observations	11	11	11	11

Source: Authors' calculation, 2021

Table 2. Group unit root test: Summary

Series: INS, PPT, GET, CPI **Sample: 2010 2020**				
Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.26576	0.0117	4	39

Source: Authors' calculation, 2021

Table 3. Investigative tests

Type of test	P-value
Ramsey RESET Test	0.34
Breusch-Godfrey Serial Correlation LM Test	0.79
Heteroskedasticity Test: Breusch-Pegan-Godfrey	0.22
Jarque-Bera P-Value	0.73
LOGPPT-VIF	1.34
LOGGET-VIF	1.31
LOGCPI-VIF	1.04

Source: Authors' calculation, 2021

Table 4. Result of the regression analysis

Variables	Result of Analysis	P-Values	Level Of Significance	Remarks
R	0.815			
R Square	0.664			
Adusted R Square	0.520			
Std. Error of the Estimate	0.106			
Durbin-Watson	2.116			
F-Statistic	4.608	0.04	5 percent	Significant
T-Statistic:				
LOGPPT	2.094	0.07	10 percent	Significant
LOGGET	3.020	0.02	1 percent	"
LOGCPI	1.992	0.08	10 percent	"

Dependent Variable: LOGINS
Source: Authors' calculation, 2021

Robustness check

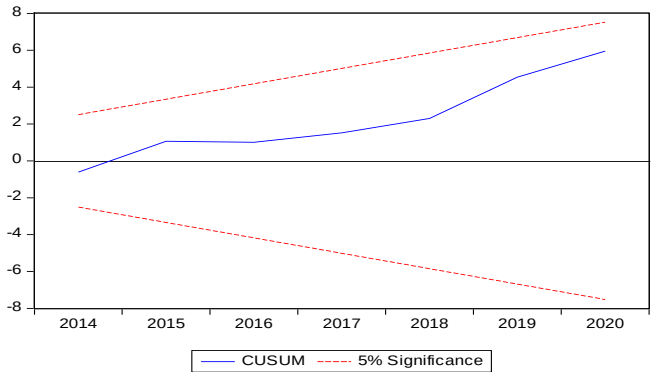

Figure 1. CUSUMtest

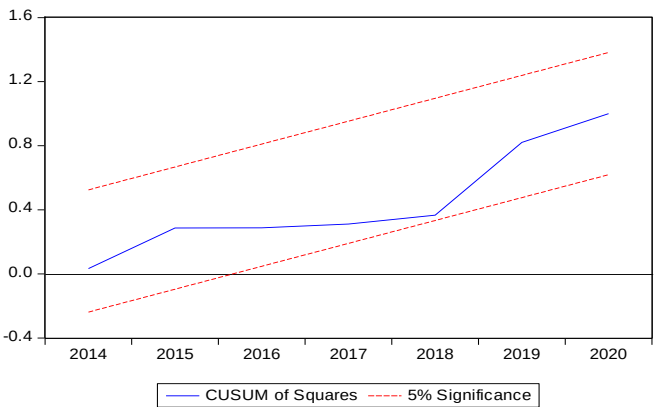

Figure 2. CUSUM of squares

The diagnostic test for establishing the absence of multi-collinearity, heteroskedasticity, serial correlation, model stability, and normality of data set distribution is shown in Table 3. The p-values for the Ramsey RESET test for stability are 0.34, which is more than the 0.05 level of significance. The Ramsey Regression Equation Specification Error Test (RESET) is a general linear regression model specification test in this format. It specifically investigates whether non-linear mixtures of estimated values help to explain the dependent variables. The premise behind the test is that if non-linear combinations of determinants have any chance of explaining the response variable, the model has been wrongly specified. When the p-value is above 5%, it suggests that the model used in this study is stable. The Breusch-Godfrey Serial Correlation test has a p-value of 0.79, suggesting that serial correlation does not exist because it is more than 5%. The p-values for heteroskedasticity and Jarsque-Bera are 0.22 and 0.73, respectively. These values are more than 5%, suggesting that the model has no heteroskedasticity and that the data set is normally distributed. The Variance Inflation Factors (VIF) for multi-collinearity are considerably less than ten, suggesting that multi-collinearity does not present among the independent variables.

The results of these tests, help to establish the correctness and appropriateness of the statistical model applied in this study. The benchmark for the testing is that their p-values must greater than 5% while the VIF should not be above the value of 10.

To avoid linear function systematic error, the robustness of the coefficients in the generated model is verified using the CUSUM test and CUSUM of Squares tests. If the statistic falls between the indicated confidence intervals, the estimated coefficients are constant. Figures 1 and 2 demonstrate the results of these stability tests. The projected results for both tests are within confidence intervals at the 5% significance level, the model's stability is verified for the given sample period. That is, the blue line is between the frontiers of the red dotted lines.

Table 4 displays the results of the regression analysis. Table 4 shows the R value of 81.5 percent. This study suggests that energy taxes have a strong and positive link with the management of Nigeria's insecurity problem. Actually, insecurity in Nigeria started with oil pipeline vandalism and abduction of expatriates by the Niger Delta Militants as a way of showing oil companies' neglect of environment degradation in the region. Thus, there is a strong relationship between insecurity and energy taxes as explained by the value of R. The R Square is 66.4 percent, which indicates how much PPT, GET, and CPI affect INS variations. The Adjusted R Square of 52% is less than the R Square, indicating that the correlation value is reliable. Adjusted R Square is used to evaluate the consistency of the correlation figure and to confirm that the addition of independent variables did not result in over fitting. The standard error of the estimate is less than one, suggesting that this study's prediction is true. There is no autocorrelation since the Durbin-Watson is 2. The model is appropriate and statistically significant because the F-statistic p-value is less than 5%. The CUSUM of Squares and CUSUM test in Figures 1&2 confirm the model's stability for this research.

The PPT t-statistic indicates that the influence on INS is considerable (7%). This result demonstrates that the petroleum profit tax is significantly used to fund the country's security issues. At a 2% threshold of significance, the GET effect on INS is substantial. This finding demonstrates that the gas

exploration tax is heavily used to regulate Nigeria's insecurity condition. The degree of freedom from corruption is also playing a substantial beneficial role, with an 8 percent influence on insecurity. The conclusion of this result is that insecurity in Nigeria has swallowed so much of the environmental energy taxes, and freedom from corruption could significantly aid the reduction of Nigeria's insecurity. The high level of corruption has thwarted the government's efforts to combat insurgency, pipeline damage, and abduction, despite the fact that a large sum of money has been invested to combat these crimes.

5. CONCLUSION

Energy usage is critical, especially in emerging economies. As a result, in order to minimize environmental contamination, energy usage must be tightly controlled [18]. As a result, it is important to emphasize that energy taxation is the finest control tool in the modern era. It also increases government revenue, which assists in the administration of social security concerns. Based on the above assumption, this study investigates the usage of environmental energy taxes in managing Nigeria's insecurity. Freedom from corruption is a moderating variable, but its inclusion stems from the fact that insecurity has persisted in Nigeria for a long time as a result of corrupt governance and practices. The corruption perception index (CPI) captured by the Transparency International indicates that Nigeria's level of freedom from corruption has been low. It suggests that the country has a lot of work in the fight against graft. The cost of insecurity in Nigeria is on the increase annually and yet the rate of kidnapping and insurgency is not reducing. According to the findings of this study, environmental energy tariffs have a substantial influence on insecurity management.

Based on the findings, the study suggests the introduction of some other energy taxes such as carbon emission taxes, transportation taxes and pollution taxes. In this study, we recommend that companies engaged in oil and gas production should be more engaged in community and social obligation through employment of pollution control equipment and expert devices that could monitor criminal activities. The government should make an effort to enlist the assistance of countries with insurgency fighting skills. The situation is extremely tense, affecting nearly every aspect of the economy. People no longer travel freely and are unsure of what the following day will bring, thus social activities are virtually dead. It is critical that the government engage the international community in order to give the country with immediate help in combating insecurity in Nigeria. In the same manner that Transparency International assists in capturing the rate of corrupt activities, some other independent intelligence groups and security specialists might be enlisted to assist in locating the corrupt individuals who are funding insurgency in Nigeria. All those who support insurrection and abduction should be targeted for harsher punishment.

Limitation to this study: This study has a major drawback that we would like to mention in this section. There were almost no empirical studies connecting energy tariffs with social security. Although numerous studies on environmental or energy taxes were referenced in this research, only Felder's (2000) draft work is directly related to this current effort. As a result, academics are encouraged to find this area of research essential and fruitful, as it has become critical for the government and policymakers to use energy taxes to manage social security issues in order to provide a hospitable business climate. There is no organization that can survive in an environment of insecurity, when expatriates and site workers are kidnapped and corporations are compelled to pay a ransom for their release. The insecurity environment in Nigeria has hampered the operations and efficiency of oil and gas firms.

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