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OIL VANDALISM COST AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT: *The study investigated oil vandalism cost and economic growth in Nigeria from 1970-2022. The specific objective was to determine the economic implication of oil vandalism on the overall growth of the Nigerian economy, particularly the Niger Delta Region. The date required was obtained from the following sources: Nigerian Natural Resource Charter (NNRC), National Bureau of Statistics (NBS), Central Bank of Nigeria (CBN) and Pipeline and Product Marketing Company (PPMC). The study applied unit root test for stationarity. The Autoregressive Distributed Lag (ARDL) techniques were employed. As expected, all the variables in the long run have a negative sign implying that activities of oil pipeline vandalism have a negative effect on economic growth. A unit increase in the crude oil lost, cost of repair/ maintenance and product losses respectively, will induce a negative effect on GDP. The study concluded that oil vandalism does have negative effect on the economy in the long run. It therefore recommends that the government should look at the challenge of militancy in the Niger Delta region for once, not to promise them heaven on earth, but at least try to meet some of their legitimate demands.*

KEYWORDS: vandalism cost, economic growth.

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INTRODUCTION

Since the drilling of the first commercial well in Oloibiri present day Bayelsa state on Sunday 15th January 1956 by Shell Darcy, Nigeria has been regarded as a major crude oil producer. Given an estimated 35.3 billion barrels of hydrocarbon both onshore and offshore assets typically shacked in the Niger Delta basin. Nigeria is ranked Africa's largest producer of oil and the six largest oil producers in the world, with a production rate of over 2 million barrels per day (Brickstone Africa, 2018).Nigeria is among the world's top 10 crude oil exporters and a key supplier to India, Brazil and Europe, providing billions of dollars in income for foreign oil and shipping firms (Brock, 2013)

The incidence of pipeline vandalism by Niger Delta Avengers and other militant groups has been on the rise in Nigeria which is affecting Oil production thereby making the country's output projection of 2.2million bpd to now drop to less than 1.1million bpd (CBN, 2016; and Uchechukwu, Ayuba, & Mohammed., 2017. This has affected Gas supply for electricity generation and distribution in the country thereby crippling business activities and economic growth which calls for immediate action that will put a stop to the ugly situation so as to restore confidence into the power and energy sector which will pave way for business activities to thrive and subsequently, economic growth and development(Uchechukwu, Ayuba, & Mohammed., 2017).

In Nigeria, oil pipeline vandalism has been perpetrated principally by criminal syndicates who are motivated by the desire to loot oil products for material aggrandizement. This organized crime is often aided and ablated by the state agents, which gives it a semblance of a franchise. Oil pipeline vandalism is also known in Nigeria as oil bunkering, which is the act of drilling into the pipelines with the intent to steal products (Okoli & Orinya, 2013).

Collier & Hoeffler, (2006); (Balogun, 2018) identifies greed as the driver of oil related criminality and youth belligerency in the context of a complex history of oil exploration and production and petro-capitalism to gain access to oil wealth and rents through clientelist networks. The greed proponents establish a strong correlation between resource endowment and risks of civil wars; a relationship which has been confirmed by the wars in Angola, Sierra Leone, Congo Democratic Republic and Liberia. In this context, rebellious acts are defined through the prism of resource predation (Collier, 2003)(Balogun, 2018)

Between 2010 and 2012, total of 2,787 lines breaks were reported on pipelines belonging to the NigerianNational Petroleum Corporation (NNPC), resulting in a loss of 157.81 mt of petroleum products worth about N12.53bilion. Pipeline along the Gombe axis recorded 850 cases and Kaduna system recorded 571 cases ofpipeline vandalism. The pipeline along Warri axis recorded 548 cases of vandalism while mosimi systempipelines in Lagos recorded 463 cases and port-harcourt recorded lesser cases with 336 point vandalized (NNPC,2016).

It is estimated that about 25% of oil stolen in the Niger delta is refined in the Niger delta. This 25% is equivalent to a $300 million per annum industry (Omoregie, 2018). Just recently on the 23rd of March 2023, troops of the Nigeria military conducted an operation at the creeks, waterways, in the sea, towns and cities of the Niger delta with significant result that led to the discovery and destruction of 107 illegal refining sites, 140 storage tanks, 58 reservoirs, 151 ovens, 68 dugout pits

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and 22 boats. This same operation saw to the recovery of about 561,200 liters of crude oil and 119,000 liters of diesel amongst others (Premium Times Agency Report). This incapacitation of crude oil refineries in Nigeria owing to pipeline vandalism is a really big concern and has thus prompted this research.

The Niger Delta region represents $400 billion in contributions to Nigerian Gross Domestic Product (GDP) annually, 9% of which is represented by oil and gas production. Nigeria faces numerous security challenges not only in its exclusive economic zone (EEZ), but also in the waterways and creeks of the Niger Delta. These challenges include oil theft, refining oil, smuggling, militancy, community struggles, cultism, and maritime criminality, including piracy (Jacobsen, 2021).For the period 2005-2008, the World Bank reports that Nigeria lost billions of dollars in oil revenue due to theft and foregone production (Schultze-Kraft, 2017).

The region's challenges are compounded by widespread poverty (70% of the Niger Delta population of approximately 30 million people live below the poverty line of $1/day), combined with the region being one of the most polluted in the world. In 2020, The National Bureau of Statistics indicated that more than 33% of the population is unemployed. Authentic refineries are recurrently faced with possibilities of shutting down as a result of malfunctioning equipment and poor maintenance culture given income lost from oil theft (Olujobi et al; 2022).

The major challenges of pipeline vandalism are poor policing and protection of pipeline infrastructure,political/militant agitation and endemic corruption. However, the fundamental issues are the attendantconsequences of pipeline vandalism such as product theft and expenses arising from repair of vandalised product which all affect the human development index in Nigeria. The study investigates these problemsand came up with some policy recommendations.

The study focuses on the economic implication of oil vandalism in Nigeria for the period 1970-2022. The period was chosen for robustness in study and to allow for the periodic assessment of indigenization policy. In effect, this study has provided answers to these questions: First, what is the effect of oil vandalism on economic growth in Nigeria? Second, what is the economic cost of oil vandalism on the economic growth of Nigeria? Third, what is the effect of petroleum product theft on the economic growth of Nigeria? In the light of these questions, the objectives of the study are: to examine the effect of oil vandalism on economic development in Nigeria, investigate the economic cost of oil vandalism on economic growth in Nigeria, and to assess the effect of petroleum product theft on the economic growth of Nigeria. Again, there have been numerous reports over the years about how much is lost in oil and gas, especially as it pertains to crude oil theft, however, little or nothing was said about the other cost implication of crude oil theft like pipeline vandalism, cost of product theft as well as the cost of repair. Thus, this study contributed to the body of knowledge by filling the gap.

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LITERATURE REVIEW

Conceptual Issues

Vandalism

Vandalism is an action involving deliberate destruction of public or private property. Within the civic domain, vandalism denotes wilful destruction of public or government property in keeping with criminal or political intent. Oil pipeline vandalism therefore implies deliberate breaking of oil pipelines with the intent to steal petroleum products or to sabotage the government (Vidal, 2011, Okoli & Orinya, 2013).

The Nigerian oil Pipeline infrastructure has been subjected to incessant attacks by vandals over the years. The frequency of such attacks has been rather disturbing in the recent times. For instance, in 2023, just recently, an oil spill was recorded by the National Oil Spill Detection and Response Agency (NOSDRA), to have come from a Trans-Niger Pipeline operated by Shell that crosses through communities in the Eleme area of Ogoni-land, a region where the London-based energy giant has faced decades long pushback for its oil exploration (National Oil Spill Detection and Response Agency - NOSDRA, 2023); before now, in 2020 and 2021, a total of 822 oil spills have been recorded by NOSDRA. The incessant occurrence of oil pipeline vandalism in Nigeria has raised the question as to whether the pipeline networks were laid in such a manner that forecloses easy vandalism (Uchechukwu, Ayuba, & Mohammed., 2017).

Economic Growth

Economic growth is the increase in the inflation adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percentage rate of increase in real gross domestic product or real GDP usually in per capita terms. It is an increase in the capacity of an economy to produce goods and services compared from one period of time to another.

According to John (2022), economic growth is the process by which a country's wealth develops overtime. The term, he said, is frequently employed in talks of short-term economic success, but in the context of economic theory, it typically refers to a gain in wealth over a long period of time. A society's ability to produce more economic goods and services of higher quality and quantity is referred to as economic growth (Roser, 2021). Amadeo (2021) notes that, the increase in per capita income is the better measure because it is what reflects increase in the improvement of living standards of masses which should also reflect in terms of increase of output of goods and services.

Theoretical Framework

This research work is anchored on Queer Ladder Theory. The Queer Ladder theory was influenced by an American sociologist, Daniel Bell (1919-2011) who coined the idea of the 'Queer Ladder' in an attempt to explain the instrumental essence of organized crime as a desperate means of economic empowerment and social climbing. The basic assumptions of QLT can be highlighted thus:

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i. Organized crime is an instrumental behaviour, it is a means to an end.

ii. It is an instrument of social climbing and/or socio-economic advancement

iii. It is a means to accumulate wealth and build power (Okoli & Agada, 2014).

Often ascribed to this theory is the notion that organized crime thrives in contexts where the government's capacity to dictates, sanction, and deter-crime is poor; where public corruption is endemic, and where prospects for legitimate livelihood opportunities are slim (Okoli& Agada, 2014). Under these circumstances the incentive to indulge in crime is high, while deterrence from criminal living is low.

Empirical Studies

Eduh, Olaniyi and Lawane (2023) conducted a study that seeks to critically analyze the various manifestation of oil pipeline vandalism in the Niger Delta region of Nigeria, using the System thinking(ST) approach, which is necessary for capturing the involvement of host communities and oil and gas companies in causing oil spillage. They found out that the main motivation for oil pipeline vandalism is the need for the inhabitants to survive since the government and oil and gas companies have fallen short of their residents' expectation. Therefore, the paper concluded that there is need for a sustainable management strategy that can handle the issues of oil pipeline vandalism in the oil producing regions of Nigeria. Similarly, Azodo (2019) investigated, the effect of crude oil vandalism on oil revenue using ordinary least square method and granger causality test. The NOSRDA data set was used to estimate revenue loss, clean-up and repair costs in the study. The results showed that crude oil pipeline vandalization can lead to 6% or 10% decrease in oil revenue generated. The study recommends that other alternative source of transportation should be used in transporting crude oil. Umar and Othman (2017) examined the relation between socioeconomic, institutional factors and pipeline vandalism using confirmatory factor analysis (CFA). The study involved 264 respondents who were selected from the Niger Delta region using purposive and simple random sampling techniques. The results from the study shows the existence of a significant and positive relationship between poor management, poor governance, legal, and environmental degradation while significant, but negative relationship between marginalization and pipeline vandalism. The study recommends the need for institutional reform through improvement in infrastructural provision, and effective governance among others. Similarly, Nwachukwu (2017) using the resource dependence theory, examine the relationship between oil theft, pipeline vandalism, security costs and revenue. Eighty-eight middle to high level managers of oil and gas completed the factors that affect company revenue instrument. The results of the multiple linear regression analyses indicated the model was able to significantly predict revenue. The study recommends that the leaders of the oil and gas multinational companies could use the outcome of the study in creating strategies and policies that guide their operations in the region, which would improve the relationship with host communities and mitigate their efforts in reducing the loss of revenue. Uchechukwu, Agaba and Mohammed (2017) investigates pipeline vandalism and its implications on business activities in Nigeria. The study employed the use of both primary and secondary sources of data. A simple linear regression was used to analyze the data obtained from the formulated hypotheses. Findings based on the analysis reveals that, pipeline vandalism in Nigeria significantly affects business activities in Nigeria. The study recommended that federal

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government should through the NNPC collaborate with the nation's military and other security agencies to ensure adequate policing and protection of critical pipeline infrastructure.

METHODOLOGY

The proposed methodology for this study is determined by the research objectives. In view of this, econometric and statistical method of data analysis will be adopted. Given that the proposed study is hinged on times series data, the proposed study will adopt the Auto Regressive Distributed Lag (ARDL) Model given its robustness and depth of quantitative measurement.

The Nature and Sources of Data

The natures of data to be used are secondary data which will be sourced from the following: The Nigerian Natural Resource Charter (NNRC), The Nigeria Bureau of Statistics (NBS), The Central Bank of Nigeria (CBN), and Pipeline and Product Marketing Company (PPMC)

Model Specification

The model of this research is adopted from the works of Balasubramanyam et al (1996) endogenous growth theory with adjustment made to include variables such as vandalism, product theft and repair of vandalized product.

The model is specified thus:

Y=f(x)

$$GDP = f(V, PT, RP) \qquad eqn\ i$$

GDP as a dependent variable stands for real gross domestic product, proxied for economic growth

V – Vandalism, PT – Product Theft and RP – repair of vandalized product (the monetary implications of this variables will be used for measurements).

Expressing the above in the form of a linear equation implies

$$GDP = \beta_0 + \beta_1 V + \beta_2 PT + \beta_3 RP + \mu \qquad eqn\ ii$$

μis the stochastic error term

$$Log\ GDP = \beta_0 + \beta_1 LogV + \beta_2 LogPT + \beta_3 LogRP + \mu \qquad eqn\ iii$$

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Apriori Expectation of Variables

Variable name	Description	Unit	Anticipated effect
GDP	Gross Domestic Product	Naira (N)	Dependant Variable
VANDALISM	Cost of Vandalism	Naira (N)	-
PRODUCT THEFT	Cost of Product Theft	Naira (N)	-
REPAIR OF VANDALISED PRODUCT	Cost of Repair	Naira (N)	-

Source: *Authors' Design*

DATA ANALYSIS AND INTERPRETATION OF RESULTS

This section analyses and Interprets the results from the model of this study

Table 4.1 Unit Root Test

UNIT ROOT TEST TABLE (ADF)

At Level

	LOGCOILLOSS	LOGGDP	LOGMAIN/COST	LOGPRDTLOSS
t-Statistic	-1.4502	-1.3875	-0.4681	-1.4569
Prob.	***0.5516***	***0.5824***	***0.8896***	***0.5483***

At First Difference

	d(LOGCOILLOSS)	*d(LOGGDP)*	*d(LOGMAIN/COST)*	*d(LOGPRDCTLOSS)*
t-Statistic	-7.5298	-7.5849	-7.5764	-7.4936
Prob.	***0.0000*** ***	***0.0000*** ***	***0.0000*** ***	***0.0000*** ***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant
*MacKinnon (1996) one-sided p values.

Source: *Authors' Compilation using E - views 13*

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Table 4.1 Shows the summary of the Augmented Dickey-Fuller unit root test at levels and first difference in order to avoid spurious regression analysis. The result indicates that Autoregressive Distributed lag method is the most appropriate method of analysis for the study.

Table 4.2: Regression Result

Dependent Variable LOGGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGGDP(-1)	0.932644	0.050522	18.46021	0.0000
LOGCOILLOSS	0.006579	0.004114	1.599368	0.1159
LOGCOILLOSS(-1)	-0.007000	0.004100	-1.707193	0.0939
LOGMAINNCOST	0.008625	0.004118	2.094429	0.0412
LOGMAIN/COST(-1)	-0.008291	0.004131	-2.006860	0.0501
LOGPRDCTLOSS	0.019356	0.004944	3.915010	0.0003
LOGPRDCTLOSS(-1)	-0.018253	0.005026	-3.631934	0.0007
C	0.727480	0.567740	1.281360	0.2059
R-squared	0.972714	Mean dependent var		11.16017
Adjusted R-squared	0.968969	S.D. dependent var		0.017367
S.E. of regression	0.003059	Akaike info-criterion		8.615778
Sum squared resid	0.000477	Schwarz criterion		-8.334078
Log likelihood	262.1655	Hannan-Quinn criter.		-8.505814
F-statistic	259.7321	Durbin-Watson stat		2.043596
Prob(F-statistic)	0.000000			

Source: *Authors' Compilation using E-views 13*

As expected, all the variables in the long run have negative sign implying that all activities of pipeline vandalism have a negative effect on economic growth in the long run. A unit increase in the Crude Oil Lost (COILLOSS), Cost of Repair/Maintenance (MAIN/COST) and Product Losses (PRDCTLOSS) respectively, will induce a negative effect on GDP.

From the table above, the relationship between both dependent and independent variables are given thus:

GDP = 0.72 – 0.007(COILLOSS) – 0.008(MAIN/COST) – 0.018(PRDCTLOSS

Consequently, our result implies that both variables are significant predictors of development of the Nigerian economy. The above result thus conforms to our prior expectations.

The R-squared value of 97% shows the degree to which the model is nicely fitted and how the independent variables explain the dependent variable to a tune of 97%.

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The adjusted R-squared value of 96% aids the fact that the model is nicely fitted and the Prob (F – statistic) value of 0.000000 shows the significance of the regression model at 1%.

The durbin – Watson figure of 2.043596 implies that there is no incidence of auto correlation.

Table 4.3: **Short Run Effects**

Dependent Variable GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.067356	0.030123	-2.236068	0.0294
D(LOGCOILLOSS)	0.006579	0.003793	1.734758	0.0884
D(LOGMAIN/COST)	0.008625	0.003797	2.271727	0.0270
D(LOGPRDCTLOSS)	0.019356	0.004558	4.246425	0.0001
R-squared	0.607361	Mean dependent var		0.000522
Adjusted R-squared	0.585945	S.D. dependent var		0.004578
S.E. of regression	0.002946	Akaike info-criterion		-8.751371
Sum squared resid	0.000477	Schwarz criterion		-8.610521
Log likelihood	262.1655	Hannan-Quinn criter.		-8.696389
F-statistic	28.35931	Durbin-Watson stat		2.043596
Prob(F-statistic)	0.000000			

Source: Authors' Compilation using E-views 13

The result in the short run did not confirm to our A'priori expectation as all the dependent variable seems to be positively correlated to GDP. This reason for this is not far-fetched given that all these vices of Crude Oil Loss (COILLOSS), Cost of Repair/ Maintenance and other Product Loss actually do favors the locals given that it's the only way most of them survive as a result of marginalization from the government but in the long run, it has no real effect on GDP.

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Table 4.4 Correlation Test

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.047382	Prob. F(2,49)	0.9538
Obs*R-squared	0.113883	Prob. Chi-Square(2)	0.9446

Source: Authors' Compilation using E-views 13

The Breusch-Godfrey Serial Correlation LM test was employed as indicated in the table above in testing for autocorrelation in the model. The null hypothesis connected to the Breusch-Godfrey serial correlation LM test is that there is no serial correlation among the residuals 0.94>0.05, so on this basis, we accept the null hypothesis of no autocorrelation.

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoscedasticity			
F-statistic	0.558123	Prob. F(7,51)	0.7861
Obs*R-squared	4.198104	Prob. Chi-Square(7)	0.7567
Scaled explained SS	36.31069	Prob. Chi-Square(7)	0.0000

Source: *Authors' Compilation using E-views 13*

The probability of chi-square statistics is significant at 1% level of significance which accepts the null hypothesis of homoscedasticity, indicating that the model is free from heteroscedasticity as seen in the table above.

CONCLUSION AND RECOMMENDATIONS

Based on the outcomes of the analysis, the study concludes that oil vandalism does have significant negative effect on the economy in the long run. Although Crude Oil Loss, Cost of Repair/Maintenance and Product Loss does gratifies the economic needs of the angry marginalized youth in the short run who engage in such vices to get back at the government, however in the long run it cost the Nigerian Economy. This trend cannot continue because looking at the bigger picture, even the short run benefits to the marginalized youth is not really a win for them in the true sense of it because it is still less than what they deserve and are clamoring for.

Government should stop reinventing the wheel and take them seriously for once, not to promise them heaven on earth but at least try to meet some of the legitimates demands, once there is a breach of some sort, there should be consequences just so the youth know the government is committed and the government also knows the youths are committed in their course.

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