



Revenue Leakages and Economic Growth in Nigeria: The Place of Forensic Accounting

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Abstract: In this study, the effect of revenue leaks on Nigeria's economic growth from 2011 to 2021 was examined. This was done in accordance with the metrics of Oil Revenue Leakage, Non-oil Revenue Leakage, and Total Revenue Leakage, as well as their effects on Nigeria's economy as measured by Real Gross Domestic Product. The World Bank Statistical Bulletin, the American National Bureau of Statistics and the websites of the Central Bank of Nigeria and the Federal Inland Revenue Service were used to create data for the years 2011–2021. The dataset for regression was defined using descriptive statistics, and the stationarity of the data was tested using the unit root method. Correlation analysis and a multiple regression analysis were employed to see how closely the independent variables moved in tandem with the relevant dependent variable. Findings revealed that non-oil revenue leakage had a beneficial impact on economic growth while oil revenue leakage had a negative impact but was not statistically significant. Accordingly, the study's findings on the connection between Nigeria's GDP growth and revenue leaks were inconclusive. The report suggests that to promote a high rate of tax compliance and reduce the twin problems of tax evasion and avoidance to a tolerable level, the government should generate job opportunities for everyone through the smart use of tax resources.

Keywords: Tax Avoidance, Tax Evasion, Economic Growth, Forensic Accounting, Revenue Leakage

1. Introduction

1.1. Background

In recent years, Nigeria has seen a decline in a number of economic development metrics despite rising revenues and expenditures. With the data pointing downwards, progress as expected may be more of a pipe dream at this point. Although it has been argued that Nigeria's economy is going through a rough patch as a result of sudden and unwelcome changes that have benefited it, the rate of recovery is not what has been expected or accepted [5, 6], prompting calls for a policy check and a retreat from the policy thrust that has been emphasized to bring about economic recovery. An economic downturn is signaled by a combination of factors, including but not limited to price spikes, rising unemployment, a slowing economy, and a significant drop in foreign reserves [33]. Thus, macroeconomic goals have not

been achievable, and Nigeria must now evaluate and realign her fiscal policies to address the negative economic indicators that are impeding her progress toward economic growth.

As a result, forensic accounting is now an international concern due to the prevalence of financial fraud resulting in systemic losses in the private and public sectors alike. Among the most prominent examples of such dishonesty are Enron and World.com, Tyco, and Cadbury African Nation Restricted. A number of large corporations, including Enron, Arthur Andersen, WorldCom, Qwest, and ray of light, were victims of economic fraud in 2001. Financial reports may have been skewed by management in order to provide the impression of greater success. Companies may have over-leveraged in other countries due to tax and incentive restrictions. These events highlighted the requirement for a re-examination of the forensic accountant's role in preventing revenue leakages within a country's economic system [24].

Since the early 1970s, oil exports have provided the vast majority of Nigeria's foreign exchange earnings and federal government revenue. In 2000, oil and gas exports accounted for more than 98% of export earnings and about 83% of federal government revenue, cementing the oil industry's position as the economic backbone of the country. Some 35 billion barrels of oil and more than 100 trillion cubic feet of natural gas are thought to be in Nigeria's reserves (2,800 km). About 2.2 million barrels (350,000 metric tonnes) of crude oil were being produced daily in Nigeria in the middle of 2001 [28]. Over the years 1971–2005, Asekomeh, Alley, Mobolaji, and Adeniran estimated that Nigeria's oil exports generated \$390 billion in government revenue for the country [7]. Reduced U.S. crude oil imports from Nigeria in June 2014 caused the country to fall from fifth to sixth place on the list of the top crude oil suppliers to the United States. The price of oil was relatively stable until the middle of 2014, when it began a precipitous decline that would see it fall from \$114 per barrel to below \$50 per barrel in 2015 and then dip further to below \$35 per barrel in 2016.

In order for the government to adequately provide for the growing requirements of society, it must have access to massive sums of money that no single person or group of people could ever hope to raise [8]. Since the economy needs to be better funded in the long run, it is imperative that public resources be mobilized, and one way to do this is through taxation and the revenue it generates. However, even if a country like Nigeria were to generate the necessary revenue for growth and development activities, that would not be enough to ensure that the necessary infrastructural development would occur. This is because if revenue is poorly managed through allocation and expenditure, it may not be put to good use in stimulating economic growth and development.

1.2. Statement of the Problem

“Despite its reputation as Africa's largest country, Nigeria has been plagued by slow economic growth and widespread poverty. There are low levels of development indicators, such as a low income, characterized by a low per capita income, poor health, and a low life expectancy; a low level of human development rating (index) inadequacy in education; a high inflation rate; poor infrastructure and human capital development; and a recession in practice following sluggish economic growth in previous years. The country is able to accomplish all of these feats because to the massive influx of cash it receives from both oil and non-oil sources, like as value added tax and other levies.

Recent years have seen increased expenditures, and there has been much discussion of the exhaustion of the excess crude account and its reserves [2]. Some elites have responded by calling for a leadership change, while others have pointed the finger at the systemic corruption that has plagued previous governments and their leaders. In spite of this, widespread poverty among the population has persisted. It has been argued both for and against the fact that Nigeria's recent economic setback is the result of low revenue caused by the recent drop

in oil prices [6].

This may seem like a reasonable call considering the recent trend in oil revenue fluctuations, but is it reasonable when considering longer time frames and trends? When the price of oil skyrocketed in 2008, the world's central banks were able to stockpile more than \$20 billion in their excess crude accounts [36]. Exactly herein lies the rub. Even during the boom, tax collections did not keep pace with the burgeoning economy. Shortfalls in revenue due to leakage and failure to fulfil the civic duty of taxation have been another issue, and this is true whether or not incentives” are in place to encourage people to pay their fair share. Tax avoidance, evasion, and non-compliance result in annual losses in the tens of billions of naira [21].

It is on the above premise that the main objective of the study was to examine the effect of revenue leakage on the economic growth of Nigeria. With the following specific objectives:

- 1) Determine the effect of Oil Revenue Leakage on Economic Growth in Nigeria.
- 2) Assess the effect of Non-oil Revenue Leakage on Economic Growth in Nigeria.
- 3) Identify the effect of Total Revenue Leakage on Economic Growth in Nigeria.

One way to get there would be to have a system in place that effectively prevents these leaks in revenue, while another would be to ensure adequate transparency and fiscal restraint in spending those funds once they have been collected. In light of these concerns, the purpose of this research is to determine whether or not Nigeria would have a positive and statistically significant correlation between government revenue and economic development between 2011 and 2021. Based on this premise, the study aims to theoretically examine how revenue leakages affect economic growth in Nigeria. The study also makes an attempt to theoretically explain how forensic accounting could help reduce some of the leakages identified in both the oil and non-oil sectors of the Nigerian economy. The rest of the study is structured as follows: literature review; methodology; results and discussion; conclusion and recommendation.

2. Literature Review

In their study, Berembo and Igonikon looked at the connection between government revenue and economic growth from 2000 to 2017. The focus was on analysing the INR and GDP of Nigeria to see how they relate to one another [10]. The research used a descriptive, historical, and correlative approach, with data gathered from existing sources. Both the Central Bank of Nigeria's Statistical Bulletin and the National Bureau of Statistics' Annual Reports were mined for this study's data (various years). The information covered the years 2000-2017. In order to analyse the data and check the hypothesis, regression was used. Independent federal government revenue was found to have a positive and statistically significant relationship with GDP growth. When government revenue is used effectively by

leaders, especially those at the helm of affairs, improvements in infrastructure, the creation of jobs through the construction of industries, the production of goods and services, exportation, an increase in the average income of citizens, and overall economic growth are all possible outcomes. Economic growth and development will be hindered, poverty and the like will persist, and leaders who engage in corruption and other anti-patriotic activities will only deepen these problems.

2.1. Economic Growth

Per capita income growth is commonly used as a proxy for economic growth. When a country's GDP rises, so do its outputs of goods and services. Gbosi defines economic growth as "the relative increase in the output of goods and services over a period of time" [20]. So, it's the rise in the value of all goods and services produced in an economy as a result of higher resource quality and better technology. Various economic indicators can be used to track the growth or improvement of the economy. These metrics reveal the true health of an economy. Gross domestic product (GDP), per capita income (PCI), inflation, and the unemployment rate are some of the indicators. When economists talk about economic growth, they are referring to an increase in a country's gross domestic product (GDP) over a given time period [10]. Conversely, economic development refers to a long-term increase in national output per capita or gross national product. Consequently, it follows that the rate of growth in total output must be higher than the rate of growth in the population.

2.2. Revenue Generation

The ability to generate revenue is crucial in the administration of any economy, no matter its size or degree of development, since it determines where the money comes from to pay for government expenditures. According to the provisions of its 1999 constitution, Nigeria is a federation in which federally collected money is split between oil revenue and non-oil revenue (as amended). Revenue from oil and gas production is included in "oil revenue," whereas all other forms of income are included in "non-oil revenue" [29].

2.2.1. Oil Revenue

Nigeria now relies heavily on crude oil as its primary nonrenewable energy resource. More than 90% of the country's current foreign exchange profits and almost 80% of recurrent and capital expenditures are generated by this industry [4, 36]. As a result, the money made in this industry matters greatly to the country's economy. Roughly 2 million barrels of high-quality crude oil are extracted from Nigeria every day, and the country has a condensate resource of about 37 billion barrels [25]. The government's 20:2020 aspirations for development fall short of the oil reserves and development that are now in the works. The country has 3 percent of the world's natural gas reserves, or 183 trillion cubic feet. About half of the daily 8 billion cubic feet of gas production is exported, while the other half is flared. For the

foreseeable future, the oil industry will continue to be the key source of cash for the government's goal and objective of economic diversification [4, 9]. Therefore, oil money is the primary contributor to the Nigerian government's coffers. Not limited to, these include earnings from both the international and domestic sales of crude oil as well as earnings from taxes on petroleum profits.

2.2.2. Non-Oil Revenue

Earnings from the sale of all other commodities besides crude oil on global markets constitute "non-oil income" [23]. Activities outside of or unrelated to the oil and gas industries are classified as part of the "non-oil sector." Manufacturing, telecommunications, tourism, real estate, finance, construction, and healthcare are all examples of businesses that contribute to the economy in ways other than oil. Revenues for economic growth are derived from exports of non-oil items generated in the agricultural, mining, quarrying, and manufacturing sectors [16].

2.2.3. Revenue Leakages

It is axiomatic to state that there has been a rise in awareness and demand for more openness in the handling of money made from selling natural resources, particularly in oil-rich countries like Nigeria, which is mired in the so-called "resource curse." The reason for this is because despite the country's immense wealth from oil and gas operations, its residents do not reap many of the advantages [17].

An opportunity to reduce revenue leakage and stem corruption exists in Nigeria's oil and gas sector, and doing so could help strengthen the sector's governance and lessen the many incentives for the abuse of power and capture of revenues that distort Nigeria's politics and threaten the country's ability to use oil revenues to speed up economic and social development. [26].

Money leaving the economy due to leakage creates a disparity between supply and demand, as defined by Kromtit and Gukat [22]. Consumers who spend their money outside of their own nation or region force local firms to seek alternative sources of revenue. The Keynesian economic theory suggests that governments may have to inject cash into the system if leakage generates a shortage of capital.

To rephrase, it is the process through which money leaves a system rather than entering it. Leakage, in economics, is the loss of money in a closed-loop system. All consumer spending under a two-sector economy is redistributed to both employers and employees in the form of salaries and dividends. Income leaks occur when money is lost to things like taxes, savings, and imports. Leakage, in the retail industry, occurs when customers shop outside of their immediate area [17].

Incorrect pricing, operational inefficiencies, missing transactions, unpriced transactions, uncollected revenues, etc. are all potential causes of revenue leakage. The loss of income can occur at any point in the customer relationship life cycle, including prospecting, onboarding, transaction processing, invoicing and recovery, monitoring, and service closure. But there's no magic bullet to mend all those fissures

at once. Banks need a "Centralized Pricing and Billing Platform" to plug the leakage loopholes in addition to regular revenue audits, system integration reviews, customer performance tracking, and elimination of manual processes.

2.2.4. Tax Leakages

Leakages refer to the flow of money or resources outside of an economy or institution. This is the term used to describe the money that leaves a revenue cycle. Financial hardship arises when a person's disposable income is reduced as a result of taxation, savings, and other expenses. When discussing the economy, the term "tax leakages" refers to the money that isn't brought in because of all the ways in which money can "leak out."

2.2.5. Tax Evasion

If you don't report all of your income to the IRS, you're committing tax evasion. Taxpayers who evade paying their fair share of tax or reduce their tax liability by filing a false or fraudulent income tax return are in violation of the law [14]. Any behaviour on the part of a taxpayer that avoids or defers payment of taxes is illegal and is considered tax evasion. ICAN (2004), cited in [31], described it as fraud and deceit including the failure to disclose all sources of income or the purposeful underreporting of income. According to Garama, Mansor, and Pantamee [19], cited in Okoye, Amahalu, and Obi [31], tax evasion can be either "complete" or "incomplete." Complete tax evasion occurs when a tax-eligible citizen chooses not to register to pay taxes, whereas partial tax evasion occurs when a taxpayer manipulates his income to pay less in taxes.

2.2.6. Tax Avoidance

This translates to doing whatever is possible to minimise or avoid paying taxes. The taxpayer makes every effort to take advantage of all legitimate legal avenues for tax reduction or relief such as exemptions, deductions, concessions, allowances, and tax credits [31]. Tax avoidance is the deliberate avoidance of tax by a taxpayer by exploiting a legal loophole in the tax system rather than by engaging in illegal activity [31]. To avoid paying too much in taxes, it's perfectly legal to do things like hiding income or using loopholes. You can reduce your tax bill by converting income from one tax bracket into another that has a lower rate. For instance, company owners who are cognizant of the fact that taxation is based on earnings may falsely claim that they did not generate any profit. Also, gifts to nonprofits like hospitals, universities, and churches can help you avoid paying estate tax.

2.2.7. Forensic Accounting

The term "forensic accounting" is used to characterize the expanding area of accounting that arises as a result of engagements arising out of disputes and litigations, both current and potential. It is commonly accepted by Okoye and [30] that "Forensic" implies "fit for use in a court of law," and Forensic Accountants adhere to this definition when performing their work. Accounting in the forensics field is

used to investigate possible wrongdoing with a company's or person's finances. A qualified forensic accountant may find employment in either the private sector or the public sector. Forensic accounting has been around for a while, but it has developed through the years to incorporate new methods of investigating and analysing financial data [15]. Therefore, forensic accounting may be understood as the branch of bookkeeping most amenable to judicial scrutiny, providing the most possible certainty. Given this, it would be prudent to hire forensic accountants to look into government revenue agencies with an eye toward pinpointing the root cause of the country's continual decline in oil and non-oil revenue.

2.2.8. Oil Revenue Leakages and Economic Growth

Between 1980 and 2017, Brown and Nnamaka analysed the impact of oil income on economic growth in Nigeria [11]. The GDP, oil revenue, oil rent, and domestic price of gasoline time series data came from secondary sources. The investigation began with a look at the series' descriptive statistics, then moved on to assessing each time series' stationary status with the Augmented Dickey-Fuller method. Both the short-run and the long-run parameter coefficients were estimated using the ARDL model. An established long-term link between the variables is indicated by the F-statistics from the co-integration test of the bound. The research indicated that oil income and oil rent had a favourable, albeit not statistically significant, effect on GDP over the long term. Both factors, however, slowed Nigeria's economy in the short term. This is another evidence that the country has been badly stewarding the massive windfall it has experienced due to its abundance of crude oil. Increasing the price of gasoline in the United States has had a favourable effect on economic growth. The study concluded that prudent spending of oil revenues was necessary for long-term, sustainable economic growth. Furthermore, given crude oil is a depletable resource, the Nigerian government, in light of recent volatility and uncertainty in the oil sector, should launch a realistic diversification strategy to alternative sectors of the economy to boost the productive base of the nation.

2.2.9. Non-Oil Revenue Leakages and Economic Growth

The impact of non-oil earnings on economic growth in Nigeria was studied by Adeusi, Uniamikogbo, and Erah [3]. Value Added Tax, Company Income Tax, Personal Income Tax, and Customs and Excise Duties were employed as proxies for non-oil revenue, while GDP stood in for economic expansion in Nigeria. Companies in the upstream sector are excluded from the research population. The population includes all individuals, single proprietorships, and corporations that have paid taxes to the Nigerian government. Using a census sampling strategy, the research sample includes the whole population being studied. Information for the years 1994-2018 was compiled using secondary sources such as the 2018 Federal Inland Revenue Service Statistical bulletin and the 2019 National Bureau of Statistics. The information was analysed using OLS regression and descriptive statistics. Indirect taxes (Customs and Excise Duties, and Value-Added Tax) were shown to

have a significantly larger beneficial impact on economic growth in Nigeria than did direct taxes (Companies Income Tax and Personal Income Tax). Furthermore, direct taxes have a large and counterproductive impact on economic development in Nigeria. Therefore, it was suggested that clear and transparent tax rules be developed to control the tax regimes in Nigeria, since this would prevent any illegal strategic tax behaviour on the part of management. Good tax reform plans should also have little trouble being implemented. The relevant tax authorities should propose measures to tighten their oversight of the key factors highlighted in this research.

2.2.10. Revenue Leakages, Forensic Accounting and Economic Growth

Investigation whether Forensic Accounting Techniques may be used as a silver bullet to stop revenue leaks in Nigeria's Federal Universities was carried out. Using a research questionnaire, primary data were gathered for this investigation. From a count of EFCC, internal audit employees in selected Nigerian Federal Universities, we were able to draw 238 responses for our sample. As a statistical method, this research analysed the connections between Forensic accounting and revenue losses. Results from this study's approach demonstrate that revenue leaks at Nigeria's Federal Universities may be reduced using Forensic accounting data analysis techniques. This suggests that income leaks at Nigerian Federal Universities can be uncovered via forensic data analysis [24]. When these technologies are used, it is expected that income losses would be drastically cut down. Based on the results, it was determined that implementing forensic accounting practices at Nigeria's Federal Universities would be beneficial in stopping income leakage. To assist stop income loss, it was suggested that Nigeria's Federal Universities use forensic accounting data analysis and technological tools. This will aid in the identification and evaluation of fraudulent activity patterns, as well as the creation of various forms of digital tools that may be used to combat economic and financial crimes.

2.3. Theoretical Review

The Resource Curse Theory and the Keynesian Theory have been used to underpin this study.

2.3.1. Resource Curse Theory

The term, "resource curse is used to describe the unfavourable correlation between a country's abundance of natural resources and its level of social and economic progress. According to the hypothesis, countries with plentiful natural resources are less likely to employ those resources to advance economic and social development, and their performance is worse overall compared to those with less natural resources. Poverty, environmental devastation, corruption, and war are common in countries with abundant natural resources. In comparison to countries without natural resources, those who are heavily reliant on oil exports are

much more likely to experience civil war (23% vs. 0.6%) [12].

The resource curse occurs when a country's economy focuses too heavily on a small number of industries that have a direct relationship to its natural resources, preventing it from developing other sectors. The Dutch sickness, from which the resource curse paradox originates, is a result of the negative impact that a rise in the real exchange rate had on the agricultural and manufacturing sectors in the Netherlands in the 1960s, after the country's discovery of natural gas in the North Sea. The government and national economy are particularly vulnerable to shocks associated with oil because of the substantial rents it offers [13, 18].

2.3.2. Keynesian Theory

John Maynard Keynes' classical theory, published in the midst of the Great Depression that rocked western global economies in 1933, continues to spark arguments among academics and economists in especially as it explains the notion and influence of government revenue and expenditure on the economy. According to Keynesian theory, the government may affect macroeconomic productivity via fiscal policy by adjusting tax rates (revenue levels) and public expenditures (public expenditure).

It went on to say that the effect so generated by tinkering with those factors would, in turn, bring down inflation, boost employment, and keep prices low. In other words, he felt that a countercyclical measure would result from government interference in fiscal policy, and that a stable level of economic activity, with underemployment at equilibrium, would result from letting market forces take their course. They firmly think that governments may place themselves on a road to growth and development if they properly mix public finance and expenditure. It also implies that governments may achieve their economic goals by increasing revenue or spending [32].

In other words, if spending is raised as an example, productions and investments might be stimulated, resulting in economic activity that is visible in the form of job creation and greater revenue. Production also increases exports, which in turn decreases imports. As argued, within the Keynesian model, when government increases spending, it leads to a higher economic growth and vice versa. Similarly, when revenue is increased, expenditure should also increase at the same time otherwise a deficit situation could occur, putting the actualization of macroeconomic objectives in jeopardy [1]. The government achieves this goal through adjusting taxation and spending in order to maintain a balance between the effective demand for and supply of goods and services.

However, spending on expanding the productive sector of the economy is what's needed to stimulate this degree of economic stability. Untargeted expenditure will have no effect on the macroeconomy. With that said, this research relies on Keynesian theory since it agrees with the theory of public finance and the issues it raises (such as government revenue and economic growth) are underlined. This theory proposes that the key to achieving economic growth through

government spending and taxation is to implement policies that would allow the government to produce the necessary income for the nation.

3. Methodology

This study employed an after-the-fact research strategy. Examining past occurrences or data for potential causative variables is known as ex-post facto analysis, and it can be used to determine what factors are related to a certain

occurrence, circumstance, event, or behaviour [22]. For the most part, this inquiry relied on secondary sources for its information. The time period of the investigation was extended from 2011 to 2021 to guarantee the reliability of the empirical outcome. "Information was compiled from the World Bank Statistical Bulletin, the National Bureau of Statistics annual reports, and the websites of the Central Bank of Nigeria (CBN) and the Federal Inland Revenue Service (FIRS). The research's time-series data came from all of these secondary sources.

Table 1. Variable Definition and Measurements.

| Variable | Acronym | Type | Measurement and Source |
|-------------------------|---------|-------------|--|
| Economic Growth | ECG | Dependent | Natural log of all sectors Real gross domestic product (Ugochukwu & Oruta, 2021). |
| Oil Revenue Leakage | ORL | Independent | Natural log between the difference of total budgeted oil revenue and actual oil revenue (Ehiedu et al., 2022). |
| Non-Oil Revenue Leakage | NORL | Independent | Natural log between the difference of total budgeted tax revenue and actual tax revenue (Ehiedu et al., 2022). |
| Total Revenue Leakage | TRL | Independent | Natural log between the difference of total budgeted revenue and actual revenue (Ehiedu et al., 2022). |

Source: Extracted from Empirical Literature (2022).

Model Specification

Based on the variables definition and measurements as shown on table 1, the regression model of the study was specified as follows:

Economic Growth = f (Revenue Leakage)

$$ECG = f(ORL, NORL, TRL) \quad (1)$$

Econometric model:

$$ECG_t = \beta_0 + \beta_1 ORL_t + \beta_2 NORL_t + \beta_3 TRL_t + \mu_t \quad (2)$$

Where:

ECG = Economic Growth

ORL = Oil Revenue Leakage

NORL = Non-oil Revenue Leakage

TRL = Total Revenue Leakage

β_0 = Constant

$\beta_1 - \beta_3$ = Coefficient to be estimated

μ = Error term

t = time series

coefficients lower than 3, indicating that the data are essentially normally distributed. In addition, the data are normally distributed since the Jarque-Bera probabilities for these variables are larger" than 0.05.

Table 2. Descriptive Statistics.

| | ECG | NORL | ORL | TRL |
|--------------|-----------|-----------|-----------|-----------|
| Mean | 9.724858 | 5.249843 | 4.969133 | 6.142198 |
| Median | 9.718550 | 5.427970 | 5.113830 | 6.097240 |
| Maximum | 9.891070 | 6.348500 | 6.366610 | 7.518030 |
| Minimum | 9.519430 | 3.513950 | 1.802510 | 4.210340 |
| Std. Dev. | 0.094068 | 0.709371 | 1.060398 | 0.878708 |
| Skewness | -0.215655 | -0.213194 | -0.936995 | -0.392342 |
| Kurtosis | 2.475707 | 2.258041 | 3.547675 | 2.266278 |
| Jarque-Bera | 0.787391 | 1.251031 | 6.511799 | 1.971549 |
| Probability | 0.674559 | 0.534986 | 0.038546 | 0.373150 |
| Sum | 398.7192 | 215.2436 | 203.7345 | 251.8301 |
| Sum Sq. Dev. | 0.353949 | 20.12829 | 44.97775 | 30.88514 |
| Observations | 41 | 41 | 41 | 41 |

Source: E-views 10 results output, (2022).

4. Results and Discussion

The presentation of the descriptive statistics is shown in Table 2. Over a period of 11 years, the average ECG reading was 9.7249, with a standard deviation of 0.0094. Average values for NORL, ORL, and TRL were respectively 5.2498, 4.9691, and 1.0604, while the standard deviation for TRL was 0.8787. For each variable, the standard deviation is less than the mean, indicating that the data is not extremely distributed.

With a kurtosis equal to three, the normal distribution has no thick or skinny tails. Therefore, if the kurtosis of an observed distribution is more than three, it has heavy tails relative to the normal distribution. Most of the variables in Table 2 (with the exception of ORL) have kurtosis

4.1. Augmented Dickey-Fuller (ADF) Unit Root Test

Given its status as the de facto standard for determining whether or not a time series is stationary, this research employed the Augmented Dickey-Fuller (ADF) (1979) test. Testing for the presence of unit roots is a fundamental problem in the study of time series models and cointegration. By removing the possibility of false regression, which frequently arises when working with time series data, this test should be useful. Time series data with a unit root suggests a non-stationary stochastic process, whereas data without a unit root imply a stationary stochastic process. If the value of the ADF is below the critical value, then the time series is not stationary, and vice versa. The ADF is used to assess the lack of a unit root in a sample of time series. Alternatively, when

the ADF value is larger than its critical value, the underlying time series is stationary.

Table 3. Summary of Augmented Dickey-Fuller (ADF) Unit Root Test.

| ADF TEST @ Level | | | | | |
|-------------------------|---------------------------|-------------------------------|----------------------|---------|----------------|
| Test Variables | ADF Test Statistics Value | Mackinnon Critical Value @ 5% | Order of Integration | P-value | Decision |
| ECG | -4.159085 | -2.938987 | I(0) | 0.0023 | Stationary |
| ORL | -3.269103 | -2.933158 | I(0) | 0.0228 | Stationary |
| NORL | -2.181191 | -2.933158 | I(0) | 0.2159 | Non-Stationary |
| TRL | -2.199789 | -2.933158 | I(0) | 0.2094 | Non-Stationary |
| ADF TEST @ 1 Difference | | | | | |
| Test Variables | ADF Test Statistics Value | Mackinnon Critical Value @ 5% | Order of Integration | P-value | Decision |
| ECG | -12.77683 | -2.941145 | I(1) | 0.0000 | Stationary |
| ORL | -6.625008 | -2.935001 | I(1) | 0.0000 | Stationary |
| NORL | -8.138658 | -2.935001 | I(1) | 0.0000 | Stationary |
| TRL | -6.137218 | -2.935001 | I(1) | 0.0000 | Stationary |

Source: E-views 10 results output, (2022).

Table 3 summarizes the results of the ADF unit root test, which showed that the ECG and ORL are stationary but the NORL and TRL are not stationary at Level. Consequently, verifying stationarity at first difference is essential. The initial difference analysis showed that all of the variables are stationary. This is demonstrated by the fact that their individual ADF numbers are more than the 5% cutoff limit.

Further supporting evidence of stationary series is provided by the fact that the p-values for all variables are less than the level of significance greater than 95% confidence level. They all became stationary at the first difference, or order one. Since all of the variables are integrated at order one, it is necessary to do the Johansen cointegration test.

Table 4. Johansen Cointegration Test.

| Hypothesized | Eigenvalue | Trace Statistics | 0.05 | Prob** | Max-Eigen Statistics | 0.05 Critical Value | Prob** |
|--------------|------------|------------------|----------------|--------|----------------------|---------------------|--------|
| No. of CE(s) | | | Critical Value | | | | |
| None* | 0.649701 | 62.01583 | 47.85613 | 0.0014 | 40.90974 | 27.58434 | 0.0006 |
| At most 1 | 0.259007 | 21.10609 | 29.79707 | 0.3511 | 11.69078 | 21.13162 | 0.5784 |
| At most 2 | 0.165399 | 9.415307 | 15.49471 | 0.3284 | 7.051282 | 14.26460 | 0.4831 |
| At most 3 | 0.058815 | 2.364025 | 3.841466 | 0.1242 | 2.364025 | 3.841466 | 0.1242 |

Source: E-views 10 results output, (2022).

The number of hypothesized cointegrating equations is displayed in Table 4 using the Johansen Cointegration Test. At the value of "None," the findings show that at least one cointegrating equation exists. Specifically, the corresponding ADF data have a value higher than the cutoff value of 5%, proving this to be the case. Moreover, the series is steady at the 95% confidence level, with a p-value of less than 5% threshold of significance. At the first difference, or order one, they all" became stationary. Because order one integration is true for all variables.

Table 5. Correlation Matrix.

| Variables | ECG | NORL | ORL | TRL |
|-----------|----------|----------|----------|----------|
| ECG | 1.000000 | | | |
| | ----- | | | |
| NORL | 0.991606 | 1.000000 | | |
| | 0.0000 | ----- | | |
| ORL | 0.978043 | 0.967046 | 1.000000 | |
| | 0.0000 | 0.0000 | ----- | |
| TRL | 0.990356 | 0.989022 | 0.971449 | 1.000000 |
| | 0.0000 | 0.0000 | 0.0000 | ----- |

Source: E-views 10 results output, (2022).

The direction and degree of the relationship between

independent variable proxies and economic expansion are displayed in the correlation matrix. There was a high degree of correlation between the NORL, ORL, and TRL coefficients. There is multicollinearity when the correlation coefficient" is greater than 0.7. This necessitates a check for multicollinearity.

4.2. Multicollinearity

"Since the data for the study are annual time series, the multicollinearity test was conducted to ascertain if the data contained multicollinearity, this is presented in table 6.

Table 6. Multicollinearity Test.

| | Coefficient | Uncentered | Centered |
|----------|-------------|------------|----------|
| Variable | Variance | VIF | VIF |
| C | 0.019937 | 101.2199 | NA |
| ORL | 0.000185 | 24.28130 | 1.032871 |
| NORL | 0.000493 | 70.27439 | 1.229871 |
| TRL | 0.000321 | 62.63521 | 1.226169 |

Source: E-views 10 results output, (2022).

One way to check for multicollinearity among independent variables is via the variance inflation factor (VIF). Accordingly, all of the independent variables have

centred VIFs that are less than 10 but more than 1. It demonstrates that the independent variables are not

correlated with one another. Therefore, there is no problem with multicollinearity.

Table 7. Multiple Regression Analysis.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---------------------|-------------|-----------------------|-------------|-----------|
| C | 9.550337 | 0.141197 | 67.63821 | 0.0000 |
| ORL | -0.016377 | 0.013618 | -1.202602 | 0.2368 |
| NORL | 0.039723 | 0.022213 | 1.788265 | 0.0819 |
| TRL | 0.007711 | 0.017905 | 0.430630 | 0.6692 |
| R-squared | 0.155826 | Mean dependent var | | 9.724858 |
| Adjusted R-squared | 0.087380 | S. D. dependent var | | 0.094068 |
| S. E. of regression | 0.089864 | Akaike info criterion | | -1.888572 |
| Sum squared resid | 0.298794 | Schwarz criterion | | -1.721395 |
| Log likelihood | 42.71573 | Hannan-Quinn criter. | | -1.827695 |
| F-statistic | 2.276616 | Durbin-Watson stat | | 1.373019 |
| Prob (F-statistic) | 0.095759 | | | |

Source: E-views 10 results output, (2022).

Table 7 displays the results of a multiple regression analysis; the coefficient of ORL has a value of -0.0164, the t-value is -1.2026, and the p-value (sig. value) is 0.2368. Thus, it appears that TEAOR has a small, negative impact on ECG. The p-value of 0.2368 is bigger than the 5% threshold for significance, hence this link is not significant. With a coefficient of 0.0397, NORL is positively correlated with ECG. The ECG would go up by 3.9% for every 1% change in NORL. This agrees with the results of [3]. The coefficient of TRL is 0.0077 with a t-value of 1.7883 and a p-value (sig. value) of 0.6692, as shown in Table 7 of the multiple regression findings. As a result, it appears that TRL are advantageous.

The study's findings indicated a negative association between oil revenue leakage and economic growth. Which implies that if oil revenue were to leak at a greater rate, economic growth would slow. Revenues that aren't from oil sales end up leaking out, though, and that helps the economy expand. It is hypothesized that if non-oil revenue were to leak out at a greater rate, the economy would expand. In contrast to what the scientist had predicted, this is unexpected. The resource curse theory, which suggests that a country's inability to diversify its economy away from oil" would have negative consequences, provides an explanation.

5. Conclusion and Recommendations

This research analysed "the impact of tax leakages on Nigeria's Economic growth from 2011 to 2021. This was carried out in line with Oil Revenue Leakage (ORL), Non-oil Revenue Leakage (NORL), and Total Revenue Leakage (TRL) metrics, as well as the impact these metrics have on Nigeria's economy as measured by Real Gross Domestic Product (RGDP). Information for the years 2011-2020 was compiled from the World Bank Statistical Bulletin and the National Bureau of Statistics of the United States of America. Descriptive statistics were utilized to characterize the dataset for regression, and the unit root test was used to ensure data stationarity. Both the correlation analysis and the Multiple Regression analysis, conducted in E-VIEW version 10.0,

were utilized to test the study hypotheses by determining the extent to which independent variables moved in tandem with the dependent variable of interest.

The study found that while Oil Revenue Leakage (ORL) had a negative influence on economic development, it was not statistically significant, non-oil revenue leakage (NORL) had a beneficial effect. So, the study found conflicting results about the relationship between revenue leaks and GDP expansion in Nigeria. Therefore, the paper proposes that the government should create job possibilities for everybody through the prudent use of tax resources, therefore promoting a high percentage of tax compliance and lowering the dual challenges of tax evasion and avoidance to a" manageable level.

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