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Asesssing the Impact of Value Added Tax (Vat) Gaps on Vat Revenue Generation in Nigeria

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Abstract: The study was aimed to examine the impact of Value Added Tax Revenue (VAT) Gaps on VAT Revenue Generation in Nigeria. Initially the study intended to use bottom-top approach, but the idea was later on discarded due to the problems of data availability and reliability, therefore time series data from 2010 to 2018 was used. Descriptive statistics were employed to compute VAT Policy Gap, VAT Compliance Gap and C-Efficiency Ratio for all the relevant years. Auto Regressive Distributed Lag (ARDL) Model and Vector Error Correction Model (VECM) were used to examine the impact of the independent variables on VAT Revenue. The short run empirical result revealed a positive relationship between previous Value Added Tax Revenue, Aggregate Consumption and the dependent variable (Value Added Tax Revenue). Similarly VAT Policy Gap and VAT Compliance Gap have a negative relationship with the dependent variable. However Cointegration Bounds Test revealed a long run relationship among the variables, and a long run model was run. The long run empirical result found a positive relationship between the dependent variable and Aggregate Consumption, while VAT Policy Gap and VAT Compliance Gap have a negative relationship with the dependent variable, but the impact of Aggregate Consumption on VAT Revenue both in the short and long run were statistically insignificant. Error Correction Term obtained confirmed that the model can correct it previous disequilibrium at the rate of 29.04 percent per quarter. Finally the study recommends that the Revenue Authority in charge of VAT in Nigeria, should liaise with the States and Local Revenue Authorities, so as to put additional efforts to increase VAT compliance level to at least 70%, from the 28% in 2018..Even though the study realised that the country VAT rate is the lowest in the West African Sub region, still the relevant stake holders should adequately take compliance factors into consideration, before making any increase in the VAT rate; because increasing VAT rate in an economic environment associated with low tax compliance rate, may lead to an increase in the team of VAT evaders and consequently falls in the tax revenue.

Key words: Value Added Tax, VAT GAP, VAT Policy Gap, VAT Compliance Gap, Laffer curve, Autoregressive Distributed Lag, Consumption
JEL Classifications: C32, D11, D12, E21, H21, H27, H31

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I. INTRODUCTION

Tax system is not only an important instrument for generating revenue to the government; but also a tool of national economic policy. Taxation arrangements can be used to redistribute income, correct markets failure, encourage consumption of merit goods, discourage consumption of demerit goods, and internalize externalities. At macro level taxation can be applied to bring desirable macro-economic effects (such as full employment, price stability and balance of payment equilibrium) and avoid undesirable macro-economic effects (such as inflation, unemployment etc.) in an economy. An efficient tax system ensures intergenerational equity, by forcing present generation to pay for non-durable public product consumed, without passing the burden to the next generation. Globally there is a shift from direct taxes to indirect taxes as a means for generating government revenue, indirect taxes was favoured due to its convenience and low resistance. Many countries embraces Value Added Tax (VAT) as the principal means for generating government revenue. According to Gerald and Naritomi (2018), Value Added Taxes (VAT) exist in more than 160 countries, including many developing countries that have modernised their tax systems in the past decades. Similarly, Keen (2016), affirmed the importance of VAT as a tool of generating tax revenue in developing countries as he said, eighty percent of countries in sub-Saharan Africa have adopted the VAT, and it is now responsible for raising around one-quarter of all tax revenue .

Though VAT gains lot of popularity among politicians and policy makers, but yet like any other tax type it has been characterised by many issues, which led to the existence of gap between potential VAT Revenue of an economy and the actual VAT revenue generated by the economy, within a particular accounting period. The existence of a VAT gap in an economy becomes a source of worries to politicians who have been striving to retain their offices by delivering electoral promises and policy makers who were saddled with the responsibility of making appropriate policies that will ensure maximum tax revenue collection. In this regard Shahini and Malaj (2015), said that a tax system consists of a set of taxes, but in all countries the VAT is the main item and low level of tax collection leads to the inability to reduce the state deficit in the current period and debt in the long run. Also low level of tax collection mean less public investment, less expansion of private businesses, less employment and therefore less economic growth. Warren and McManus (2007), said that to make your fight successful you need to know your enemy. Estimation of the extent of tax fraud and tax evasion as well as identifying the main causes or loopholes in a tax system which enable people to evade, is therefore crucial for the development of an appropriate tax policy.

According to Nerudova and Dobransch (2019), Tax gap measurement is worthwhile policy wise because it could provide essential information for a better understanding of tax compliance and its implications on tax policy. Moreover, tax gap estimation provides clues regarding a tax agency's efficiency in collecting tax revenues and the needed resource allocation in order to address tax gap occurrence.Precise determination of VAT gap is a fundamental step in assessing the VAT efficiency and uncovering the true size of tax evasion and tax avoidance. The accuracy of the VAT gap represents a major issue for tax compliance analysis. The VAT gap is also critical for shaping policymakers' strategy regarding the needed reforms to decrease tax evasion and tax avoidance. Moreover CSERCB (2013), affirmed the importance of studying VAT Gap, because it helps to assess informal economy, tax consciousness of citizens and tax morale Zidkova (2014), said that Quantifying and analysing VAT gaps has become important issue for tax administrations in the European Union in recent years due to increasing tax evasion and tax fraud with respect to VAT. He (2014), further said that VAT gap study is useful in realizing the size and trend of potential VAT evasion. Furthermore, the higher VAT gap could also arise when the tax authorities do not work efficiently. Therefore, the VAT gap is sometimes also used as a measure of the effectiveness of tax collection by the financial authorities, which is not affected by economic changes or changes to VAT rates. The growing size of VAT gap may indicate either a VAT evasion or a low effectiveness of tax collection or both together.Hutton (2017) posited that Tax gap analysis provides tax administrators and policy makers, and their stakeholders, with a measure of the amount of tax revenues lost through noncompliance, avoidance, and the impact of policy choices.Murphy (2014), contented that the size of the tax gap has a direct impact on government spending policy. A high tax gap increases the public deficit and decreases the supply of public goods and services, which affects the quality of life and the well-being of those individuals who depend on public services; to him three factors constitute tax gap: tax debt (those revenues which their payments were delayed), tax avoidance and tax evasion (illegal and deliberate actions of taxpayers which fail to declare their taxable income and claim undeserved tax deductions). Similarly,Raczkowski (2018), said tax gap is part and parcel of any economy, to a larger or a smaller extent, the shadow economy operates in every country, flourishing because of tax evasion and persistent practices of aggressive tax optimization.

The role that a competent, efficient and transparent tax administration can play for combating tax evasion, reducing tax gap and increasing tax compliance in an economy can never be over emphasized. According to CASE report's (2018), a competent tax administration can promote tax compliance by preventing of tax fraud in advance (ex-ante control), and reducing its existence, by means of the efforts of tax inspectors in discovering it (ex-post control). Therefore tax administration makes both ex-ante and ex-post efforts to promote voluntary tax compliance in an economy. O'Doherty (2014), asserted thattax administration of a given country can play an important role, which may work efficiently by way of supporting the processes of formulation of the tax and economic policies as well as risk analyses, tax audits or operational controls over business activity. Moreover,Cobham et al., (2015), said that the Tax Gap itself may emerge and develop, if there are mechanisms allowing this to happen. Such mechanisms are created in a given country by the government, by criminal organizations or by entrepreneurs. They may be created by way of mutual cooperation between corrupted government officials and criminals, the government officials and entrepreneurs, or entrepreneurs and criminals or among the corrupted government's representatives, entrepreneurs and criminals simultaneously. Shahini and Malaj (2015), said that tax system is one of the most important fiscal policies of a country. Its primary objective is to ensure the collection of tax revenues based on administrative regulations and to improve based on legislative system. It is especially important to make coordination between administrative and legislative systems because a very good tax legislation, if not accompanied by proper applicability of the administrative system it may lead to an unsatisfactory efficiency. Likewise if legislation leaves room for the possibility of abuse by administrative system it would have an unsatisfactory efficiency too. Bird (2004), argued that even the best tax policy in the world would worth little if its implementation was far from effective. In this respect, the yield, incidence, and efficiency of a tax system may depend on how it is administered.

The ability of Nigerian government to use VAT revenue to finance developmental project has been challenged by low VAT revenue, according to the country's Minister of Finance Ahmed, (2019) "Our VAT revenue to GDP ratio stands at less than 1% (0.8%), which compares unfavourably to the ECOWAS average of 3.4%, this makes the minister to announced government plan of the possibility to increase VAT rate in the country; and on the 11th of September 2019, the Minister of Finance announced the government proposed plan to increase the VAT rate by 50% from the standard 5% to 7.5% This revelation caused public outcry from tax experts, general public and politicians, who says that the low VAT revenue was caused by weak tax administration, which tolerate VAT evasion that create a huge VAT gap in the country. For instance IMF chief representative in Nigeria Mati (2018), Said that there was a lot of leakage in the country tax system; compliance in Nigeria is very low, about 20 to 25 percent; if you were to double compliance to 50-60 percent, you would double VAT collection. This study opined that, at any time and in any place, tax policy deals with two basic issues, that is the rate and base of every tax type. Government may decide to increase or decrease the rate of VAT (decision related to the rate) or to exempts some items from paying the VAT (decision related to the base); any decision taken may have implication on tax compliance level and consequently tax revenue generation.

Similarly IMF report on Nigeria (2018), affirmed the negative impact of low tax revenue on the country's economy, the report revealed that low non-oil revenue mobilization is affecting the government's objectives to expand growth-enhancing expenditure priorities, foster higher growth and employment, and comply with its fiscal rule which limits the federal government deficit to no more than 3 percent of GDP. There is significant revenue potential from structural tax measures. A broad-based and comprehensive tax reform program is needed in the short and medium term to address these objectives and generate sustainable revenue growth by broadening the bases of income and consumption taxes, closing loopholes and leakage created by corporate tax holidays and the widespread use of other associated tax expenditures, as well as creating incentives for the sub-national tiers of government to raise their own source revenues. The Funds further revealed that very low tax collection rates in Nigeria are a direct reflection of weaknesses in revenue administration systems and a high level of systemic noncompliance. Despite successful initiatives to bring in a significant number of new corporate and self-employed individuals (over 530,000 new corporate registrations were made during the first quarter of 2016—a 67 percent increase), these efforts have not delivered expected revenue.

This study was motivated by the issue of Low VAT Revenue to GDP ratio, aspiration of government to increase the VAT rate with a view to improve the ratio, and the expert assertions of the existence of VAT Gap due policy and administration lapses. The study have these questions in mind: whether the size of the VAT Gap is statistically significant enough to influence VAT Revenue? And whether the government can improve VAT Revenue Collection without increasing the VAT rate?

The aim of this paper is to empirically examine the Size of Value Added Tax Gap in Nigeria, both compliance and policy Gap, and to assess the Impact of the Gaps on VAT revenue. The study will attempt to assess from empirical evidence if there room for the revenue authorities to enhance VAT revenue collection without increasing the rate.

II. Literature Review

2.1 Conceptual Literature Review

2.1.1 Concept of Value Added Tax (VAT)

Though the tax is called Value Added Tax, but VAT is not a tax on Value Added, it is a consumption tax collected at each stage where value is added or created.. Usman (2019) said that the VAT is chargeable on the nominal value of the value added, in real sense, the value of the product may be less than it original cost due to inflation, but still VAT is chargeable.

Kagan (2019), VAT is a consumption tax placed on product whenever value is added at each stage of the supply chain, from production to the point of final sale. The amount of VAT that the user pays is on the cost of the product, less any of the costs of material used in the product that have already been taxed.

2.1.2 Concept of (VAT) Exemption and Zero Rated

European Commission on Taxation and Custom Union (2016), defined VAT exemption as a supply of goods and services that no VAT is applied to it, whether at final stage of sale to the consumer or at some intermediate business to business stage. The goods and service exempt mostly are certain activities that are for public interest. Some exempt transactions are called "zero rated" transactions as the result there is no residual VAT in the final price.

Keen and Smith (2007), defined VAT exemption as a situation where no tax is due on output and no refund available for any input VAT already paid. While zero rating means that VAT is levied at a rate of zero percent: no tax is due on output, but a refund isstill available for input VAT. Usman (2019), added that some goods and services were exempted due to the general perception of VAT as a regressive tax, because it is

proportional to consumption and poor household relatively spends more percentage of their income on consumption. Therefore VAT exemptions for education, health and basic foods are meant to minimise the impact of the inequality that may arise.

2.1.3 Nigerian Value Added Tax (VAT)

VAT was introduced in Nigeria on the 1st of December, 1993, according the provisions of section 2 of the VAT Act, the tax is applicable on all goods and services, except those listed on the first schedule of the Act. Section 4 of the Act said that the tax is chargeable at the rate of 5 and zero percent.

The goods and services exempted from the tax based on the provisions of the First Schedule of the Act are: All medical and pharmaceutical products, Basic food items, Books and educational materials, Baby products, Fertilizer, locally produced agricultural and veterinary medicine, farming machinery and farming transportation equipment, all exports, Plant, machinery and goods imported for use in the export processing zone or free trade zone)Provided that 100 percent production of such company is for export otherwise tax shall accrue proportionately on the profits of the company),Plant, machinery and equipment purchased for utilisation of gas in down-stream petroleum operations, Tractors, ploughs and agricultural equipment and implements purchased for agricultural purposes, Medical services. Services rendered by Community Banks, People's Bank and mortgage Institutions, Plays and performances conducted by educational institutions as part of learning, All exported services.

While those listed as zero rated are: Non-oil exports, Goods and services purchased by diplomats. Goods purchased for use in humanitarian donor funded projects (humanitarian donor funded projects" includes projects undertaken by Non-Governmental Organisations and religious and social clubs or societies recognised by law whose activity is not for profit and in the public interest.)

The provisions of section 40 of the Act, shared the VAT Revenue proceeds among Federal, State and Local Government(s) in the ratio of 15%, 50% and 35 % respectively, and the principle of derivation of not less than 20% shall be reflected in the distribution of the allocation amongst States and Local Governments.

2.1.4 Concept of VAT Gap

Conikalp, Unlukapan, and Celik, (2016), defined VAT Gap as the difference between potential collectable tax revenue, and the amount that was actually collected. This study views VAT Gap as the difference between VAT revenue an economy ought to have collected in a perfectly tax compliant environment without policy defect or restriction and actual VAT revenue collected in a particular accounting Period. Though there is an almost consensus among public finance expert on the concept of VAT Gap, but there are divergent views on what actually cause the Gap in an Economy. Generally VAT gap may be caused by many factors such as tax laws of an economy, competency and integrity of tax administrator, corruption level in an economy, nature of the economy and public perception on the political system.

2.1.5 Types of VAT Gap

Hutton (2017) said that the VAT gap can be decomposed into two main components: the impact of noncompliance (compliance gap), and the impact of policy choices (policy gap).But the two gaps were not completely independent, one gap may influence the other. For exampleCASE Report's (2013), revealed that policy and compliance gaps for VAT are not independent elements. The VAT gap produced by policy gaps, such as a reduced VAT rates regime, exemptions or thresholds of the VAT, make tax compliance more difficult and increase the efforts to determine the exact VAT liability. This study also observed that policy gap, accommodate VAT avoidance and evasion.

VAT Policy Gap

While Policy Gap is a type of VAT Gap caused by tax law of a country due to differentiation in tax rate and VAT exemptions. Nerudova and Dobransch (2019), defined the policy gap as the difference between the actual VAT revenues and the theoretical VAT revenues that would be collected if a country imposed a standard VAT rate on all goods and services.

CASE Report's (2013), decomposes policy gap into two main components, that is the rate gap and the exemption gap. The VAT rate gap is assumed to occur due to losses of VAT revenues when an economy imposed reduced rates or zero rated on selected goods and services and the VAT exemption gap represents those VAT revenues lost to a VAT exemption granted by an economy. In a similar fashionKeen (2013), divides policy gap into two: First is rate differentiation gap, which include imposing lower VAT tax rates than the standard VAT rate or zero tax rate for the essential goods and services, while the second is exemption gap, which include exempting specified goods and services from the taxation.

This study takes monetary value of goods and services exempted less export multiply by standard tax rate as the proxy of VAT policy Gap in Nigeria. Export was excluded mainly because it is not part of final domestic consumption.

VAT Compliance Gap

Conikalp, et al (2016), defined Compliance gap as the difference between the amount that the taxpayer should pay on an ideal basis and the actual tax payment. The gap is usually caused by the taxpayer's application to tax loopholes or tax evasion. Tax evasion and incomplete statements leads to collecting tax revenue under the amount envisaged in the law and leads to the compliance tax gap. Similarly Thackray and Ueda (2014), examine compliance gap under two different concepts: Allocation gap and base tax gap. Allocation gap is measured by audits, investigation of base taxgap. Allocationgapis calculated by comparing potential tax payments with a total value of tax revenue. Tax base gap is also called "unexplained gap" which was defined as the difference between total compliance gap and allocation gap. Similarly Lakuma and Sserunjogi (2018), defined VATcompliance gap is the difference between actual revenues collected and the potential revenues that could have been collected given the policy framework that was in place during that year. In principle this can be split into the collections gap, the amount of declared and assessed tax not collected; and the assessment gap, the amount of tax due that was not declared or assessed.

This study takes VAT compliance gap as the total VAT gap less VAT policy gap in any particular accounting year.

2.1.6 Method of Estimating VAT Gap

Reckon (2009), said there are two main methods for calculating the VAT gap in an Economy. The methods are Micro (direct) Method which is called Bottom-Top Approach and Macro (indirect) Method which is also called Top-Down Approach

Micro Method (Bottom-Top Approach)

According to Zidkova (2014), under Micro method the theoretical liability is derived by computing data relating to individual and companies to discover fraud. This method usually collects data from surveys and tax audits. Zidkova (2014), further said that the method was used by US Internal Revenue Service, British and Swedish Tax Authorities to estimate VAT Gap; to him the method is usually not used by scholars, as they cannot obtain the relevant information.

Micro Method estimate VAT gap by collecting information from individual tax payers through tax audit or survey, and then make a generalization. Similarly, Hutton (2017), said that Bottom-up techniques involves procedures such as random sampling of taxpayers for audit, or compliance risk analysis and intervention results can also be used to estimate the impact of specific behaviors. The method can provide valuable insights into compliance behaviors and associated risks. Some of the limitation of the method is that it only covers and identify specific source of a VAT gap, not necessarily the whole, and it is costlier to execute than a top-down approach. According to Hanousek and Palda (2002), the main advantage of surveying people is the richness of demographic data, which they are able to identify what groups of people evade the VAT most.

Macro Method (Top-Down Approach)

This method rely on macroeconomic data from national accounts to quantify the theoretical VAT liability for the whole economy, and compare it with the actual VAT receipts by the tax administration in a particular accounting period. This study defined theoretical VAT Liability as the final household consumption multiply by the standard VAT rates (which is 5% in Nigeria). Hutton (2017), said that a top-down approach aims to provide a comprehensive assessment of all tax losses by measuring the gap as the difference between estimated potential revenue and actual revenues. The estimates for potential revenue are typically produced using statistical data. This approach does not identify the compliance behaviors creating the losses.

The main problem of this approach is that it relies on taxable economic activities captured in National Statistics, but there are some taxable consumptions that cannot be captured by National Statistics due to their illegality or due to the existence of underground or shadow economy; these problems may render the gap to be smaller than its actual size. Yet this study felt that the top-down approach can provide reasonable results on macroeconomic level, if a consideration was given to the existence and zero rating that cannot be readily captured by National Statistics, this may offset the negative impact of a shadow economy and unreported illegal economic activities.

2.1.7 Method of Estimating VAT Efficiency

Aizenman and Jinjarak (2008), identified two principal method for measuring VAT revenue performance of an economy, they are:C-efficiency ratio (which is the ratio of the VAT revenue to aggregate

consumption, divided by the standard VAT rate) and Efficiency ratio (which is the ratio of VAT revenue to GDP, divided by the standard VAT rate. The ratios ranges between zeros to one inclusively, the higher the ratio, the higher the collection efficiency of the VAT system of a country.

C-efficiency ratio was generally considered superior, because VAT is a consumption tax therefore taking the ratio using GDP will usually make the ratio lower than the real ratio, and C-efficiency ratio use final consumption multiply by standard VAT rate as the denominator. Similarly Ueda (2017), said the C-efficiency ratio is the most commonly used indicator for evaluating the revenue performance and overall efficiency of the VAT system. It is simply the ratio of actual revenues to theoretical revenues from a perfectly enforced tax environment, where the tax is levied at a uniform rate on all consumption. It also has the advantage of requiring small data sets.

2.2 Review of Empirical Literature

Nerudova and Dobransch (2019), conducted a research to determine Value Added Tax (VAT) Gap in European Union using a nontraditional analytical method. The study sourced data from CASE Study reports of 2013, 2014, 2015 and 2017. The study employed the Stochastic Tax Frontier Model (STFM) to analyse the variables, where VAT Total Liability(VTTL) was used as the input to estimate the optimal frontier of the VAT, as well as to predict technical inefficiency. The impact of exogenous factors (such as corruption, political environment) on the technical inefficiency of the VAT was measured. Among the main findings of the empirical result are: The most efficient country in terms of VAT revenues is Sweden with a VAT gap of only 1.17% compared to CASE results of 3.52% of VTTL. At the opposite end stands Romania, which has the highest STFM-estimated VAT gap of 36.68%, still smaller than the CASE average of 40.28% of VTTL. The other less efficient EU countries that have a high VAT gap are Lithuania with 29.47%, Slovakia with 25.25%, Greece with 24.25%, Malta with 21.52%, Latvia with 20.26% and Italy with 19.74%. The western group of EU countries proves to be more efficient in terms of VAT gap; the smallest averages are had in the Netherlands with 1.89%, Denmark with 2.34%, and Germany with 3.16%, and Austria with 4.19% and Finland with 4.05%. From the eastern group of EU countries, the smallest STFM-estimated VAT gap is in Slovenia, with only 4.13% of the optimal frontier. The results under the STFM appear to be significantly lower than the results obtained through the top-down method used by the CASE reports. The only close match regarding the size of VAT gap between the STFM and a top-down method is Malta. Overall, there is a difference of more than 5% between the average VAT gap for the 26 EU countries obtained by the STFM and those reported by CASE reports. Owoni (2019), carried on a study to empirically examine the impact of Value Added Tax (VAT) Revenue on the economic growth of Kenya. Time series data for the period 1973 to 2010 was utilised. The study employed the Ordinary Least Square (OLS) technique to estimate the model. The empirical result found a positive but statistically insignificant relationship between VAT Revenue and economic growth in Kenya. The study concluded that the impact of VAT on the economy is not statistically significant enough to influence the economic growth in Kenya, due to some problems such (Such as VAT gap), that are affecting the potentials of the country VAT system.

Lakuma and Sserunjogi (2018), carried on a study to analyze Value Added Tax gap in Uganda, using a top down approach. The empirical study makes the following findings: The compliance gap is estimated to be between 39 percent and 30 percent of potential VAT revenues during the period 2009/10–2016/17, and peaking in 2010/11. The estimated gap is higher than the typically observed levels in Sub Saharan countries and near to the levels in Latin American countries. The estimated compliance gap increased to 64 percent of the potential VAT revenue in 2010/11.The VAT policy gap and the part of the gap explained by the policy gap due to tax expenditures such as exemptions and reduced rates is lower than the VAT compliance gap in Uganda.The VAT c-efficiency ratio in Uganda has been in an increasing trend from 25.9 percent in 2009/10 to 31.9 percent in 2016/17 due to the decrease of both compliance and policy gap.

Malik, Mihm and Timme (2018), conducted a laboratory experiment with a view to analyze the impact of Anti-Avoidance Tax Rules on overall tax compliance. The study employed statistical techniques to analyse the data. The empirical result found that the adoption of Anti-Avoidance Tax Rules to increase tax compliance leads to a substitution effect between tax avoidance and tax evasion. While Anti-Avoidance Tax Rules do achieve some reduction in tax avoidance, and tax evasion tends to increase in that regards. The result further said that the substitution effect does decrease the effectiveness of Anti-Avoidance Tax Rules in lowering the tax gap. Even if Anti-Avoidance Tax Rules decrease aggressive tax planning practices, the potential increase in tax revenues is offset by the increase in tax evasion as a response to Anti-Avoidance Tax Rules introduction.

A study was conducted by Houssa, Megersa and, Nikiema, (2017), with a view to analyze the performance of the Value-Added Tax (VAT) in Benin and Burkina Faso. The study analyze the sources of VAT gaps using data on the activities of twenty key sectors in each country (based on national input-output tables) over the 1999-2014 period. The empirical result revealed that Benin's VAT gap is mainly explained by inefficiencies in the following sectors: agriculture, sales, agro-food industries, transport, post offices,

telecommunication, construction, public administration and other service sectors (including accommodation and restaurants).In Burkina Faso, the study found similar sectorial contributions to VAT gap but public administration plays a much dominant role as compared to Benin. The study also found that compliance gap is increasing overtime in Burkina Faso and in recent years explains a larger part of the overall VAT gap, there is a reverse trend in Benin, and that the sectorial sources of VAT gap are similar in the two countries.Zidkova and Pavel (2017), carried on a study to determine possible factors influencing the value added tax (VAT) gap in EU countries. Panel data from 2000 to 2011 were utilized and 21 variables were considered. Panel regression and pooled regression models were used to analyze the impact of the variables on VAT gap in EU countries. From 21 variables, only four proved to be statistically significant. The result revealed that the increase in the ratio of VAT revenues to GDP causes a reduction in the VAT gap. Further findings were that if the standard VAT rate and the difference between the standard and reduced VAT rate are increasing, the VAT gap grows. Finally, the control variable – share of household consumption in GDP is increasing the VAT gap. The study focuses mainly on the causes of VAT rather than the impact of the gap on VAT revenue.

Conikalp, Unlukapan, and Celik, (2016), conducted a study to estimate Value Added Tax gap in Turkey. Top down approach was utilized to estimate VAT Gap in Turkey from 2000 to 2013.The study makes the following revelations: Policy gap is greater than the compliance gap in all the periods, state forgone tax collections resulted from exemptions, deductions and rate differentiations are greater than the loss caused by the informal economy. Increasing VAT rate to 17% caused a rise in policy gap.Another study was conducted by D'agosto, Marigliani and Pisani (2014), to determine factors influencing the VAT gap in 20 regions of Italy, for the period 2007 to 2010. Indirect Top down approach was applied and panel regression model was used to analyse the variables. The explanatory variables public administration are: (as value added in public sector), activities of revenue agency (e.g. tax assessed during tax audits), social and economic condition of the area (e.g. number of thefts, murders) and finally the spending capacity of households and firms (e.g. amount of bank deposits and energy consumption). The empirical result obtained revealed that between 2007 and 2010 VAT Gap was almost 231 billion Euro, which account for 77% of household final uses and 23% for enterprises final uses. The result further found out that VAT gap is positively correlated with: economic condition, the business cycle and tax moral of a region.

Stavjaňová (2014), conducted a study to estimate the level of tax evasion of value added tax in the Czech Republic during 2006–2012. The study used Top-down approach to estimate the VAT gap. The result obtained showed that the VAT gap in the Czech Republic gradually increased during the observed period and it is more than CZK 100 billion in the last three years. The most significant growth of VAT gap occurred between the years 2007 and 2008 and between 2011 and 2012 when the reduced VAT rate was increased by 4 percentage points. Zidkova (2014), carried on a study to perform a regression analysis of potential variables explaining the VAT gap in 24 EU Member States in two selected years (2002 and 2006). The study utilised two alternative models based on cross-country OLS regression in the years 2002 and 2006. Theeconometric methods used are based on Wooldridge (2002). In the first model, the dependent variable in the analysis will be the relative VAT gap. The explanatory variables will also be entered in relative form to keep their variability at a reasonable level. The second model will explore the elasticity of the relationship between the VAT GAP and the explanatory variables. The empirical result obtained makes the following revelation: final consumption of households and non-profit organizations in each state has a positive impact on the VAT gap, and share of VAT in GDP has a negative impact on the VAT gap. Other identified variables that possess statistical significant impact on the size of the VAT gap were the share of the shadow economy and the standard VAT rate, with a positive impact, and GDP per capita, the share in intercommunity trade, final consumption of restaurant and hotel services, and the number of VAT rates, having a negative impact on the VAT gap.Barbone, Bird, and Vázquez-Caro (2012), carried on a study to examine the relationship between VAT evasion and the administrative cost of VAT compliance in EU member countries. The study relied on secondary data, and econometric model was employed to analyse the variables. The empirical result obtained revealed a statistical significant correlation between the tax gap in the EU Member States and VAT administrative costs.

III. METHODOLOGY

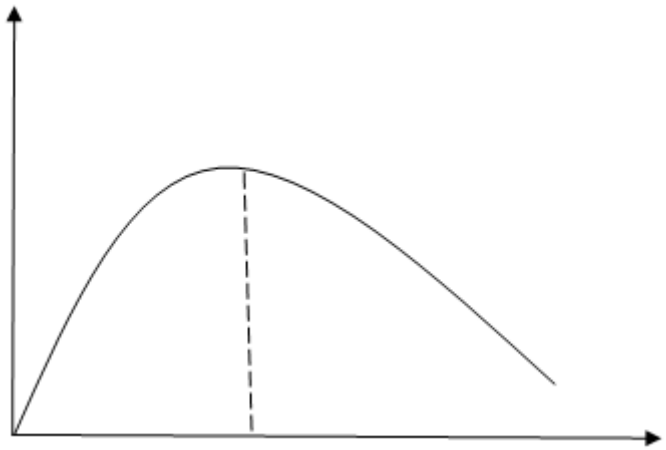
3.1 Theoretical Framework

This study employed Laffer curve as it theoretical framework, the theory provides a powerful insight into the relationship between tax rate and tax revenue/compliance. According to Laffer (2004), Laffer curve got its name from an article titled, "Taxes, Revenues, and the 'Laffer Curve."by Jude Wineskin in 1978. Laffer (2004), further said that in December 1974, he had Donald Rumsfeld (Chief of Staff to President Gerald Ford), and Dick Cheney (Rumsfeld's deputy) at the Two Continents Restaurant at the Washington Hotel in Washington, D.C. While discussing President Ford's "WIN" (Whip Inflation Now) proposal for tax increases, I (Laffer) grabbed a napkin and a pen and sketched a curve on the napkin illustrating the trade-off between tax rates and tax revenues. Wanniski named the trade-off "The Laffer Curve."

Laffer (2004), admitted that Laffer curve was not invented by him, because similar idea was found in Ibn Khaldun, a 14th century Muslim philosopher work's called Muqaddimah. That was why Sen, Cevik, and Kaya, (2017), called the curve "Khaldun-Laffer curve". The main idea behind the curve is that, it is not always increasing tax rate will leads to an increase in tax revenue, the outcome of any tax rate increase will depend on the elasticity of tax compliance of the economy.

The problem of low tax revenue in any economy can be reduced in three principal ways, depending on the cause of the low revenue: Firstly, by increasing tax rate, this is usually applied when the compliance rate in the economy is very high. Secondly, by expanding the tax base, this is mostly applied, in an environment where the low revenue was caused by tax policy itself such as unnecessary tax exemptions and waivers. Lastly by increasing tax compliance level this is applied when the low tax revenue was principally caused by high rate of tax non-compliance that may be as a result of loopholes in tax laws, inefficient tax policy or weak tax administration. The choice of what to do is not an easy one, it has generated a lot debate and conflict among tax experts and stakeholders. Sometimes circumstances may permits revenue authorities to employ combination of any two or all the above mentioned strategies to curb a problem of low tax revenue.

Figure I: Laffer curve



According to the Laffer curve an increase in tax rate will only lead to an increase in tax revenue if the rate of the tax is below the optimum tax rate, from the figure I, the optimum tax rate is T. Any increase in tax rate above T will have a negative impact on tax revenue. The optimum tax rate is determined by the rate of tax compliance, strength of tax enforcement, competence and integrity of tax administrator, soundness of tax policies and tax laws of the economy and public perception on the integrity of political authority. If a low tax revenue was caused bylow tax compliance rate, especially in an economy associated with corruption and a weak tax enforcement; the increase will leads to a decrease in tax compliance rate and consequently fall in tax revenue. In such kind of environment increase in tax rate will affect the tax compliance behaviours of the tax payers and will increase the set of taxpayers that will be manipulating the tax system in a negative manner. While in a relative tax compliant environment, with a high propensity to comply with the tax law, an increase in tax rate could lead to an increase in tax revenue and possibly tax compliance.

The basic things that we can understand from Laffer curve is that any increase in tax rates may have three effects on tax revenues: the arithmetic effect, the economic effect and social effect. The arithmetic effect is the basic reasoning, and it is what many people thinks of when considering a change in tax rates; if tax rate is increased by one percent, many people thinks that tax revenue will also increase by at least one percent. The Arithmetic effect of tax rate increase has positive impact on tax revenue. The economic effect, considers the negative impact that an increase in tax rate may have on consumption, output, and employment and consequently the tax base. The Economic effect of tax rate increase has negative impact on tax revenue. Then lastly the social effect, which look at how the society perceives the tax system, the tax compliance level rate, and tax enforcement level. If the public perception about the tax system is negative, the tax compliance rate is low and the tax enforcement is weak, then the cumulative impact of increase in tax rate on tax revenue will be negative. Therefore if the negative economic and social effect outweighed the positive arithmetic effect, then the impact of tax rate increase on tax revenue will be negative and vice versa.

Therefore a choice of what an economy should do to improve tax revenue, will depend on the causes of the low tax revenue in the economy. Because taxation performance of any economy will largely depend on endogenous variables of the economy as Todaro and Smith (2011), said taxation potentials of a country depends on: level of per capita real income, degree of income inequality, industrial structure of the economy, social,

political and institutional settings of the economy, and lastly the administrative competence, honesty and integrity of the tax revenue generating agency of the country.

3.2 Sources and nature of data

The data were sourced from the Central Bank of Nigeria (CBN) statistical bulleting of 2018. For VAT gaps analysis, annual data were used, while quarterly data were used to run the econometric model to measure the impact of the gaps on the VAT Revenue.

3.3 Technique of data analysis

The study employed Auto Regressive Distributed Lag (ARDL) Model and Vector Error Correction Model (VECM) to analyse the variables. The ARDL is very efficient when the variables under study were integrated at order, I(0), I(1) or combination of both. Nkoro and Uko (2016), ARDL cointegration technique is preferable when dealing with variables that are integrated of different order, I(0), I (1) or combination of both. Similarly Aliha, et al (2017), said that ARDL has become popular because: It is able to estimate the long and short-run parameters of a model simultaneously, it avoid the problems posed by non-stationary data, there is no need to determine the order of the integration amongst the variables in advance, and it is statistically much more significant approach for the determination of the cointegration relationship in small samples, while allowing different optimal lags of variables.

$$\Delta y_t = -\sum_{i=1}^{p-1} \gamma_i^* \Delta y_{t-1} + \sum_{j=1}^{k} \sum_{i=0}^{q_j-1} \Delta X'_{j,t-i} \beta_{j,i}^* - \rho y_{t-1} - \alpha - \sum_{j=1}^{k} X'_{j,t-1} \delta_j + \epsilon_t \quad 1$$

To avoid misleading characteristics of time series macroeconomic variables which in most cases are non-stationary, the study examined the time series properties of all the variables under investigation using the Augmented Dickey-Fuller (ADF)and Philips Perron (PP) Test to confirm the stationarity level of each of the variables.

$\Delta y_t = \beta_1 + \beta_2 t + \theta y_{t-1} + \sum_{i-1}^{n} \varphi \Delta y_{t-1} + \boldsymbol{\epsilon_t}$ 2

Where y_t represents the relevant variables under investigation and ϵ_t is a random term.

The study also employed Bounds co-integration test technique to ascertain whether the variables are co-integrated that is, if there is long run equilibrium relationship among the variables.

3.4 Model Specification

Autoregressive Distributed Lag (ARDL) Model was utilised to examine the relationship between the dependent variable and the independent variables. Thus, the model is specified as:

VATR = f (CONT, CGAP, PGAP) 3

Where VATR = Value Addded Tax Revenue Generated,

CONT = Final Aggregate Consumption,

CGAP= VAT Compliance Gap

PGAP = VAT Policy Gap, and expenditure on agriculture, health and education were taken as proxy.

ECT = Error Correction Term, and E_i= Error term in i per quarter

IV. RESULT AND DISCUSSION

4.1 Descriptive Statistics

4.1.1 Analysis of VAT Gaps

Table 1: VAT Gap Statistical Summary

Year/Items	VAT Total Gap (VTG) as % of GDP	VAT Policy Gap (VPG) as % of GDP	VAT Compliance Gap(VCG) as % of GDP	VAT Revenue as % of GDP	VTG as % of VAT Revenue	VPG as % of VAT Revenue	VCG as % of VAT Revenue
2010	2.3067	1.2704	1.0364	1.0306	223.816	123.260	100.556
2011	2.2585	1.1525	1.1060	1.0312	219.007	111.759	107.248
2012	1.9464	1.0762	0.8702	0.9900	196.608	108.708	87.900
2013	2.6740	1.0007	1.6734	0.9933	269.193	100.735	168.458
2014	2.7206	0.9418	1.7788	0.8919	305.017	105.589	199.428

2015	3.1248	0.9268	2.1980	0.8272	377.772	112.048	265.725
2016	3.3007	0.8930	2.4077	0.7991	413.061	111.753	301.308
2017	3.1694	0.8217	2.3477	0.8472	374.117	96.995	277.123
2018	2.7172	0.6990	2.0182	0.8013	339.654	87.381	252.273

Author's Computation from the original Data 2019, using Excel 13.0

From column 5 of the above table, VAT revenue as a percentage of GDP was 1.03% in 2010, falls to 0.99% in 2011 and 2012; the percentage keeps falling down to 0.799% in 2016; the percentage rise to 0.84% in 2017 and finally falls to 0.801% in 2018. The higher the percentage, the better the tax system.

From columns 2, 3, and 4 of the above table, VTG, VPG and VCP as a percentage of GDP in 2010 are 2.30%, 1.27% and 1.04% respectively; each gap is more than the VAT revenue collected in the year. The VTG rise to 3.3 % in 2016, but keeps falling to 2.71% in 2018. VPG as percentage of GDP was on the down ward trend from 2010 to 2018. In 2010 VPG was 1.27 %, and has been falling consistently down to 0.69% of the GDP in 2018. VCG as a percentage of GDP was 1.03% in 2010, falls to 0.87% in 2012; the VCG as a percentage of GDP rises to 1.67% in 2013 keeps rising up to 2.4 % in 2016; and falls to 2.43% and 2.02% in 2017 and 2018 respectively. The lower the percentage, the better the tax system.

From columns 6, 7, and 8 of the above table, VTG, VPG and VCP as a percentage of VAT revenue in 2010 are 223.82%, 123.26% and 100.56% respectively. VTG in 2010 was two times the VAT revenue collected, falls to 196.61% in 2012; rises to 269.19% in 2013, keeps rising up to 413.06% in 2016; the gap is on the down ward trend from 2017 to 2018, in 2017 it was 374.12% and 339.65% in 2018. VPG as percentage of VAT revenue was 123.60% in 2010 and keeps falling down consistently to 87.38% in 2018.VCG as a percentage of VAT revenue was 100.56% in 2010, falls to 87.90% in 2012; the VCG as a percentage of VAT revenue rises to 168.46% in 2013 keeps rising up to 301.308 % in 2016; and falls to 277.12% and 252.27% in 2017 and 2018 respectively. Even the all the gaps are falling from 2017 to 2018, but yet they are at the high side, in 2018 VPG was 87.38% of the VAT revenue collected, while VCG was 252.27% of the VAT revenue collected in that year; the VCP was more than two times of the VAT revenue collected in 2018, this indicate a huge revenue loss.

4.1.2 C-Efficiency Ratio

As stated in the conceptual literature C-Efficiency Ratio is ratio that measures VAT performance of country, it ranges from Zero (0) the poorest performance to one (1) the highest performance. This study decomposes C-Efficiency to two components: Total C-Efficiency, which given as total VAT revenue collected divided by total Theoretical VAT liability, and Compliance C-efficiency, which is total VAT revenue collected divided by Theoretical VAT liability less VAT exempted.

Compliance C-Efficiency Ratio measures the VAT performance of an economy, taking into consideration VAT Laws of the economy. The higher the ratio, the better the tax system.

Table 2: C-Efficiency Table

Year/Items	C-Efficiency (Total)	C-Efficiency (Total) as percentage	Compliance C-Efficiency	Compliance C-Efficiency as Percentage
2010	0.3088	30.8817	0.4986	49.8614
2011	0.3135	31.3473	0.4825	48.2514
2012	0.3371	33.7145	0.5322	53.2197
2013	0.2709	27.0861	0.3725	37.2498
2014	0.2469	24.6903	0.3340	33.3970
2015	0.2093	20.9305	0.2734	27.3430
2016	0.1949	19.4909	0.2492	24.9185
2017	0.2109	21.0918	0.2652	26.5166
2018	0.2275	22.7452	0.2839	28.3871

Author's Computation from the original Data 2019, using Excel 13.0

From the above table column 1 and 2, the VAT collection performance of the country, if we assumed it applies the standard rate (5%) on all goods and services consumed within the economy , without any exemption, was 0.3088(30.88%) in 2010. The collection performance falls to 0.2709 (27.09%) in 2013, it keeps falling down to 0.1949 (19.49%) in 2016, the ratio rise up to 0.2109(21.09%) in 2017 and 0, 2275 (22.75%) in 2018.c Despite the rise in 2018, the country collected only 22.75 % of what it should have collected, if thestandard rate (5%) was applied on all goods and services consumed within the economy, without any exemption.

Column 4 and 5 of the table above, indicate the VAT collection performance of the country, given the VAT laws of the country, it measures the performance of the Revenue Authority in terms of VAT collection. This ratio measures the VAT compliance level in the country. In 2010 VAT compliance performance of the country was 0.4986 (49.86%), it keeps falling consistently year by year down to 0.2492 (24.92%) in 2016. The ration rises to 0.2652 (26.52%) and 0.2839 (28.39%) in 2017 and 2018 respectively. Though the compliance performance ratio has been rising from 2017, but yet the performance was only 28.39 % in 2018, which might be considered very low. These low ratios both total and compliance are indication of a significant noise within the VAT system in Nigeria.

4.2 Econometric Analysis

4.2.1 Unit Root Test

With to view to have an accurate estimate and prediction, to avoid the problem of spurious regression, and to select an appropriate model; Augmented Dicker Fuller (ADF) Test and Phillip Peron (PP) Test were conducted to confirm the stationarity of the variables. The Variables were transformed to stationarity at different stages as shown in table 3below.

Table 3: Unit Root Test Output Table.

Test	ADF			PP			
Test/Variables	**Level**	**1st Diff.**	**2nd Diff**	**Level**	**1st Diff.**	**2nd Diff**	**Remark/Decision**
VATR		I(1)			I(1)		Stationary at First Difference
FCON		I(1)			I(1)		Stationary at First Difference
PGAP	I(0)			I(0)			Stationary at Level
CGAP		I(1)			I(1)		Stationary at First Difference

Source: Authors computation 2019 using eviews 10.

4.2.2 Lag Length Selection Criteria

Sometimes the impact of independent variable(s) on dependent variable is not immediate, but after a period of time (lag), and also with a view to avoid losing degree of freedoms, multicollinearity and serial correlation problem ; the study embarked on lag selection procedures, with a view to select an appropriate lag for the model so as to avoid misled interpretation. The lag selection criteria favours lag 1 for the model. This means that the endogenous variables impact on the exogenous variable will after one quarter.

4.2.3 Short Run ARDL Model

Table 4: Short Run ARDL Model's Output

Variables	Coefficients	P.Values	Others
C	28.7843	0.0227	R-squared =0.6283
VATR (-1)	0.08254	0.0198	Adjusted R-squared=0.5726
FCON	0.00974	0.0641	F-statistic =11.1342
PGAP	-0.06544	0.0321	Prob(F-statistic)= 0.000164
CGAP	-0.07282	0.0462	Durbin-Watson stat=2.8926

Source: Authors computation 2019 usingeviews 10.

The coefficients of the variable, previous quarter VAT Revenue (VATR) is 0.08254, which indicates a positive relationship between the variable and present VATR. If previous quarter VATR increased by N1 billion, then the present VATR will increase by N8.3 million or any 100% increase of the previous VATR will leads to 8.3% increase in the present VATR. The P.Value of the coefficient is 0.0198, which less than 0.05, this indicate a statistical significant relationship between the variable and the VATR, the variable is statistically significant enough to influence the variation of the VATR in the short run.

The coefficients of the variable Final Aggregate Consumption (FCON) is 0.00974, which indicates a positive relationship between the variable and VATR. If FCON increased by N1 billion, then VATR will increase by N9.3 million or any 100% increase of FCON will leads to 0.97% increase in the VATR. The P.Value of the coefficient is 0.0641, which is more than 0.05, this indicate a statistical not significant relationship between the variable and the VATR; the variable is lacking statistically significant strength to influence or explain the variation of the VATR in the short run.

The coefficients of the variable VAT Policy Gap (PGAP) is -0.06544, which indicates a negative relationship between the variable and VATR. If PGAP increased by N1 billion, then VATR will decrease by N65.44 million or any 100% increase in PGAP will leads to 6.54% decrease in the VATR. The P.Value of the coefficient is 0.0321, which is less than 0.05, this indicate a statistical significant relationship between the variable and the VATR; the variable is statistically significant enough to explain the variation of the VATR in the short run.

The coefficients of the variable VAT Compliance Gap (CGAP) is -0.07282, which indicates a negative relationship between the variable and VATR. If CGAP increased by N1 billion, then VATR will decrease by N72.8 million or any 100% increase in CGAP will leads to 7.28% decrease in the VATR. The P.Value of the coefficient is 0.0462, which is less than 0.05, this indicate a statistical significant relationship between the variable and the VATR; the variable is statistically significant enough to explain the variation of the VATR in the short run.

The F Statistic value of the model is 11.1342, the high F Statistic in an indication of the goodness of the model. The P Value of the F. Statistic is 0.000164, which is less than 0.05, meaning that the combination of the independent variables have the statistically significant strength to explain the variation of VATR in the short run. The R- Squared value of the short run model is 0.6283, which represent 62.83 percent. The result means that the model is able to explain 62.83 percent short run variation or movement of VATR in Nigeria.

4.2.4 Long Run Bounds Cointegration Test

The F. Statistics value the Bounds Cointegration test is 5.4821, which is greater than all the I(0) bound values, this confirmed a long run relationship among the variables of the model. Similarly the absolute value of T statistics of the Bounds Cointegration Test is 4.9231, which is also greater than all the I(0) bound values. The study therefore accepts the existence of long run association ship of the variables of the model.

4.2.5 The Long Run Model

Table 5: The Long Run Model's Output

Variables	Coefficients	P.Values	Others
C	214.1300	0.0020	R-squared =0.4903
FCON	0.0621	0.0575	Adjusted R-squared=0.4762
PGAP	-0.0684	0.0356	F-statistic =8.0298
CGAP	-0.0582	0.0000	Prob(F-statistic)= 0.0000
ECT	-0.2904	0.0010	Durbin-Watson stat=2.7937

Source: Authors computation 2019 using eviews 10.

The coefficients of the variable Final Aggregate Consumption (FCON) is 0.0621, which indicates a positive long run relationship between the variable and VATR. If FCON increased by N1 billion, then VATR will increase by N62.1 million or any 100% increase of FCON will leads to 6.21% increase in the VATR. The P.Value of the coefficient is 0.0575, which is more than 0.05, this indicate a statistical not significant relationship between the variable and the VATR; the variable is lacking statistically significant strength to influence or explain the variation of the VATR in the long run. Though there is a slight improvement from the short run coefficient and P.Value.

The coefficients of the variable VAT Policy Gap (PGAP) is -0.0684, which indicates a negative relationship between the variable and VATR. If PGAP increased by N1 billion, then VATR will decrease by N65.44 million or any 100% increase in PGAP will leads to 6.84% decrease in the VATR. The P.Value of the coefficient is 0.0356, which is less than 0.05, this indicate a statistical significant relationship between the variable and the VATR; the variable is statistically significant enough to explain the variation of the VATR in the long run.

The coefficients of the variable VAT Compliance Gap (CGAP) is -0.0582, which indicates a negative relationship between the variable and VATR. If CGAP increased by N1 billion, then VATR will decrease by N58.2 million or any 100% increase in CGAP will leads to 5.82% decrease in the VATR. The P.Value of the coefficient is 0.0462, which is less than 0.05, this indicate a statistical significant relationship between the variable and the VATR; the variable is statistically significant enough to explain the variation of the VATR in the long run.

The F Statistic value of the model is 8.0298, the high F Statistic in an indication of the goodness of the model. The P Value of the F. Statistic is 0.0000, which is less than 0.05, meaning that the combination of the independent variables have the statistically significant strength to explain the variation of VATR in the long run. The R- Squared value of the long run model is 0.4903, which represent 49.03 percent. The result means that the model is able to explain 49.03 percent long run variation or movement of VATR in Nigeria. This in an indication in the long run, VATR will mostly determine by other factors, that are outside this model, the factors such as e-commerce, e-tax ,intangible properties etc. may play an important role for the determination of VATR in Nigeria, in the long run.

4.2.6 Vector Error Correction Term of the Model

Vector Error Correction Model was employed to measure how fast the system can correct it previous disequilibrium. From Table 5, the error correction term (ECT) is -0.2904, the negative sign implies that the

model can be able to correct it previous disequilibrium at the rate of 29.04 percent per quarter. The probability value of the ECT is 0.0010, which is less 0.05, this means that the model possess the significant statistical ability to correct the previous disequilibrium.

4.3 Post Estimation Test

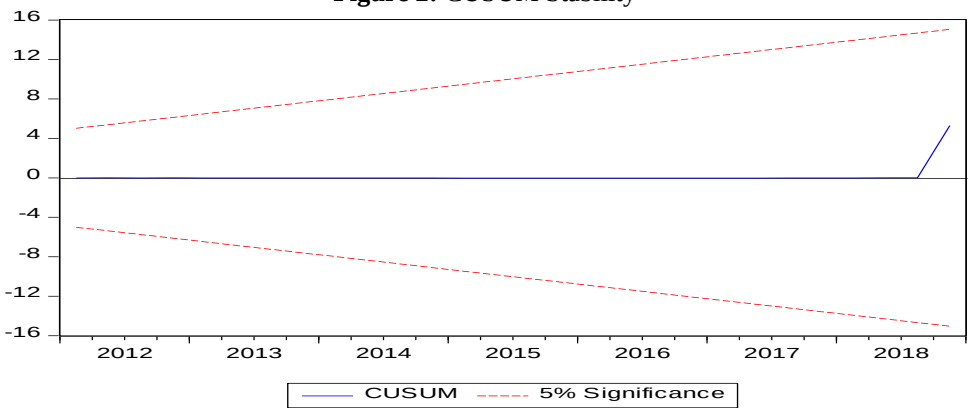
4.3.1 Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test was employed to confirm the existence or otherwise of Serial Correlation. The probability value of the observed R Squared is 0.2341, which is more than 0.05, the study therefore accepts the null hypothesis that the variables are not serially correlated and this is desirable. Serial correlation occurs when the error terms associated with given period of time was carried over to a future period of time. This may lead to overestimation or underestimation of the model coefficient, which may affect the efficiency of the model. Positive serial correlation will make the estimates standard error smaller than the true standard error; this will lead to a conclusion that the parameter estimates are more precise than they are, and by that null hypothesis will rejected when it should not be. Serial correlation does not affect the unbiasedness or consistency of estimators but efficiency.

4.3.2 Model Stability Test

Cumulative Sum Control Chart (CUSUM) was employed to measure the stability of the model. If a model is not stable it cannot be efficiently use for forecasting. The below chart confirm the stability of the model. Since the blue line is in between the two red lines, this implies that the parameters of the model are stable, and can be efficiently use for forecasting

Figure 2: CUSUM Stability



V. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The empirical results obtained by this study confirmed a short run positive relationship between Aggregate Final Consumption (FCON), previous quarter VAT Revenue (VAT-1) and Value Added Tax Revenue (VATR) in Nigeria. The short run empirical result also found a negative relationship between VAT Policy Gap (PGAP), VAT Compliance Gap (CGAP) and VATR. While the long run model found a positive relationship between FCON and VATR, and also a negative relationship between PGAP, CGAP and VATR in Nigeria. The Error Correction Term (ECT) of the Model, confirmed that the model has the statistical capacity to correct its previous disequilibrium.

5.2 Recommendations

Based on the empirical results findings, the study proffers the following suggestions, which may assist in improving Value Added Tax Revenue Generation in Nigeria:

1- There is a need for the review of the VAT Act, to minimize the volume of exemptions and zero rated products, those that are economically necessity should be properly defined by the Tax Laws; with a view to reduce the size of the VAT Policy Gap and to also minimize the negative impact of the gap on VATR in Nigeria.

2- The Revenue Authority in charge of VAT in Nigeria, should liaise with the States and Local Revenue Authorities, so as to put additional efforts to increase VAT compliance level to at least 70%, from the 28% in 2018.

3- Since VAT is a consumption Tax, then VAT payment processes by companies should decentralized to the places, where there even took place, and State and Local Government Revenue Authorities should be given powers to check VAT compliance within their jurisdiction and report any act of non-compliance to FIRS.
4- Even though the study realised that the country VAT rate is the lowest in the West African Sub region, still the relevant stake holders should adequately take compliance factors into consideration, before making any increase in the VAT rate; because increasing VAT rate in an economic environment associated with low tax compliance rate, may lead to an increase in the team of VAT evaders and consequently falls in the tax revenue.
5- The long run model account for only 49% variation of the VATR, this means the variables that constitute larger proportion that explain the variations of the VATR were left out, there is a need for a comprehensive study that will find out the determinant of the long run VATR, so as to help the Revenue Authority to take necessary measures that will ensure the determinant do not impact negative on the VATR in the long run.
6- The Revenue Authority in charge of the VAT, should put more efforts toward the digitalization of both the tax administration and compliance processes, this will greatly increase the compliance rate.
7- The Revenue Authority, Law Makers and other relevant stake holders, should work closely toward reducing both VAT policy and Compliance VAT Gaps, because the two gaps are not completely independent.

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