CHAPTER TEN

THE IMPACT OF CHANGE IN VALUE ADDED TAX (VAT) ON ECONOMIC GROWTH IN NIGERIA

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Abstract
Tax increases have been one of the forefront considerations by various regimes in Nigeria for boosting non-oil revenue. In an attempt to restore and sustain economic growth, the Nigerian government has implemented an increase in the VAT rate from 5% to 7.5%, which its effect on economic growth has evoked for empirical evidence. This study therefore, used 2021 base year data and simulates the effect of increase in VAT on economic growth by utilising computable general equilibrium model. The simulation result revealed that increase in VAT has a negative influence on Gross Domestic Product in Nigeria. Based on the undesirable effect of VAT reform on GDP, the study concludes that increase in VAT is not favorable to economic growth in Nigeria. Even though Nigeria has one of the lowest VAT rate in the world, but rather than increasing VAT by 50%, the tax base should be expanded to capture other VAT exempted items in order to raise revenue since an upward shift in VAT influences the GDP negatively and lead to a loss in economic efficiency.

Introduction
The extent of economic expansion witnessed in a nation is influenced, in part, by the level of revenue generated within that nation. This is why the strategy for revenue generation is carefully managed to gather ample funds from diverse channels, including taxes, to support government operations. Consequently, taxation emerges as a crucial means of revenue generation in nearly all countries, with governments relying on tax income to perform their responsibilities, including providing public goods and services, upholding law and order, and overseeing commerce and industry to ensure both social and economic equilibrium (Chikwute, Chike & Oliver, 2022).

Value Added Tax (VAT) is a consumption tax implemented to generate revenue at each transaction or production process stage. It applies to goods and services consumed by any economic entity known for its ease of administration and the possibility of shifting its financial burden. The introduction of the VAT system in Nigeria in 1993 was primarily driven by the Nigerian government's desire to expand its domestic revenue sources, influenced by the successful implementation of VAT in other countries. VAT replaced sales tax, governed by the Federal Government Legislated Decree No. 7 of 1986 and administered by the Federal Inland Revenue Service (Omesi & Nzor, 2015).

The rationale behind imposing value added tax is that such taxes discourage spending while promoting savings, thereby stimulating economic activities (Bumpei, 2011). An upward adjustment of the VAT rate could enhance government revenue and reduce its reliance on oil-related income. Aligning with Keynesian consumption theory, an increase in taxes like VAT can impact household consumption levels and their spending choices. However, based on Friedman's permanent income hypothesis and Modigliani-Brumberg's life-cycle hypothesis, a tax increase does not necessarily have a negative impact on consumption unless it is an unexpected policy change (Kaya & Sen, 2015).

For decades, Nigeria heavily relied on crude oil as its primary source of revenue. However, this dependence on oil has proven unsustainable, particularly as the country faces challenges in meeting its financial obligations due to mounting debt. Consequently, the fiscal strategy of 2020 shifted VAT rates upward from 5% to 7.5% to reduce the budget deficit. The decision to increase VAT during a precarious period characterized by high inflation, poverty, and unemployment rates has prompted this study, which examined the ploy's impact on economic growth and other associated macroeconomic variables in Nigeria.

Issues of Value Added Tax in Nigeria

The incorporation of Value Added Tax (VAT) into the Nigerian tax system in 1994 followed the recommendations made by the Federal Government Committee, which examined VAT's feasibility as early as 1991 (FIRS, 1993; and Oghuma, 2017). The idea of introducing VAT in Nigeria originated from the findings of a study group led by Dr. Ugoh

Sylvester, which was established in November 1991 to assess the entire tax system. As noted by Inimino, Otubu, and Akpan (2018), and Loveday and Nwanyanwu (2015), VAT became operational in Nigeria and began generating revenue in 1994, after the enactment of VAT Decree No. 102 of 1993. Before approving a 7.5% VAT rate increase in 2020, it had remained at a flat rate of 5% since its inception, despite earlier attempts to raise it. The VAT system currently in use in Nigeria is of the product type, and its calculation method involves providing a credit wherein the amount of VAT charged must be explicitly indicated on the invoice for the taxable transaction.

VAT was introduced in Nigeria to replace the sales tax, which had been previously implemented in 1986 to complement the collection of taxes at the state level. In accordance with Section 8 of VAT Decree 102, 1993, any manufacturer, wholesaler, importer, or supplier of taxable goods or services in Nigeria must register with the tax authority within six months of commencing their business activities. Furthermore, it is a compulsory requirement for any business entity or individual intending to engage in transactions with any level of government in Nigeria to present documentary evidence of VAT registration and proof of prior VAT remittances to the VAT office. Non-resident entities must register with the VAT office using the entity's address for conducting business in Nigeria. Once registered, non-resident entities are expected to include VAT in their invoices to the Nigerian entity or individual they are transacting with, and this VAT is to be remitted in the currency specified in the contract or business agreement.

As per FIRS (2021), an amendment to Section 4 of the VAT Act has been implemented, altering the VAT rate from 5% to 7.5%. This change in the VAT rate became effective on February 1, 2020. Consequently, all transactions involving the supply of taxable goods and services from February 1, 2020, are subject to the new 7.5% rate.

The adjustment in the rate, transitioning from 5% to 7.5%, came into effect on February 1, 2020. Section 13A (2) of the Value Added Tax (VAT) Act, Cap V1, LFN 2004 (as amended) specifies that "A tax invoice shall be issued on supply whether or not payment is made at the time of supply" for VAT purposes. For contracts involving taxable supplies and ongoing

agreements signed before February 1, 2020, but with supplies or performance occurring on or after that date, the applicable VAT rate is 7.5%.

In accordance with Section 4 of the VAT Act, every taxable entity is required to collect tax at a rate of 7.5% on the value of the goods and services they provide, and this tax collected is termed output VAT. The net VAT payable, which is the difference between the output VAT and the input VAT, must be remitted monthly in the currency of the transaction on or before the 21st day of the preceding month of the transaction, and the necessary returns must be submitted to the tax authority. In the context of the Nigerian VAT system, three categories of taxpayers are required to withhold VAT at the source and submit it directly to the tax authority (FIRS, 223). These are:

i. Nigerian corporations engaged in taxable transactions with foreign companies operating within the nation.
ii. Government ministries, statutory bodies, and other agencies of government; and
iii. Companies operating in the Oil and Gas Sector.

VAT-Exempted Goods and Services in Nigeria under VAT Act in 2020

The Finance Act of 2020, with its subsequent amendments, introduced certain changes to the Value Added Tax Act, Cap. V1, LFN 2004 (FIRS, 2023). This Information Circular was issued to guide all concerned parties on properly implementing the relevant provisions of the VAT Act. In accordance with the amended Financial Act, all products and services provided within Nigeria are subject to VAT unless they are expressly listed in the First Schedule to the Act. Consequently, all products and services consumed or utilized within Nigeria fall under the purview of VAT in Nigeria. This aligns with the 'destination principle' of VAT.

VAT exemption is the provision made for goods and services not subject to VAT, either at the final point of sale to consumers or at certain intermediate stages involving business-to-business transactions. Typically, exempted goods and services are those that serve a public interest. Some exempt transactions are referred to as "zero-rated"

transactions because they result in no residual VAT being included in the final price.

As highlighted in the work of Alex-Adedipe and Aroh (2021), the governing structure overseeing Value Added Tax (VAT) in Nigeria encompasses a collection of legal provisions and regulations. This includes the VAT Act of 1993, which underwent amendments in 1996, 1999, and 2007, and the Finance Acts of 2019 and 2020. Additionally, it encompasses the VAT Modification Order of 2020, commonly known as "MO 20". The recent amendment of VAT exempted products is summarized as follows:

Microfinance Banks. In the past, Value Added Tax (VAT) exemptions covered all the services Microfinance Banks (MFB) provided. However, the VAT Modification Order 21 (MO 21) has refined this exemption, now applying only to Unit MFBs. As a result, VAT exemption exclusively applies to the services offered by MFBs holding tier 1 unit or tier 2 unit licenses.

Books and educational materials. In the VAT Modification Order 20 (MO 20), books and educational materials were originally classified as exempt. However, MO 21 has introduced a limitation, now confining this exemption to educational books and materials. In practical terms, books not intended for educational purposes will no longer qualify for VAT exemption.

Raw materials for production. According to VAT Modification Order 21 (MO 21), VAT exemption is specifically granted to raw materials used in manufacturing baby diapers, sanitary towels, and pharmaceutical products.

Agricultural Products. VAT Modification Order 21 (MO 21) demonstrates a diligent commitment to incorporating items and services that sustain Nigeria's Agricultural Sector. It encompasses products like agricultural seedlings and domestically manufactured animal feeds, listed as exempted products.

Electricity. To lower the total cost of electricity, VAT exemption applies to the following items: (i) gas supplied to electricity generating companies by gas producers; (ii) electricity supplied by generating companies to the national grid or the Bulk Electricity Company; (iii) electricity supplied by

transmission companies to distribution companies; and (iv) renewable energy equipment.

***Petroleum products*.** Items like aviation turbine kerosene, premium motor spirit, household kerosene, locally produced liquefied petroleum gas, and crude petroleum oils have been added to the list of VAT-exempted petroleum products.

Challenges of VAT Administration in Nigeria

Poor VAT administration, as identified by Olatunji (2009), is one of the problems confronting VAT in Nigeria. Tax authorities perform only the technical functions without performing the needed management functions. Taking the complexity of tax administration into consideration, there is bound to be ineffective tax administration. The performance of only technical functions leads to false declarations, refusal to complete tax return forms, fraud, inflation of deductible expenses, smuggling, default, illegal bunkering, etc. Dishonest practices by some tax officials also pose a serious threat to the effective tax administration in Nigeria, especially when such practices can demoralize honest taxpayers. According to Samba (2019), the following are some of the challenges of VAT administration in Nigeria:

i. *Tax Evasion and Fraud:* One of the significant challenges is tax evasion and fraud, where businesses may underreport their sales or overstate their input tax claims to reduce their VAT liability. This can lead to substantial revenue losses for the government.
ii. *Informal Sector:* Many businesses in the informal sector may not register for VAT or may not comply with VAT regulations, making it challenging to bring them into the tax net.
iii. *Complexity of Regulations:* VAT regulations can be complex, and businesses may struggle to understand and comply with them. Frequent changes to tax laws and regulations can compound this issue.
iv. *High Compliance Costs*: Complying with VAT requirements, including record-keeping, filing returns, and conducting audits, can be costly for businesses, particularly small and medium-sized enterprises (SMEs).
v. *Tax Gap:* The difference between the expected VAT revenue and the amount collected is known as the tax gap. Identifying and narrowing this gap is a persistent challenge for tax authorities.

vi. *Cross-Border Transactions:* In international trade cases, tracking and collecting VAT on cross-border transactions can be complex. Double taxation, tax havens, and transfer pricing can further complicate matters.
vii. *Cash Economy:* In cash-based economies, tracing and collecting VAT on transactions can be difficult because they often leave no paper trail.

Trend of Value Added Tax Revenue and Economic Growth in Nigeria

Prior to 2021, Nigeria experienced periods of economic growth, especially in the 2000s and early 2010s. However, the growth has been uneven, with many challenges, including income inequality, poverty, and infrastructure deficits. Nigeria faced an economic recession in 2016, largely due to falling oil prices and production disruptions in the Niger Delta region, which brought about renewed thoughts on domestic sustainability. The COVID-19 pandemic in 2020 also contributed to economic challenges. The Nigerian government committed to diversifying the economy away from oil and developing other sectors such as agriculture, manufacturing, and technology to reduce vulnerability to oil price fluctuations. To this effect, the VAT rate has been reviewed upward to increase government revenue.

The upward adjustment in VAT from 5% to 7.5% has been criticized widely and persistently for being unfair to low-income earners and families because it is believed that consumption taxes are regressive. Since VAT is a consumption tax, it is regressive (Urama, Yuni & Iheonu, 2020). Thus, a tax on consumption repressiveness is based on consumer expenditure, and the percentage of income spent on consumption declines as income rises. Analysis of Current consumption, in other words, tends to absorb a higher fraction of current income at low-income levels than in the middle or upper-income ranges. Since every buyer operates in the same market and is charged the same rate, the total incidence now depends on the quantum of items purchased.

In the view of Urama *et al.* (2020), the Federal Government of Nigeria may not be able to achieve its policy of increasing the VAT rate due to expected defaulters. The argument is that the Federal Inland Revenue Service (FIRS) should strive to expand the coverage of VAT to those who

are presently out of the tax net and generally increase compliance levels in place of VAT increase. The agitation to increase the VAT rate has not met the support of the legislative house. Even though the argument for expanding the coverage is valid, the subject of revenue expansion can only be met if VAT is reformed in accordance with the pace of development in the global economy. "Among several different tools that governments use to boost economic growth and development is VAT (Rias & Amiri-Aghale, 2013). According to Izedonmi and Okunbor (2014), VAT is already a major source of revenue in Nigeria.

VAT contributes a significant percentage of Nigeria's tax revenue as the FIRS reported a total VAT collection of ₦1.1 trillion of the total sum of ₦5.3 trillion it generated in the 2018 fiscal year (FIRS, 2023). A simple illustration of the performance of VAT and GDP in nominal terms from 2015 - 2021 is in Table 1.

Table 1: Recent VAT and GDP Trends in Nigeria

YEAR	VAT	GDP	Actual RGDP
2015	381.27	95,177.74	2.7864
2016	397.06	102,575.42	-1.5831
2017	473.77	114,899.25	0.82399
2018	533.74	129,086.91	1.91
2019	564.45	145,639.14	2.27
2020	699.37	154,252.32	-1.92
2021	969.41	176,075.50	3.4

Source: CBN (2021)

The trend of VAT revenue in Nigeria persistently increases from ₦381.27 billion in 2015 to ₦969.41 billion in 2021, with corresponding GDP in Nominal terms from ₦95,177.74 billion in 2015 to ₦176,075.50 billion in 2021. With the 7.5% increase in VAT in 2020, the VAT revenue largely increased from ₦699.37 billion in 2020 to ₦969.41 billion in 2021. As indicated by the increase in the actual growth rate from -1.92 to 3.4, adopting the VAT policy is promising for the economy's future growth.

Theoretical and Empirical Framework

The general equilibrium theory and the Harrod-Domar Growth models are relevant to the study. The General Equilibrium Theory was developed by a French economist, Leon Walras, in 1834, and he argued that all prices and quantities in all markets are determined simultaneously through market forces (Ekanem & Iyoha 1999). Greatly complemented by the works of Wilfredo Pareto and Francis Edgeworth in 1881, the theory contended that the economy is in a state of general equilibrium when the demand for every commodity and service is equal to its supply at a given price, which is VAT inclusive. The Computable General Equilibrium (CGE) modeling approach is an empirical counterpart of the general equilibrium analysis. It converts the Walrasian general equilibrium structure from an abstract representation of an economy into realistic models of actual economies. The idea is to use these models to evaluate policy options, such as tax, by specifying production and demand parameters and incorporating data reflective of real economies.

The Harrod–Domar models are economic growth models that explain the possible conditions to maintain a steady growth rate in the economy. The models allotted a key role to investment in the process of attaining growth. They emphasized its dual features in the economy, viz: the creation of income and increase of capital stock through augmenting productive capacity (Ofishe 2015). This dual characteristic of the Harrod-Domar models is the demand and supply effect that is apt for a simultaneous increase of income and outputs with the productive capacity of capital stock to avoid excess or idle capital to maintain full employment equilibrium despite the constraint.

Empirically, Orisadare and Fasoye (2022) investigated how Value Added Tax (VAT) impacted Nigeria's economic growth from 1994 to 2020, utilizing the Consumer Price Index (CPI) as a pivotal point. They employed the Threshold Vector Autoregressive (TVAR) technique for their analysis. The findings indicate that exceeding a 10 percent threshold in VAT poses a risk to the economy, whereas maintaining a VAT below the 7.59 percent threshold does not negatively impact the economy; instead, it enhances the overall well-being of the populace.

Chiricu (2019) carried out an assessment that measured the impact of VAT on the rate of economic growth in Southern Europe, gathering data from 1996 - 2017. The econometric model was based on a multiple regression equation, and the least squares estimation method was applied. The empirical evidence revealed a significant and positive impact of VAT on economic growth, while a poor and ineffective use of tax revenue during the period under review was discovered. Laura (2019) investigated VAT's impact on Nigeria's economic growth from 1981 to 2018 using Johansen co-integration and Vector Error Correction Mechanisms techniques. Results showed a significant and positive relationship existed between VAT and economic growth in Nigeria. According to the result, inflation was positively associated with economic growth, but the coefficient revealed an infinitesimal positive effect.

In a related study but employing Ex-post facto research design, Oraka, Okegbe, and Ezejiofor (2018) empirically analyzed the value added tax and the Nigerian economy, choosing 2003 - 2015 as the study period. The objective of the study was to determine the extent to which value added tax has affected Gross Domestic Product in the Nigerian economy within the study period. Findings showed that value added tax did not significantly affect Gross Domestic Product in Nigerian. A negative relationship between VAT and per capita income was also reported, while total revenue and value added tax were positively associated. The study concluded that the Nigerian economy would experience a slow decline in economic activities in case of VAT increase despite the positive relationship between VAT and revenue generation. The study, however, did not examine the impact of VAT reform on household welfare indicators; hence, it was not purely a welfare analysis even though it analyzed VAT effect on GDP, per capita income, and revenue generation.

Nchor (2016) looked at the impact of value added tax on economic growth in Nigeria from 1995 - 2014, using the OLS regression model. The study unveiled VAT's positive and significant impact on economic growth in Nigeria. It was also found that value added tax positively affects federally collected revenue. Yet, the author was silent about how economic growth will respond to an increase in VAT.

Exhausting the Buoyancy equation and ordinary least squares techniques, Pant (2016) gathered data from 1999-2013 and analyzed the revenue consequence of VAT on economic growth in Madhya Pradesh in India. The outcome of the analysis further revealed that revenue as a proportion of Gross State Domestic Product and VAT moved upward, indicating a positive impact on the economy. The study concluded that the implementation of value added tax by Madhya Pradesh turned out to be a favorable policy for the Madhya Pradesh tax system, given that sales tax was less beneficial to the state compared to VAT performance. It was, therefore, concluded that VAT has a positive impact on economic growth in India.

Similarly, Oyinpreye and Olatayo (2016) empirically examined the impact of value added tax (VAT) on government revenue and economic growth in Nigeria between 1994 and 2014. The analytical technique used was OLS regression. The study discovered a significant and positive relationship between value added tax, gross domestic product (GDP), and government total revenue in Nigeria. It was concluded that VAT is an effective tool to stimulate economic growth. However, the study did not point out the tax rate ideal for improving economic growth through increased government revenue.

Ekeocha (2011) investigated the potential economic effects of increasing value added tax rate from 5% to 15% using Orani-G computable general equilibrium model with 2009 data for Nigeria. The study found that VAT hurt real gross domestic product. Barrell and Weale (2009) used *Seemingly Unrelated Regressions* (SUR) from 1987-2007 to investigate the economics of VAT reduction in the United Kingdom. It examined the effect of a temporary cut in VAT on economic growth. The study showed that a reduction in VAT augmented GDP and consumption in the United Kingdom within the study period. Salman (2014) conducted an empirical investigation on VAT and economic growth in Nigeria by employing simple multiple regression and Pearson Product Moment correlation analyses. The study found a positive and significant effect of value added tax on gross domestic product. The correlation result also showed a positive and high level of association among value added tax and GDP. None of the above studies considered the effect of VAT on economic growth using the newly adjusted rate in Nigeria.

The data used were obtained from Nigeria's last update of the Social Accounting Matrix (SAM) in 2006, which was calibrated and reformatted to 2021 as the base year, given that 2020 was the year of the policy implementation in Nigeria. Thus, the paper made use of base year (2021) data that was obtained from the National Bureau of Statistics site, the Federal Inland Revenue Services (FIRS) site, the World Bank Statistical Bulletin, and the Central Bank of Nigeria (CBN) Statistical Bulletins.

The study utilized the Computable General Equilibrium (CGE) model to simulate the effect of the policy due to the model economy-wide framework that incorporates demand and supply interaction and feedback within which economic variables adjust until production and consumption decisions are consistent. VAT consequence should manifest as an increase or decrease in the prices of commodities and a collection of revenues. The adopted methodology has an efficiency tracing component in the economy; hence, it is relevant for policy use. The analysis made use of General Algebraic Modelling System (GAMS) software for the analysis.

The Computable General Equilibrium (CGE) model employed in this study is a modified version of Lofgren, Harris, and Robinson (2002) and Abachi and Iorember (2017). The model was, therefore, tailored to suit the purpose of this study. In line with the tenets of the CGE model, the study grouped the economy into four blocks, namely: prices, production and trade, institutions, and system constraints:

Price Block: The price system of the model assumed quality differences among commodities of different origins and destinations. The price block consists of equations in which endogenous model prices are linked to other prices (endogenous or exogenous) and non-price model variables.

Demand price of Domestic None Traded Goods: The model includes different prices for locally made products or domestic output used within the country, given that locally manufactured commodities are VATable based on the Nigerian tax system. In the presence of transaction costs, it is necessary to distinguish between prices paid by consumers and those received by suppliers, as given in Equation 1

Methodology

$$PDL_j = PLS_j + \sum PX_{j'} \cdot ijdj'j + \alpha VAT_j \quad j \in JD \text{----------1}$$

$$\begin{bmatrix} price \\ for \\ domestic \\ demand \end{bmatrix} = \begin{bmatrix} price \\ for \\ domestic\,or \\ local \\ supply \end{bmatrix} + \begin{bmatrix} cost\,of \\ input\,per \\ unit\,of \\ local\,sales \end{bmatrix} + \begin{bmatrix} VAT \\ adjusted \\ rate\,for \\ domestic \\ iterms \end{bmatrix}$$

Where $j \in JD$ = a set of commodities with domestic sales of domestic output and $ijdj'j$ = quantity of commodity j as trade input per unit of j produced and sold domestically.

Import Price: The import price is computed in domestic currency units as the price paid by the domestic users for the imported goods. It is computed as a transformation of the world's price of these imports, taking into account the exchange rate and value added tax (VAT).

$$MP_j = pwmj \cdot (1+vatmj) \cdot EXR + \sum PQj' \cdot ijm_{j'j} \quad j \in JM \text{-----2}$$

$$\begin{bmatrix} price\,of \\ import \\ for \\ commodity\,j \\ (NGN) \end{bmatrix} = \begin{bmatrix} import \\ price \\ (FCU) \end{bmatrix} \cdot \begin{bmatrix} VAT \\ adjusted \\ rate\,for \\ unit \\ commodity \end{bmatrix} \cdot \begin{bmatrix} exchange \\ rate \\ (NGN\ per \\ FCU) \end{bmatrix} + \begin{bmatrix} cost\,of\,trade \\ inputs\,per \\ import\,unit \end{bmatrix}$$

Price of Product on Sectors: Given that value added tax is levied on the product, then the vector of VAT including sectorial prices is defined in equation 3:

$$PA_a \cdot (1-\alpha) \cdot QA_a = VA_a \cdot QVA_a + PINTA_a \cdot QINTA_a \quad a \in A \text{----------3}$$

$$\begin{bmatrix} activity\,price \\ (net\,of\,VAT) \\ times \\ activity\,level \end{bmatrix} = \begin{bmatrix} value\,added \\ price \\ times \\ quantity \end{bmatrix} + \begin{bmatrix} aggregate\,input\,price \\ times \\ quantity \end{bmatrix}$$

Where: P = price of product from sector, vat = VAT collected from sectors, $1+\alpha$ = adjusted VAT rate, PA_a = price for an activity, QA_a = quantity (level) of activity, VA_a = value added price, QVA_a = quantity of

(aggregate) value-added, *PINTA*= price of (aggregate) value-added, $QINTA_a$ = quantity of aggregate input.

Absorption: The aggregate domestic spending on a commodity at domestic demander prices is termed absorption. Equation 4 defines absorption, which includes value added tax. Absorption is expressed as the sum of spending on domestic outputs and imports at the demand prices, *DDp* and *Mp*. The prices *DDp* and *Mp* include the cost of trade inputs and value added tax. Equation 4 expresses all import products and domestic sales of domestic outputs, excluding the exports output volume. The two terms of the equation on the right-hand side apply *JD* and *JM*, respectively (domestic and import demand for commodity *j*).

$$PQ_j \cdot (1 - vatq_j) \cdot QQ_j = DDp_j \cdot QD_j \quad + Mp_j \cdot QM_j \quad j \in (JD \cup JM) \text{-- ----4}$$

$$\begin{bmatrix} absorption \\ at\ demand \\ prices \\ net\ of\ VAT \\ for \\ commodity \end{bmatrix} = \begin{bmatrix} price\ of \\ domestic \\ demand \\ multiply\ by \\ domestic \\ sales\ quantity \end{bmatrix} + \begin{bmatrix} price\ of \\ import \\ multiply\ by \\ import \\ quantity \end{bmatrix}$$

Production and Trade Block

The production and trade block describes the various activities that producers in the country carry out. Production is carried out by activities assumed to maximize profits subject to their technology, taking prices (for their outputs, intermediate inputs, and factors) as given. The activity production function here can be expressed as follows:

$$QA_{\alpha_a^a} = \left(\delta_a^a . QVA_a^{-\rho_a^a} + \left(1 - \delta_a^a\right) . QINTA_a^{-\rho_a^a}\right)^{\frac{1}{\rho_a^a}} \qquad a \in ACE\left(\subset A\right) \text{----------5}$$

$$\begin{bmatrix} activity \\ level \end{bmatrix} = CES \begin{bmatrix} quantity\ of\ aggregate\ value\ added, \\ quantity\ of\ aggregate\ intermidiate\ input \end{bmatrix}$$

Where $a \in ACE(\subset A)$ = a set of activities with a CES function at the top of the technology nest, α_a^a= efficiency parameter in the CES activity function, δ_a^a= CES activity function share parameter, and ρ_a^a= CES activity function exponent. The value added and Factor Demand functions take the form:

$$QVA_{a} = \alpha_{a}^{va} \cdot \left(\sum_{f \in F} \alpha_{fa}^{va} \cdot QF_{fa}^{-\rho_{a}^{va}} \right)^{\frac{1}{\rho_{a}^{va}}} \quad a \in A \qquad \text{----------6}$$

Demand for Transactions Services

Equation 7 defines how fixed quantities of one or more transaction service inputs are required per unit of the traded commodity.

$$QT_{j} = \sum_{j' \in J'} \left(icm_{j'j} \cdot QM_{j'} + ice_{j'j} \cdot QE_{j'} + icd_{j'j} \cdot QD_{j'} \right) \quad j \in JT \text{----------7}$$

$$\begin{bmatrix} \text{demand for transactions service} \end{bmatrix} = \begin{bmatrix} \text{sum of demand for imports, exports and domestic sales} \end{bmatrix}$$

Institution Block

This block consists of equations that map the flow of income from value added to institutions and ultimately to households. These equations fill out the inter-institutional entries in Nigeria's Social Accounting Matrix.

Factor income

Equation 8 defines the total income of each factor.

$$YF_{f} = \sum_{a \in A} WF_{f} \cdot \overline{WFDIST_{fa}} \cdot QF_{fa} \qquad f \in F \text{----------8}$$

$$\begin{bmatrix} \text{income of factor } f \end{bmatrix} = \begin{bmatrix} \text{sum of activity payement (activity specific wage times employment level)} \end{bmatrix}$$

Institutional Factor Incomes

The institutional factor incomes from equation 9 is fragmented among domestic institutions in fixed shares after payment of indirect factor taxes and transfers to the rest of the world.

$$YF_{f} = shif_{if} \cdot \left[\left(1 - tf_{f} \right) \cdot YF_{f} - tsnf_{if} \cdot EXR \right] \quad \begin{matrix} i \in INSD \\ f \in F \end{matrix} \text{----------9}$$

Where $i \in INSD$ = a set of institutions (domestic and rest of the world), YF_f = income to domestic institution i from factor f, $shif_{if}$ = share of domestic institution i in income of factor f, tf_f = direct tax rate for factor f, and $tsnf_{if}$ = transfer from factor f to institution i.

Household Consumption Spending on Marketed Commodities

Equation 10 describes the consumption of market commodities (purchased at market prices) that are VAT inclusive. The VAT reform would, therefore, affect household consumption, which is an index of welfare. Each household is assumed to maximize utility function subject to a consumption expenditure constraint. It is referred to as LES (linear expenditure system) functions since spending on individual commodities is a linear function of total consumption spending, EH.

$$PQ_j \,.\, QH_{jh} = PQ_j \cdot + \beta^m_{j\,h} \cdot \left(EH_h - \sum_{j' \in j} PQ_{j'} \,.\gamma^m_h - \sum_{a \in A} \sum_{j' \grave{o}\ j} PXAC_{aj'} \,.\, \gamma^h_{a\,j'h} \right) \text{----------} 10$$

$$\begin{bmatrix} household \\ consumption \\ spending\ on \\ market \\ commodity\ j \end{bmatrix} = f \begin{bmatrix} total\ household\ consumption \\ spending, market\ price\ of\ j \\ and\ other\ commodity\ prices \\ (market\ and\ home) \end{bmatrix}$$

Investment Demand

Equation 11 defines the fixed investment demand, the adjusted factor multiplied by the base year quantity. Investment is exogenously fixed from the basic model since the adjusted factor is also exogenous. The investment demand is therefore given as:

$$QID_x = IDF \,.aqif_{j'} \quad \text{.....} 11$$

$$\begin{bmatrix} ivestment \\ demand\ which \\ is\ fixed\ for \\ commodity\ j \end{bmatrix} = \begin{bmatrix} adjusted\ factor \\ multiplied\ by \\ fixed\ investment \\ for\ the\ base\ year \end{bmatrix}$$

Where, QID_x is the fixed investment demand for commodity *x*, IDF is the adjusted factor for investment, $aqif_{j'}$ is quantity of fixed investment demand for the base year.

Government Consumption Demand

Government consumption demand, in which the main component tends to be the services provided by the government labor force, is also defined as the base-year quantity multiplied by an adjustment factor.

$$GDQ_j = \overline{AGDQJ}\ .\overline{qg_j} \qquad ----------12$$

Where GDQ_j =government consumption demand for commodity j, $\overline{AGDQJ}$ = government consumption adjustment factor (exogenous variable), and $\overline{qg_j}$ =base-year quantity of government demand.

System Constraint Block

This block defines the constraints that the economy must meet as a whole. In equation 13, the standard CGE model imposes equality between the total quantity demanded and the total quantity supplied for each factor. The supply of the two factors is assumed to be exogenous and given as parameters.

$$\sum_{a \partial A} QF_{f\,a} = \overline{QFS_f} \qquad f \in F \ ----------13$$

$$\begin{bmatrix} demad\ for \\ factor\ f \end{bmatrix} = \begin{bmatrix} supply\ for \\ factor\ f \end{bmatrix}$$

Institutional Indirect Tax Rates

Equation 14 defines the indirect tax rates of nongovernment institutions, which is VAT inclusive.

$$TVAS_i = \overline{tvas_i} \cdot \left(1 + \overline{TINSADJ} . tins01_i\right) + \overline{DTINS} . t \quad i \in INSDNG \text{ ----------14}$$

$$\begin{bmatrix} indirect \\ tax(VAT) \\ rate \\ for\ institution\ i \end{bmatrix} = \begin{bmatrix} base\ rate\ adjusted \\ for\ scaling\ for\ selected \\ institutions \end{bmatrix} + \begin{bmatrix} point\ changes \\ for\ selected \\ institutions \end{bmatrix}$$

Gross Domestic Product

Equation 15 expresses gross domestic product at factor price as a measure of economic growth. An increase in value added tax is expected to affect aggregate demand, particularly consumption and imports, with VAT inclusive in Nigeria.

$$GDP_f = EH_h^{vat} + QID_x + GDQ_j + NE_i^{vat_m} \text{ ----------15}$$

$$\begin{bmatrix} gross \\ domestic \\ product \end{bmatrix} = \begin{bmatrix} consumption \\ demand\ of \\ commodity\ j \end{bmatrix} + \begin{bmatrix} investment \\ demand\ for \\ commodity\ j \end{bmatrix} + \begin{bmatrix} government \\ consumption \\ demand\ for \\ commodity\ j \end{bmatrix} + \begin{bmatrix} net \\ export \end{bmatrix}$$

Simulation Design and Macroeconomic Closures

To achieve the objective of this study, a VAT policy scenario was created (increase in VAT from 5% to 7.5%) using a reformatted and updated Social Accounting Matrix (SAM) for Nigeria. The VAT scenario in this study is policy based and the new VAT rate was implemented in 2020 as a policy; hence, 2021 is chosen as the base year due to data availability. The baseline solution of the model assumes no change in the VAT policy. The CGE model's closure rules for the created scenario are that savings are endogenous. At the same time, investment is exogenously fixed, so individual sectorial investments do not have to vary in the same direction as savings. Furthermore, the current account balance, budget deficit, and savings were all determined endogenously.

Simulation Results

Effect of increase in VAT on economic growth (GDP) in Nigeria

The simulation results for the increase in VAT with respect to changes in household consumption, government consumption, exports, imports, and GDP are shown in Table 2.

Table 2: Effect of 50% increase in VAT on Economic Growth (GDP)

	Baseline Value (Bil. NGN)	Simulated Value (Bil. NGN	% Change
Total Household Consumption	43824.56	40694.709	-7.14
Investment Demand	43476.29	43476.29	0
Government Consumption	2074.92	391.39	-81.14
Exports	4111.59	5152.699	25.32
Imports	17,234.51	14022.972	-18.63
Net Export	-13122.92	- 8870.273	-32.41
GDP(C_p+I_d+Gp+N*e*)	76252.85	75692.116	-0.74
Price			23.42

Source: Author's computation using GAMS

The result from Table 2 showed that an increase in VAT would decline the county's GDP together with other macroeconomic variables apart from investment demand, which is assumed to be temporarily fixed based on the macro closure rule of the model, and exports, which favorably rise by double digits. The outcome demonstrates that aggregate consumption was reduced by 7.14% due to a hike in price by 23.42%, while government consumption decreased by 81.14% (from ₦2074.92 to ₦391.39). The findings imply that an increase in VAT may alter consumer behavior, and people may become more price-sensitive, seeking cheaper alternatives or reducing their overall consumption. Again, if businesses pass on the increased VAT costs to consumers through higher prices, it can contribute to inflationary pressures. Rising prices erode consumers' purchasing power and reduce their living standards. The business impact of the policy is that many businesses rely on consumer spending to generate revenue. A decrease in consumption can result in reduced business sales, which may lead to financial challenges, downsizing, or even closure for some companies.

The decline in government consumption signifies that when VAT rate is increased, some consumers may choose to save more and spend less (incentive for savings). Higher savings rates can lead to reduced government consumption because it means less demand for public services and benefits funded by tax revenues. This result aligns with

Tochukwu *et al.* (2015), who found that an increase in VAT worsened household consumption levels, which is theoretically plausible.

The result in Table 2 also indicates that exports rose by 25.32% while imports declined by -18.63% due to an upward review of VAT. The reason for the increase in exports when VAT rate is increased is that exports are VAT exempted, unlike imports; therefore, exports become more significant, making it more appealing to businesses. In addition, the improvement in export over import could be justified on the grounds that there is a growing demand for a country's exports in international markets; thus, the upward shift in VAT may not deter foreign buyers significantly. Strong demand can offset the effects of price increases caused by higher VAT rates.

The total output value of -0.74% indicates a pessimistic situation in the economy, meaning that an increase in VAT by 50 % has negatively affected GDP at factor price. A fall in GDP due to VAT reform may be due to the undesirable price effect on aggregate demand. Similarly, since total consumption is negatively affected by the upward VAT review policy, this will translate to the country's GDP, given that consumption is a component of aggregate demand. The result also showed that the increase in the VAT rate creates uncertainty for both consumers and businesses. Uncertainty may lead to cautious behavior, such as delaying major purchases or investments, which can hamper economic growth. Businesses may hesitate to expand or hire new employees in uncertain economic environments. The undesirable effect of VAT on economic growth is similar to Oraka, Okegbe, and Ezejiofor's (2018) findings.

The findings show that the net deficit of -32.41 signifies that the VAT policy is unfavorable to export or import. It shows that the review of VAT upwards declined GDP in Nigeria as demonstrated by the decrease in aggregate demand, meaning that the implemented policy cannot be used to attain sustainable economic growth. Therefore, an adverse effect of price increases due to VAT upward review translates to a decrease in aggregate demand, leading to a loss in economic efficiency.

However, due to high prices, the policy will discourage the consumption of goods and services produced in the country.

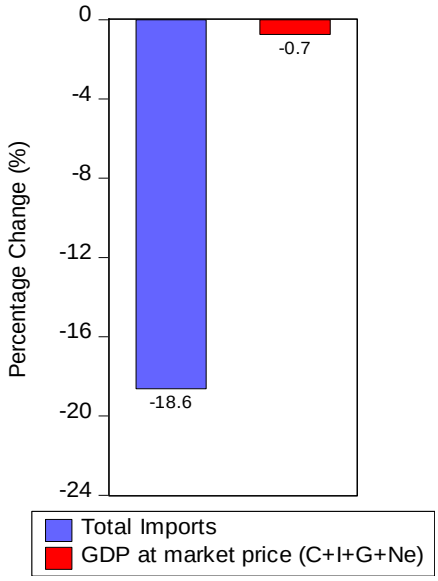

Figure 1: VAT on GDP at Market Price and Total Imports from the Simulation

Figure 1 indicates that GDP at market price shows no improvement but declines as a result of the VAT reform. The worst effect of the policy is that it does not leave out imported commodities in Nigeria. It further signified that the VAT policy may encourage more underground economic activities, as individuals and businesses may seek to avoid paying the higher tax rates. This can reduce tax revenues and hinder economic growth.

Conclusion and Recommendation

Based on the negative effect of VAT reform on household and government consumption, investment demand, net export, and GDP, the study concludes that an increase in VAT is not favorable to the Nigerian economy. Even though Nigeria has one of the lowest VAT rate in the world, rather than increasing VAT by 50%, we recommend that the tax base should be expanded to capture other VAT exempted items. This will reduce the general price level and increase the government's revenue base, which will cumulatively enhance the country's economic growth.

References

Abachi, P.T., & Iorember, P.T. (2017). Macroeconomic and household welfare impact of increase in Minimum Wage in Nigeria: A Computable General Equilibrium Model. *American Journal of Economics, 7*(5). 249-258.

Adams, S. (1921). 'Fundamental Problems of Federal Income Taxation, Quarterly Journal of Economics 35 (4) (1921). 528 -553.

Adegbie, F. F., Olajumoke, J., & Kwarbai, J. D. (2016). Assessment of value added tax on the growth and development of Nigeria economy: Imperative for reform. *Accounting and Finance Research, 5*(4). 163-178.

Alex-Adedipe, A. & Aroh, E. (2021). Value added tax regulatory update: Goods and services exempt from VAT in Nigeria. Retrieved from https://www.mondaq.com/nigeria/sales-taxes-vat-gst/1140932

Barrell, R. & Weale, M. (2009). The economics of a reduction in VAT. Fiscal Studies, 30(1). 17-30.

Bumpei, M. (2011). The effect of the value added tax rate change on aggregate consumption and economic growth. *Japanese Economy and Business Working Paper Series* No. 297. Retrieved from www.gsb.columbia.edu/cjeb/research

Chikwute; N. R. Chike, N. & Oliver, I. (2022). Effect of taxation on economic growth in Nigeria. *International Journal of Innovative Finance and Economics Research 10*(4).179-193

Chiricu, C. S. (2019). The analysis of the economic impact of VAT on the economic growth in Southern Europe. *Review of Economic and Business Studies, 12* (2). 47-56.

Ekanem, O.T. & Iyoha, M. A. (1999). Microeconmic Theory. First ed. Published by Mareh Publishers, Benin City, Nigeria.

Ekeocha, P.C. (2011). Modelling the potential economic effects of tax policy reform in Nigeria: simulation analysis using the CGE model. Paper presented at the AGRODEP members meeting and workshop June 6–8, 2011 Dakar Senegal

FIRS (2021). Clarification on the implementation of the value added tax (VAT) act. https://assets.kpmg.com/content/dam/kpmg/ng/pdf/clarification-on-the-implementation-of-the-value-added-tax-vat-act.pdf

FIRS (2023). Value Added Tax: A guild for new tax payers. https://www.firs.gov.ng/value-added-tax-vat/

FIRS. (1993). Federal Inland Revenue Service information circular. https://firs.gov.ng/wp-content/uploads/2021/06/VALUE-ADDED-TAX-VAT-9304.pdf

FIRS. (1999). Value Added Tax.Information Circular 9991,

Izedonmi,F.I.O & Okunbor,J.A. (2014). The Roles of Value Added Tax in the economic growth of Nigeria British *Journal of Economic,Management* & Trade,.4(12), 1999-2007.

James, K. (2011). Exploring the origins and global rise of VAT.Tax Analysts Faculty of law, Monash University, Melbourn. Ireland. *The Economic and Social Review, 42*(2). 213–235.

Jayachandran, S. (2019) Why a Tax the U.S. Hasn't Embraced Has Found Favor in Much of the World. Economic View, The NewYorkTimes https://www.nytimes.com/2019/05/17/business/value-added-taxenforcement.html

Kaya, A., & Sen, H. (2015). Taxes and private consumption expenditure: A component based analysis for Turkey. *Munich Personal RePEc Archive Paper* No. 61857

Lofgren, H., Harris, R. B., & Robinson, S. (2002). A standard computable general equilibrium model in GAMS. International food policy research institute: Washinton DC,USA.

Loveday, A., & Nwanyanwu. (2015). Value Added Tax Administration in Nigeria: *Journal Applied Economics and Finance 2* (4) Published by Red fame Publishing.

Manufacturing Association of Nigeria (2019). MAN cautions FG against VAT Increment. Leadership newspaper. https://www.newsheadlines.com.ng/leadership-newspapers

Nchor, E. E. (2016). Impact of value added tax on economic growth of Nigeria. A thesis submitted to the postgraduate school in partial fulfilment of the requirements for the award of the degree of master of business administration Federal University of Technology, Owerri.

Odu, V. C. (2022). Value added tax, revenue generation and economic growth in Nigeria. *Accounting and taxation review 6* (1). 10 - 28.

Oghuma, R. I (2017).Value added tax and economic growth in Nigeria. *Research Journal of Financial Accounting, 8* (14). 108-115.

Olaniyi, T. A., Bello, N., Funmilayo, Y., & Bolaji, A. (2019). Effect of Value Added Tax and Capital Gains Tax on Economic Growth in Nigeria: Traditional Versus Buoyancy Approach. *Entrepreneurial Journal of Management Science*,5(1) 2276-9471

Omesi, I., & Nzor, N. P. (2015). Tax reforms in Nigeria: Case for value added tax. *International Multidisciplinary Journal, Ethiopia, 9*(4). 39-49.

Omesi, I., & Nzor, N. P. (2015). Tax reforms in Nigeria: Case for value added tax. *African Research Review, 9*(4). 277-287

Oraka, A. O., Okegbe, T. O., & Ezejiofor, R. (2018). Effect of value added tax on the Nigerian economy. *European Academic Research***,** *5*(2). 1185-1223.

Orisadare, M. A. & Fasoye, K. (2022). The effect of value added tax on economic growth of Nigeria. *AJER, 10*(1). 158 – 169.

Oyinpreye, A. T., & Olatayo, D. J. (2016). Impact of value added tax on government revenue and economic growth In Nigeria. *International Journal of Management and Applied Science*, *2* (7). 92-97.

Pant, A. (2016). The revenue impact of VAT in Madhya Pradesh: Empirical evidence from India. *International Journal of*

Economics and Finance, Canadian Centre of Science and Education, 8 (5). 182-189.

Salman, A.Y. (2014). Value added tax and economic growth of Nigeria: An Empirical investigation. Retrieved from https://www.academia. edu/8133167/ Value _Added Tax_and_Economic_Growth_of_Nigeria_An_Empirical_Investigation

Samba, J. N. (2019). The role of taxation in any economy: The current Nigerian position. A paper presented at 12th inaugural lecture series, Benue state university, Makurdi.

Tochukwu, O. R., Kwarbai, J., & Okwu, A. T. (2015). Value added tax and consumption expenditure behavior of households in Nigeria: An empirical investigation. *International Review of Social Sciences, 3* (6), 236 - 248.

Sullivan, C. K. (1965). The Tax on Value Added, New York, 17

Urama, N. E., Yuni, D. N. & Iheonu, C. (2020). Increasing VAT rate from 5 to 7.5%: What are the Likely Impacts? Afriheritage Policy Brief No. 22 /SEPT 2019.