IMPACT OF VALUE ADDED TAX (VAT) COLLECTION ON HOUSEHOLD CONSUMPTION EXPENDITURE IN SOUTH WESTERN NIGERIA

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ABSTRACT

Studies have confirmed that an empirical relationship exist between the Value Added Tax and the level of aggregate consumption but the net impact of consumption taxes on growth and its sources is theoretically ambiguous, and depends on the interaction between utility parameters, the interest rate, and the tax structure.The study attempted to evaluate the extent to which VAT collection influences household cconsumptions expenditure in SouthWestern Nigeria by adopting panel method covering a period of ten (10) years. Random sampling incorporated with Slovin Formula was used to select three hundred and fifty six (356) respondent tax officers, vatable persons and three hundred and fifty three (353) households of VAT rated goods on whom questionnaires were administered. Secondary data were sourced from the approved budgets of the selected states from 2002 to 2011. Panel regression method augmented with co-integration approach, and vector auto regression was used to analyse collected data. VAT and Consumption variables were co-integrated in the long run for the states. The study revealed that VAT has the potential of positively enhancing revenue generation of the sampled states. The result of the test clearly indicates that increase in VAT necessitates an increase in the consumption expenditure.

Keywords: VAT; Consumption VAT; Income VAT; South western Nigeria; Revenue profile

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1.1: Introduction

The Federal Government of Nigeria enacted the VAT Amendment Act 2007 which empowered it to fix the rate of VAT to be imposed in Nigeria. Nigeria presently operates the consumption type of VAT under which capital purchases are treated in the same way as the purchase of any other input and it is simpler to compute than the income VAT and Gross Product VAT (Bickley, 2006). However, the average Nigerian investor queries imposition of tax giving the government's attitude to the development of infrastructural facilities characterized by several years of neglect (Ojeme, 2009). It follows that for any public payment to qualify as tax, it must have elements of compulsion as well as some degree of imposition by government agent together with an enabling law (Azubike, 2009). The realities of the global financial crisis, christened global financial meltdown swept through major economies of America and Europe who are the major consumers of Nigeria's crude oil exports and forced the international crude oil prices previously at an all time high of $147 per barrel to drop to $95 in July 2012.This informed the decision of the United States of America, the largest consumer of crude oil, to find alternative to it.The volatility of the commodity at the international market makes it imperative for a shift to other revenue sources which are untapped and poorly developed like VAT (Seunfunmi, 2009).

From all the taxes, personal income tax has remained the most disappointing, inefficient, unproductive and problematic in Nigerian tax system (Asada, 2005, Kiabel and Nwokah, 2009, Nzotta, 2007, Odusola, 2006, Sani, 2005). The failure of the previous income tax policies to address the revenue problems of government necessitates a study of the consumption tax such as VAT. Comprehensive tax reforms comprising of fiscal regime with significant reliance on consumption- based taxation such as VAT, that results in more saving and investment and a high growth rate, than under tax regimes heavily weighted toward income tax have been recommended; Acosta, (2011). In a related development, the crisis in the Niger Delta region (the oil producing states of Rivers, Bayelsa, Edo, Delta, Akwa Ibom, and Cross River, despite the amnesty granted to the militants in 2006 and the non-withdrawal of the military Joint Task Force (JTF) to maintain peace in the region is also a sufficient reason for exploring alternative sources of revenue to government, apart from crude oil (Udeh, 2002). Soriwei and Ekpimah (2012) shows that every state in Nigeria has resources it could develop to generate revenue. The persistent rejection of the non-oil producing states demand for more revenue from the Federation

account by the oil producing states is a fundamental issue that calls for other revenue sources to be tapped by the non-oil producing states in Nigeria.

Previous literature contains little empirical evidence on the linkage between Value Added Tax and revenue generation of state governments in developing countries including Nigeria and the few existing ones tends to find no significant effect from either the overall level of taxation or the direct-indirect tax mix (Adams and Bevan, 2005; and Martinez, Vulvonic and Liu, 2009). However, there are empirical links between VAT and revenue profile of some state governments as pointed out by Pinhanez, 2008. The VAT tool comes then as a blessing for many state governments to raise revenue and has been touted as the new money machine. It is important in this regard to understand the VAT components of revenue profile of some state government in Nigeria. Accordingly, a thorough analysis of the impact of VAT on revenue profile of selected state governments is an essential process for studying issues of consolidating government finance given the findings of Keen and Lockwood (2006) on how countries with a VAT system raise more revenue than those without it. For instance, Arnold (2008) concluded that consumption taxes such as Value Added Tax is least damaging for growth. Ebe and Ehrhart (2010) examined the volatility of tax revenue in many developing countries and concluded that non-diversification of revenue sources depresses public investment. Attali, Chambsa and Combes (2008) viewed corruption as strongly associated with low revenue just as tax like other governance indicators such as weak rule of law and political instability. Zolt and Bird (2005) concluded that VAT on the whole is likely to be less regressive than the sales and excise taxes it has replaced; thus justifying this study.

It has been noted that an empirical relationship exist between the Value Added Tax and the level of aggregate consumption but the net impact of consumption taxes on growth and its sources is theoretically ambiguous, and depends on the interaction between utility parameters, the interest rate, and the tax structure (Asmaa, 2006). This study should be of significance to the Nigerian Government as it will highlight the perceptions of the consumers of VAT *able* goods in Nigeria towards adjustments in the Value Added Tax structure. Nigeria's current revenue sharing formula is also to the disadvantage of non-oil producing states coupled with the fact that derivation also constitutes an important criterion in the determination of the share of any state or

local government from the joint accounts of the federation. Revenue accruable to the states from Federation account is grossly insufficient when compared to their increasing responsibilities in infrastructural facilities provision. The withdrawal of petroleum subsidy on 1st January, 2012 as a means of enhancing the revenue accruable to the Federation account coupled with the crisis that followed the removal has further given an authoritative evidence of the need for this research as increased prices of domestically consumed fuel will continue to create further problems in future due to fluctuations in international price of fuel

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This study covered five states (Lagos, Oyo, Ogun, Ondo and Ekiti) out of the six that make up South-Western part of Nigeria for years 2002 to 2011. The goal of this study is to empirically evaluate impact of Value Added Tax (VAT) collection on Household Consumption Expenditure in South Western Nigeria over the sampled period.

1.2 Statement of the Problem

The persistent volatility in the prices of crude oil in the international market which fell from $147 in 2010 to $105.58 in January 2011 and $95 in July 2012 now $54 in 2015 respectively; the attendant swings in government revenue particularly disrupted public expenditure management and government officials struggled to adjust budgetary provisions to ensure fiscal balances. Majority of the self-employed taxpayers are yet to be brought into the tax net in the states as a result of the non-availability of a comprehensive electronic taxpayers database and unique taxpayers personal identification number due to non-computerization of the operations of the State Internal Revenue Service, hence the need to explore alternative revenue sources to finance the diversification of the economy as required in this study.The submission of Pinhanez, (2008) that VAT tool comes as a blessing for many governments across the globe to raise revenues and has been touted as the new money machine calls for further empirical evaluation.

1.3 Research questions

This study generally evaluates the objectives and hypothesis on the basis of which these research questions are critically addressed.

- ✓ What is the relationship between VAT and household consumption expenditure in SouthWestern Nigeria?
- ✓ To what extent does VAT collection influence household consumption expenditure in South Western Nigeria?

1.4 Objectives of the study

- ✓ To examine the Revenue pprofile of State Governments in South Western Nigeria;
- ✓ To ascertain the extent to which VAT collection influences household cconsumptions expenditure in SouthWestern Nigeria.

1.5 Research Hypotheses

H_O: There is no significant relationship between Value Added Tax and consumer expenditure in South Western Nigeria.

2. LITERATURE REVIEW AND CONCEPTUAL CLARIFICATIONS

2.1 Concept of Value Added

The concept of value added from which VAT is derived refers to the additional value of a commodity over the cost of commodities used to produce it from the previous stage of production. In national accounts used in macroeconomics, it refers to the contribution of the factors of production, i.e., land, labour, and capital goods, to raising the value of a product and corresponds to the incomes received by the owners of these factors. It is this value added that VAT is levied upon. Consequently, value added tax, or goods and services tax is tax on exchanges at different points. It differs from sales because a sales tax is levied on total value of the exchange. Personal end consumers of products and services cannot recover VAT on purchases, but businesses are able to recover VAT on the materials and services that they buy to make further supplies or services directly or indirectly sold to end-users. In this way, the total tax levied at each stage in the economic chain of supply is a constant proportion of the value added by a business to its products, and most of the cost of collecting the tax is borne by business, rather than by the state.

According to Owolabi and Ekwu, (2011) VAT is a tax on consumption; the more you buy the more tax you pay. It is also a neutral tax on businesses in that it does not represent a real cost to anyone but the end consumer. Everybody pays tax to the Government whenever they purchase goods or services. This tax is collected for the government by the supplier of those goods and services. VAT revenue has become a significant source of government revenue in Nigeria. Therefore, the primary objective of fiscal policy is to raise more revenue through value added tax. The tax authorities have been guided by the need to design equitable and efficient VAT system capable of complementing government expenditure and, thus, reduce recourse to public borrowing. VAT rate in Nigeria has been determined in a way that minimizes disincentive effects on economic activities.

The effects of low tax effort in Nigerian have been strengthened by the value added tax system. This, in turn, has addressed part of the worries of Kaldor (1963) who asked "will underdeveloped countries learn to tax?" Bird, Vazques and Torgler (2007) noted that the underlying assumption of Kaldor's question is that a country [or state] wishing to develop needs to collect in taxes an amount greater than the 10-15 percent found in many developed countries. To meet the global aspiration of attaining the Millennium Development Goals (MDGs) come 2015, these countries must spend more on economic and social infrastructures, which can only be achieved through improvement in tax efforts to realize the required level of public expenditure (Golit, 2008).

2. 2. Appraisal of Value Added Tax in Developing Countries

The general advice of international institutions such as the International Monetary Fund (IMF) and the World Bank given to developing countries like Nigeria over the past few decades has been to replace trade taxes with domestic consumption taxes, particularly value added tax (VAT) and to maintain relatively high corporate income tax rates (Margalioth and Reuven,2006). Burgess and Stern (1993) reviewed previous literature and presented what is still regarded today as a conventional wisdom in respect of taxation in developing countries. According to their view, developing countries should have an indirect tax system based on the following elements; a VAT, with one or two rates and some exemptions with direct support for certain groups through

subsidies. They emphasised that the role of direct taxation in developing countries is much more limited due to narrow tax base and high enforcement costs in contrast to developed countries.

Tanzi and Howell (2000) further averred that an alternative approach to assess whether the overall tax level in a developing country is appropriate has been to compare the average tax burden of a representative group of both developing and developed countries , taking into account some of these countries characteristics. Margalioth and Reuven (2006) emphasised that consumption taxes are not necessarily regressive as this is offset through a more progressive use of the tax revenue generated from other sources, mostly through the expenditure side of the national budget. Emran and Stiglitz (2005), Gordon and Li (2005) challenged the conventional view, arguing that the relatively large informal sector, level of corruption, monetization, high shares of agriculture and small businesses in developing countries may justify a different tax policy design. The key assumption in their theory is that firms in developing countries can evade taxes completely by shifting entirely to cash transactions and not using the financial sector as the financial sector plays a critical role in the functioning of the tax structure. Gemmel and Morrissey (2003) asserted that taxes on intermediates such as fuel are often thought to be regressive because they affect transport costs, thus increasing the prices of goods consumed by the poor. The important implication of this for tax policy is that, on the basis of distribution and poverty, taxes on goods that are most important in the consumption bundles of the poor should be kept as low as possible. Furthermore, a number of studies have examined the various theoretical and empirical aspects of conversion from an income-based tax system to a consumption-based tax system including the response of the savings elasticity, the transitional issues, and the welfare effects (El-Ganainy, Asmaa Adel, 2006). The study further evaluated the impact of VAT as a form of taxing consumption on capital accumulation, productivity, growth and overall economic growth.

Matsuzaki (2003) assessed the effects of consumption tax on effective demand under stagnation using a two-class model with uneven wealth distribution. The author discovered that under stagnation, an increase in the consumption tax rate decreases effective demand in the case of heterogeneous households (when the ratio of poorer households is large relative to the total population).The line of reasoning of the author, which is acceptable in this study, is that an

increase in the consumption tax rate on richer household does not affect their consumption significantly because in this case the marginal utility of money reaches lower bound unlike when the consumption tax rate is increased on poorer households which decreases consumption due to the increase of the household marginal utility of money. Milambo (2001) used the Divisia Index method to study the revenue productivity of the Zambian tax structure for the period 1981 to 1999. The results showed elasticity of 1.15 and buoyancy of 2.0, which confirmed that tax reforms, had improved the revenue productivity of the overall tax system. However, these results were not reliable because time trends were used as proxies for discretionary changes and this was the study's major weakness.

Adekanola (2007) observed that taxation in this part of the world is seen largely as a source of internally generated revenue. While this view is not necessarily incorrect, seeing taxation merely as a revenue tool is a very limited perspective, the consequences of which may be more than academic. The use of taxation as a tool for encouraging savings and investment, redistributing income, curbing social ills, discouraging the production, importation, exportation and consumption of some goods and services which VAT is intended to achieve would be missed.

3. METHODOLOGY

The study covered five states of Ondo, Ogun, Lagos, Oyo, and Ekiti located in South-Western Nigeria. Lagos, Ogun, Oyo and Ekiti are specially selected based on their non-oil producing status while Ondo is selected because it is the only oil producing state in the region. Both primary and secondary data were used for this study. The primary data sources were collected from the direct responses from the staff of the state ministry of finance, budget and planning who are the main recipients of the VAT due to their State Government and the tax officers of the Federal Inland Revenue Service of the selected states, as the administrative authorities of the VAT. In order to collect the primary data, structured questionnaire and interview guide with consumers of VAT rated goods were adopted in the study. Using structured questionnaire, 361 respondents' tax officers and Vatable persons and 360 household of Vat Rated Goods were selected. The secondary data for the study were extracted from the approved budgets of the selected States for ten years (2002 to 2011) and information from Central Bank of

Nigeria and National bureau of statistics for the sampled period. The study employed panel unit root test along the line of Levin, Lin and Chu test (LLC, 1992), Breitung (2000), and Hadro (2000).

The panel unit test was based on the following Augmented Dickey-Fuller regression.

$\Delta x_{it} = \alpha_i + \beta_{it} + \rho_i X_{it-1} + \varepsilon_{it}$ .. .. (Equation 3.1)

Error term is ε_{it} and is IID.α_i and β_i allow for fixed and unit specific time trend for each *i*.

The null hypothesis of a unit root is

Ho: $\rho i = 0, \forall_i$

The alternative hypothesis is

H_a: $\rho i = \rho < 0, \forall_i$

This supposes that inter-state heterogeneity is captured by the fixed effect.

In this test, individual i = 1, Ni where X_{it} is stationary and individual $i = N_i + 1$ ..., N, where X_{it} is non stationary the t – statistic is an average and can be calculated as:

$t = \frac{1}{N}\sum_t^N t_i$

where t_i is the individual ADF t – statistics for the unit root test.

In the case of Hadri (2000) approach, the null hypothesis is the stationarity of the series instead of non stationarity, the model is specified as

$X_{it} = \gamma_{it} + \beta_{it} + \varepsilon_{it}$ ---------- (Equation 3.2)

Where γ_{it} is a random walk given by

$\gamma_{it} = \gamma_{it-1} + \mu_{it}$

Where μ_{it} is white noise. It assumed that

$E(\mu_{it}) = 0$ and $E(\mu_{it}^2) = \sigma^2_{uit} > 0$.

The null hypothesis is:

Ho: $\sigma^2_u = 0$

The Im, Pesaran and Shin (IPS), which is based on the well-known Dickey-Fuller is also considered in this study. Im, Pesaran and Shin denoted IPS proposed a test for the presence of unit roots in panels that combines information from the time series dimension with that from the cross section dimension, such that fewer time observations are required for the test to have power. Since the IPS test has been found to have superior test power by researchers in economics to analyze long-run relationships in panel data, we will also employ this procedure in this study.

IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \quad \text{---------- (Equation 3.3)}$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

IPS use separate unit root tests for the *N* cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the *t*-statistics for p_1 from the individual ADF regressions, $t_{iT_i}(p_i)$:

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT}(p_i \beta_i)$$

The *t*-bar is then standardized and it is shown that the standardized *t-bar* statistic converges to the standard normal distribution as N and $T \to \infty$. IPS (1997) showed that *t-bar* test has better performance when N and T are small. They proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component.

The next part of the process involves testing whether there is statistically acceptable co-integration relationship between VAT revenue and private consumption. This objective is achieved by applying the tests developed by Pedroni (1997, 1999), which develop seven tests for co integration in a panel context. Four of the steps are within dimension statistics and three are between dimension statistics. The four within dimension statistic are based on pooling the auto regression coefficients across the different States for the unit root tests on the estimated residuals; whereas the three between dimension statistics are based on the estimator that simply average the individual estimated coefficients for each State. For all the seven tests, the null hypothesis is no co integration.

The Pedroni co integration tests are based on estimating the static co integrating regression. The procedures proposed by Pedroni (1999) made use of estimated residual from the hypothesized long-run regression of the following form:

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \ldots + \beta_{Mi} x_{Mi,t} + e_{i,t} \text{ ---------- (Equation 3.4)}$$

For $t = 1, \ldots, T$; $i = 1, \ldots, N$; $m = 1, \ldots, M$,

where T is the number of observations over time, N number of cross-sectional units in the panel, and M number of regressors. In this set up, α_i is the member specific intercept or fixed effects parameter which varies across individual cross-sectional units. The same is true of the slope coefficients and member specific time effects, $\delta_i t$. Pedroni (1999 and 2004) proposes the heterogeneous panel and heterogeneous group mean panel test statistics to test for panel cointegration.Two sets of statistics are defined, the first of which include $Z_{\hat{v},N,T}$, $Z_{\hat{\rho}N,T\ 1}$ and $Z_{tN,T}$ is based on pooling the residuals along the within dimension of the panel. The statistics are as follows

$$Z_{\hat{v},N,T} = T^2 N^{3/2} \sum_{i=1}^{N}\sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t\ 1}^{2} \text{ ---------- (Equation 3.5)}$$

$$Z_{\hat{\rho}N,T\ 1} = T\sqrt{N} \sum_{i=1}^{N}\sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t\ 1}^{2} \quad {}^{1}\sum_{i=1}^{N}\sum_{t=1}^{T} \hat{L}_{11i}^{-2} \left(\hat{e}_{i,t\ 1} \Delta\hat{e}_{i,t} \quad \hat{\lambda}_i\right) \text{ ---------- (Equation3.6)}$$

$$Z_{tN,T} = \tilde{\sigma}_{N,T}^{-2} \sum_{I=1}^{N}\sum_{T=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t\ 1}^{2} \quad {}^{1/2}\sum_{i=1}^{N}\sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t\ 1}^{2} \left(\hat{e}_{i,t\ 1} \Delta\hat{e}_{i,t} \quad \hat{\lambda}_i\right) \text{ ---------- (Equation 3.7)}$$

where $\hat{e}_{i,t\ 1}$ is the residual vector of the OLS estimation of the above equation and where the other terms are properly defined in Pedroni.

The second set of statistics is based on pooling the residuals along the between dimension of the panel. It allows for a heterogeneous autocorrelation parameter across members. The statistics are as follows:

$$\tilde{Z}_{\hat{\rho}N,T\ 1} = \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{e}_{i,t\ 1}^{2} \quad {}^{1}\sum_{t=1}^{T} \left(\hat{e}_{i,t\ 1} \Delta\hat{e}_{i,t} \quad \hat{\lambda}_i\right) \qquad \tilde{Z}_{tN,T\ 1} = \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{e}_{i,t\ 1}^{2} \quad {}^{1/2}\sum_{t=1}^{T} \left(\hat{e}_{i,t\ 1} \Delta\hat{e}_{i,t} \quad \hat{\lambda}_i\right)$$

These statistics compute the group mean of the individual conventional time series statistics. The asymptotic distribution of each of those five statistics can be expressed in the following form:

$$\frac{X_{N,T} \quad \mu\sqrt{N}}{\sqrt{v}} \Rightarrow N(0,1)$$

where $X_{N,T}$ is the corresponding from of the test statistics while μ and v are the mean and variance of each test respectively.

Traditionally, to test for the causal relationship between two variables the standard Granger (1969) test has been employed in the relevant literature. The test states that, if pass value of a variable Y significantly contribute to forecast the value of another variable X_{t+1} then Y is said to Granger cause X and vice versa. In this study, Granger causality test was employed to test whether VAT revenue granger causes private consumption. The test was based on the following regression.

$Y_t = \boldsymbol{\beta}_o + \sum_{k-1}^{m} \beta_k Y_{t-k} + \sum_{i-1}^{N} \alpha_i X_{t-1} U_t$ ..... (Equation 3.8)

$X_t = \gamma_o + \sum_{k-1}^{m} \gamma_k X_{t-k} + \sum_{i-1}^{N} \partial_i Y_{t-1} V_t$ ..... (Equation 3.9)

Where Y_t and X_t are VAT and consumption expenditure variables to be tested. U_t and V_t are mutually and correlated white noise errors, and t denotes the time period and 'k' and 'i' are number of lags.

The null hypothesis is $\alpha_i = \partial_t = 0$ for all I's versus the alternative hypothesis that $\alpha_i \neq 0$ and $\partial_i \neq 0$ for at least some i's. If the coefficient α_i's are statistically significant but ∂_i 's are not then X causes Y. in the reverse case, Y causes X. But if both α_i and ∂_i are significant, the causality runs both ways.

4. Results and Discussions

4.1 Panel Unit Root Estimates and Cointegration Test between VAT and Consumption

The results of the IPS test at level and first difference are presented in table 4.1. The IPS test statistics (ADF- Fisher and PP-Fisher chi-square) series of the variables are less than critical values of (1%), 5% and (10%) level. This shows that the variables series have no unit root. However, further unit root test of the variables showed the variable is stationary at first difference.

Table 4.2 Panel Unit Root using LLC & IPS (Levin, Lin & Chin t, and Im, Pesaran & Shin N-stat)

Method	VAT		CONSUMPTION	
	Level	First difference	Level	First difference
Levin Lin & Chin t**	0.03894-2.877**	-0.38050		-9.93571**
Im, Pesaran & Shin N-Stat	133.064**	104186**		37.9337169.388**
ADF-Fisher Chi-square	163.396**	269.776**		50.7768422.232**
PP-Fisher Chi-square				

** - significant at 10%

Source: Field Survey (2013).

4.2 The Pedroni Panel Cointegration Test

Since the variables are found to be integrated in the same order *I* (1), panel Cointegration tests are carried out for constant and constant plus time trend and the summary of the results of cointegration analysis are presented in Table 4.2. At constant level, we found that 4 out of 7 statistics rejected the null hypothesis of no cointegration at the 5 percent level of significance for the panel *v* statistics, panel rho –statistics, panel pp-statistics non- parametric and group PP–Statistic (non- parametric). Thus, the results of the panel co- integration tests in the model with constant level shows that VAT and consumption variables are co- integrated in the long run for the sampled states under study. In the panel co integration test for the model with constant plus trend level, the results indicate that 6 out of 7 statistics rejected the null hypothesis of non co-integration at 5 percent level of significance. It is shown that VAT and consumption variables do hold co integration in the long run for the sampled states. However, since the statistics conclude in favour of co integration, and this, combined with the fact that according to Pedroni (1999) the panel non-parametric (*t*-statistic) and parametric (*adf*-statistic) statistics are more reliable in

constant plus time trend, it is concluded that there is long run co integration among the two variables.

Table 4.2: The Pedroni Panel Cointegration Test

Test	Constant		Constant + Trend	
	Stat	**Prob.**	**Stat**	**Prob.**
Alternative hypothesis: common AR coefs. (within-dimension)				
Panel *v*-Statistic	1.4384*	0.0752	-0.045667	0.5182
Panel *ρ*-Statistic	-1.3819*	0.0835	-0.012899	0.4949
Panel *t*-Statistic: (non-parametric)	-3.2296***	0.0006	-3.15855***	0.0008
Panel *t*-Statistic (*adf*): (parametric)	1.041218	0.8511	-0.218001	0.4137
Alternative hypothesis: common AR coefs. (between-dimension)				
Group *ρ*–Statistic	0.353314	0.6381	0.977004	0.8357
Group *t*-Statistic: (non-parametric)	-3.9183***	0.0000	-3.57612***	0.0002
Group *t*-Statistic (*adf*): (parametric)	-0.297834	0.3829	-0.941091	0.1733

Significant at *** 5%: ** 10%: * 1% respectively.

Source: Field Survey(2013)

Note: All statistics are from Pedroni's procedure (1999) where the adjusted values can be compared to the N(0,1) distribution. The Pedroni (2004) statistics \are one-sided tests with a critical value of -1.64 (k < -1.64 implies rejection of the null), except the *v*-statistic that has a critical value of 1.64 (k > 1.64 suggests rejection of the null).

4.3 Vector Auto Regression Estimates of VAT and Consumption Expenditure

The result of the vector Auto regression estimates are presented in Table 4.3 Considering the VAT regression, individually, VAT at lag 1 and consumption expenditure at lag 3 are statistically significant (P < 0.05). Turning to the consumption expenditure regression, only the lag 1 of consumption expenditure is statistically significant (at 10 percent), whereas none of the

lagged VAT variable is significant. For comparative purposes, the VAR based on only 2 lags of each endogenous variable is estimated and the result presented in Table 4.3.

In order to make a choice between the model given in Table 4.3 and that given in Table 4.4, the Akaike and Schwarz information values are considered. This is essential since including too many lagged terms will consume degrees of freedom, not to mention introducing the possibility of multicollinearity which can only be solved with the use of log, while including too few lags will lead to specification error (Gujarati, 2007). Thus, Akaike and Schwarz information that gives the lowest values of these criteria is better. The Akaike and Schwarz information value for the model in Table 4.6 are respectively, 1.198 and 1.618, whereas the corresponding value for Table 4.4 are, respectively, 0.981 and 1.192. Since the lowest the values of Akaike and Schwarz statistics, the better the model, on that basis it seems the more parsimonious model given in Table 4.3 is preferable.

The results in Table 4.3 shows the VAR results based on only 2 lags of each endogenous variable. In the VAT regression model, it is observed that only the 1- lag VAT and 1-lag consumption terms are individually statistically significant at 5% level. This implies that rate of VAT is a function of consumption level. In the consumption regression, individually, both consumption expenditure at lag 1 and 2 is positive and statistically significant at 5% level whereas none of the two lagged VAT variable is individually statistically significant at 5% level. The result implies that current consumption level is positively affected by consumption level in the previous years.

Table 4.3: Vector Auto Regression (VAR) estimates based on 4 lags

	VAT	Consumption
VAT (-1)	0.671173 (0.21027) [3.19192]***	0.235230 (0.28292) [0.83144]
VAT (-2)	-0.061812 (0.25589) [-0.24156]	-0.264199 (0.34429) [-0.76737]
VAT (-3)	0.048938 (0.22487) [0.21762]	0.131327 (0.30256) [0.43405]
VAT (-4)	-0.036265 (0.14761) [-0.24568]	0.034566 (0.19861) [0.17404]

Consumption (-1)	0.034214 (0.15702) [0.21789]	0.402587 (0.21127) [1.90555]**
Consumption (-2)	0.000872 (0.15928) [0.00548]	0.251769 (0.21431) [1.17476]
Consumption (-3)	0.358873 (0.14971) [2.39709]***	0.271804 (0.20143) [1.34934]
Consumption (-4)	-0.125568 (0.16266) [-0.77195]	-0.100701 (0.21886) [-0.46012]
C	0.674707 (0.32322) [2.08749]***	0.140634 (0.43488) [0.32338]
R-squared	0.967022	0.958560
Adj. R-squared	0.954458	0.942773
Sum sq. resids	3.194396	5.782886
S.E. equation	0.390018	0.524762
F-statistic	76.97270	60.71978
Log likelihood	-8.971165	-17.87374
Akaike AIC	1.198078	1.791583
Schwarz SC	1.618437	2.211942
Mean dependent	5.983548	5.729135
S.D. dependent	1.827599	2.193634
Determinant resid covariance (D.of.adj)		0.040653
Determinant resid covariance (D.of .adj)		0.019920
Log likelihood		-26.39574
Akaike information criterion		2.959716
Schwarz criterion		3.800434

Significant at *** 5%: ** 10% respectively.

Source: Field Survey (2014)

Table 4.4 Vector Auto Regression (VAR) estimate based on 2 LAGS

	VAT	CONSUMPTION
VAT (-1)	0.744848 (0.15242) [4.88696]***	0.194338 (0.19706) [0.98617]
VAT (-2)	0.023395 (0.13255) [0.17649]	-0.096655 (0.17138) [-0.56396]

Consumption (-1)	0.428159 (0.10910) [3.92446]***	0.558716 (0.14106) [3.96080]***
Consumption (-2)	0.035045 (0.10794) [0.32466]	0.292733 (0.13956) [2.09749]***
C	0.467792 (0.22015) [2.12483]***	0.258783 (0.28465) [0.90914]
R-squared	0.965494	0.958362
Adj. R-squared	0.961550	0.953603
Sum sq. resids	4.863032	8.129418
S.E. equation	0.372752	0.481943
F-statistic	244.8263	201.3932
Log likelihood	-14.61319	-24.88974
Akaike AIC	0.980660	1.494487
Schwarz SC	1.191770	1.705597
Mean dependent	5.994561	5.727973
S.D. dependent	1.900954	2.237438
Determinant resid covariance (D.of.adj)		0.030977
Determinant resid covariance		0.023716
Log likelihood		-38.68333
Akaike information criterion		2.434166
Schwarz criterion		2.856386

*** - significant at 5%

Source: Field Survey (2013)

5.2. Conclusion

Based on the findings of the study, VAT has the potential to positively enhance revenue generation of the sampled states as the result from the study affirmed that VAT had a significant impact on the revenue profiles of the sampled states. Consumption was found to be relevant to increased VAT revenue generation, as increased VAT rate granger caused increased household consumption expenditure only. The result of the test clearly indicates that increase in VAT

necessitate an increase in the consumption expenditure only. The granger causality test is unidirectional.

5.3 Recommendations

From the conclusion of the study, it is recommended that;

- The Federal Inland Revenue Service (FIRS), as the regulatory authority of VAT, should fully analyse the effect of increased VAT rate on the people whenever government desire increased revenue as increased VAT rate granger cause increase in the consumption expenditure of the people.
- Deliberate policies to adequately train the tax authority staff on tax assessment through provision of manual of tax procedures should be put in place by the FIRS to minimise avoidance through underassessment of VAT payable.

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