

Trade Liberalization and Trade Tax Revenue in Nigeria: Does Causality Exist?

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Abstract

Over the years, there has been unresolved debate in the literature and studies have generated mixed results on the direction of influence between trade liberalization and trade tax revenue. Against this background, this study examined the causal nexus between trade liberalization and trade tax revenue in Nigeria with data spanning 1986 to 2014 with a view to determining whether there is any complementarity between trade policy and revenue generation drive of the Nigerian government. Utilizing a bi-variate VAR model, the study observed a unidirectional causation from trade tax revenue to trade liberalization. Base on this finding, the study recommended the need for efficient implementation and functioning of trade policy and to de-emphasize the focus on crude-oil in order to ensure the successful performance of trade liberalization policy. In addition, the implementation of the trade liberalization policy should be guided to mitigate any adverse consequence.

Keywords: Trade liberalization; Trade tax revenue; VAR; Causality; Nigeria

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Introduction

The influence of trade liberalization on government revenue via trade tax revenue has been a subject of academic discourse among researchers. The importance of trade liberalization as an vital source of revenue generation (through trade tax) is drawn from the experience of countries that have implemented trade liberalization; For instance, revenue from trade tax accounts for over one-third of the government revenue in most sub-Saharan Africans countries while in Asia and the pacific, trade tax revenue accounts for over fifteen per cent of the government revenues (Baunsgaard and keen, 2005). In

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spite of foregoing, there exist controversies in the literature on the direction of influence between trade liberalization and trade tax revenue. Studies (such as Peters, 2002; Pritchett and Sethi, 1999; Agbeyegbe et al, 2004) argued that trade liberalization does not influence trade tax revenue. These studies argued that trade liberalization often leads to reduction in import tariffs, and consequently brings about a drop in trade revenue, especially for small open economies like Nigeria where trade tax revenue depends heavily on international trade. Contrarily, Ebrill et al (1999) and Khattry and Rao (2002) pointed out that trade liberalization influences trade tax revenue. According to these authors goods which are restricted by quotas are usually tariff imposed, the removal of quotas and reduction of tariffs lead to substantial increase in trade volumes and a decrease in the incentive to evade taxes; consequently resulting in higher trade revenue. In the light of this conflicting evidence, it is pertinent to carried out a country specific analysis by examining trade liberalization and trade tax revenue nexus in Nigeria. More so, given the increased drive of the government to diversify the revenue base of the nation especially in the face of incessant instability and the current nosedive of international crude oil price which has frequently resulted in fiscal instability; it is pertinent to examine the link between trade liberalization and trade tax revenue. In addition, as the country prepares to join the top 20 economies in 2020 through the achievement of an expected annual economic growth rate between 13-15 per cent, it is also pertinent to evaluate the causal nexus between trade liberalization and trade tax revenue. This would provide justification on the likely contributory influence of trade liberalization on revenue generation from trade tax in the attainment of vision 20:2020.

In addition to the introductory section, the paper has five parts. Section two reviewed existing literature on trade liberalization and trade tax revenue while section three presented the research methodology. Section four discussed the empirical results while section five concluded with policy implications.

Literature Review

It's no doubt that a great deal of literature has dealt on the individual effects of trade liberalization and trade tax revenue on various macroeconomic variables while a few have examined the empirical relationship between trade liberalization and trade tax revenue. These studies failed to examine the direction of nexus between trade liberalization and trade tax revenue. Some of these studies are reviewed herein.

Jaffri et al. (2015) examined the relationship between trade liberalization and tax revenue in Pakistan for the period 1982-2013. Utilizing ARDL method, the study observed a positive relationship between trade liberalization and total tax revenue in Pakistan over the study period. The short run regression estimate showed that the coefficient of lagged error term (ECM_{t-1}) was negative and significant, suggesting speed of convergence to long-term equilibrium. Okodua and Alege (2014) examined the various household welfare scenarios that will result from the imposition of shocks on import taxes in the Nigerian economy. The study employed computable general equilibrium model based on a 2006 social accounting matrix for Nigeria to conduct a macro-micro simulations of the economy. The results of the study showed that full or partial trade liberalization policy in Nigerian will have a mixed welfare implications for Nigerian

households in the short run. While the policy will lead to a general improvement in consumption of goods and services as well as in real income of all households, it will at the same time hurt households by inducing unemployment in the two key sectors of agriculture and industry. The study recommends the need for a sectoral trade liberalization policy with emphasis sectors that will not severely undermine the welfare needs of Nigerian households.

Olaifa et al. (2013) examine the relationship between trade liberalization and economic growth in Nigeria for the period 1970 to 2012. Employing the ordinary least squares technique, the study observed that liberalization supports economic growth in Nigeria. The study also found to support a structural change taking place in 1986 with the adoption of free trade policy. Safdari et al. (2011) examined the effect of trade liberalization on gross domestic product in Iran over the periods 1973-2008. The study also examined the effect of other macroeconomic variables such as capital stock, active population, labor force and export on gross domestic product. Using a Vector Auto-regressive Model (VAR), the study observed that capital stock, active population and exports of goods and services have positive effect on gross domestic product while labor force and taxes on imports have a negative effect on gross domestic product. Thus, the study concluded that the effect of trade restrictions like tariffs, export expansion and the use of human capital can lead to the production growth because with trade liberalization, industry sector can be strengthened and to achieve high growth.

Zafar and Butt (2008) examined the relationship between external debt and the trade liberalization in Pakistan over the period 1972-2007. The study utilized the Auto-regressive Distributed Lag (ARDL) bounds testing approach to investigate the long run relationships and Error Correction Method (ECM) for short run dynamics. Consequent to the examination of the order of integration through the Augmented Dickey Fuller (ADF) and Phillips-Perron unit root tests, the findings of the study revealed a significant long run positive relationship between external debt and trade liberalization in Pakistan. Tosun (2005) examined the relationship between tax structure and trade liberalization in Middle East and North Africa region using a panel data on sixty-five countries for period covering 1980 to 1997. Using a fixed effect regression estimate the study found that unlike other non-OECD countries, the MENA countries did not increase their reliance on domestic consumption taxes in response to trade liberalization. The study further revealed that trade liberalization did not seem to have a strong impact on major revenue impact of the MENA countries.

Agbeyegbe et al. (2004) examined the relationship between trade liberalization, exchange rate changes and tax revenue in Sub-Saharan Africa using a panel of twenty-two countries for the period spanning 1980 to 1996. Utilizing a General Method of Moment Regression technique, the study found that the relationship between trade liberalization and tax revenue is sensitive to the measure used to proxy trade liberalization but that in general trade liberalization is not strongly linked to higher income tax revenue. The study therefore concluded that trade liberalization accompanied by the appropriate macroeconomic policies can be undertaken to enhance overall revenue yield. Matlanyane and Harmse (2002) examined the revenue implication of trade liberalization in South Africa using an Ordinary Least Square (OLS) estimation technique for data covering 1974

to 2000. The study found that trade liberalization had significant influence on custom revenue and that increase in import may lead to a reduction in trade tax revenue. The study therefore suggested that supportive macroeconomic policies are a prerequisite for successful effect of trade liberalization of trade tax revenue. Ogundele (2001) examined the effect of trade liberalization on exports of fish and shrimps in Nigeria. The author developed a short run-forecasting model to predict the quantities of fish and shrimps that could be exported within a three-year period (1999-2001). The effect of liberalization was examined with the aid of an econometric model, which was estimated empirically. The finding of the study revealed that the liberalization policy of exchange rate adjustment is an important factor affecting fish and shrimps export. The study also suggested that, real depreciation or appreciation of the naira for example, tends to stimulate farmers to increase or decrease supply for fish and shrimps exports thus taking advantage of the improved international competitiveness.

Olomola (1998) examined the effect of market liberalization on Nigerian agriculture. On the one hand, the study examined whether the adopted liberalization policies is effective in boosting agricultural exports, aggregate food supply and agricultural terms of trade as expected after the introduction of SAP. On the other hand, the study also examined the effect of liberalization policies on the declining foreign exchange earnings; deteriorating balance of payments and heavy debt serving burden. This was with a view at finding out the sort of changes in agricultural protectionism that have occurred under liberalization. The unfolding results of the study indicated that the economic policy measures adopted in the period of 1970 to 1990 provided positive incentive especially for food crop production and that the degree of protection during liberalization (1986-90) was significantly lower than the degree of protection prior to liberalization (1970-1985).

As argued in the introduction of the literature review, previous studies have focused on the effect of trade liberalization on trade tax revenue. However, the concern of this paper is quite different. It is not with the impact of trade liberalization (in terms of magnitude or sign) on trade tax revenue but on the causal nexus between trade liberalization and trade tax revenue. Surprisingly, this question has received almost no empirical attention in the literature. This study therefore aims at filling this gap by examining the direction of causality between trade liberalization and trade tax revenue in Nigeria for the period 1986 to 2014.

Research Methodology

Model Specification

Although most econometric models on the relationship between trade liberalization and trade tax revenue use economic theory as a basis for constructing the relationship between the variables. However, this has limitations in providing dynamic specifications that identifies all the relevant relationships. A non-structural approach such as the VAR provides an alternative system to traditional structural models in capturing the dynamic relationship between trade liberalization and trade tax revenue. The VAR approach allows us to sidestep the need for a theoretical structural model by treating all endogenous variables in the system as a function of the lagged values of all the endogenous variables



in the system (Amarakoon, 2009). In view of the above, to examine causal nexus between trade liberalization and trade tax revenue, we estimate a standard VAR causality model of the form:

$$OPNX_t = \sum_{i=1}^m \alpha_{11} OPNX_{t-i} + \sum_{i=1}^n \alpha_{12} TRDREV_{t-i} + U_{1t} \dots\dots\dots (1)$$

$$TRDREV_t = \sum_{i=1}^m \alpha_{21} OPNX_{t-i} + \sum_{i=1}^n \alpha_{22} TRDREV_{t-i} + U_{2t} \dots\dots\dots (2)$$

where: *OPNX* is trade openness used to proxy trade liberalization; *TRDREV* is trade tax revenue and U_{1t} and U_{2t} are the disturbances term assumed to be uncorrelated with white noise properties $N(0, \sigma^2)$. From equation (1) and (2), there are four possible null hypotheses:

Case 1: Unidirectional causality from OPNX to TRDREV. This is indicated if $\sum \alpha_i \neq 0$ and $\sum \delta_j = 0$

Case 2: Unidirectional causality from TRDREV to OPNX. This is indicated if $\sum \alpha_i = 0$ and $\sum \delta_j \neq 0$.

Case 3: Bilateral causality. This is indicated if $\sum \alpha_i \neq 0$ and $\sum \delta_j \neq 0$.

Case 4: Independence. This is indicated if $\sum \alpha_i = 0$ and $\sum \delta_j = 0$.

In estimating the VAR causality model of (1) and (2) above, Engel-Granger (1987) cautioned that the Granger causality test, which is conducted in the first differences of variables through a vector auto-regression (VAR) will be misleading in the presence of co-integration. Therefore, an inclusion of an additional variable to the VAR system, such as the error correction term would help capture the long run relationship among the variables. Thus, in the event of co-integration between the variables, an augmented form of granger causality test involving the error correction term is formulated in a bi-variate *p*th order vector error-correction model (VECM) as follows (Ferda, 2007).

$$\begin{bmatrix} \Delta OPNX_t \\ \Delta TRDREV_t \end{bmatrix} = \begin{bmatrix} \phi_{10} \\ \phi_{20} \end{bmatrix} + \sum_{i=1}^p \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix} \begin{bmatrix} \Delta OPNX_{t-i} \\ \Delta TRDREV_{t-i} \end{bmatrix} + \begin{bmatrix} \lambda_1 \\ \lambda_2 \end{bmatrix} [ECT_{h,t-1}] + \begin{bmatrix} u_{1t} \\ u_{2t} \end{bmatrix} \dots (3)$$

where $ECT_{h,t-1}$ is the error correction term, the residual from the *h*th co-integration equation, lagged one period; and in the absence of co-integration among the variables equation (1) and (2) is estimated for causality test.

Data Measurement and Source

Data on trade liberalization (proxy by trade openness (OPNX))² and trade tax revenue were sourced from the Central Bank of Nigeria Statistical bulletin. Trade openness is estimated as the ratio of import plus export to gross domestic product (GDP).

Empirical Result

Unit Root Test

An estimation of the nexus between trade liberalization and trade tax revenue requires appropriate estimation techniques prior to the estimation of VAR or VECM models. Thus, this study takes the first step by examining the properties of the time series before carrying out co-integration test. Using Augmented Dickey-Fuller (ADF) and Phillip-Perron test, table 1 revealed that the variable were non-stationary at 5 per cent level of significance in their level form, thus leading to test at first differences, which revealed that all the variables were stationary at first difference, that is, integrated of order one I(1).

Table 1: Unit Root Test

Augmented Dickey-Fuller (ADF) Test				Phillip-Perron (PP) Test		
Variables	Level	1 st Difference	Status	Level	1 st Difference	Status
opnx	1.4974	-7.8578*	I(I)	1.3189	-7.8282*	I(1)
trdrev	-0.6956	-6.5306*	I(1)	-0.6956	-6.5293*	I(1)

Note: * implies stationarity at one percent level.

Co-integration Estimate

Although the unit root test revealed that the variables were integrated of order one, that is the variables are I(1) series. However, as shown on table 2, no evidence of co-integration was observed between trade liberalization and trade tax revenue. The result of the trace and maximum eigen-value tests indicated that, there exist no co-integrating vectors at 5% level of significance. This is because the critical values of the trace and eigen-value tests were greater than their statistics values.

Table 2: Summary of the Co-integration Estimate

Trace Test				Maximum Eigen value Test			
Null	Alternative	Statistics	95% critical values	Null	Alternative	Statistics	95% critical values
r=0	r≥1	65.7637	69.819	r=0	r=1	26.1673	33.877
r≤1	r≥2	39.5964	47.856	r≤1	r=2	18.1570	27.584
r≤2	r≥3	21.4394	29.797	r≤2	r=3	10.8343	21.132
r≤3	r≥4	10.6052	15.495	r≤3	r=4	8.2992	14.265

² Adam et al. (2001) and Ebrill et al. (1999) also employed trade openness as a proxy for the degree of trade liberalization.

$r \leq 4$	$r \geq 5$	2.3060	3.842	$r \leq 4$	$r = 5$	2.3060	3.841
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Granger Causality Test

Since the co-integrating result showed no evidence of co-integration (long run relationship) between the variables, the VAR model is estimated in first differenced using equations (1) and (2) rather than in Vector Error Correction Model (VECM) form as specified in equation (3). Table 3, presented the causality result between trade liberalization and trade tax revenue. Using the F-statistics and the probability values, the granger causality test result revealed a unidirectional causality running from trade tax revenue to trade liberalization and no evidence of feedback was observed from trade liberalization to trade tax revenue.

Table 4: Pairwise Granger Causality Estimate

Null Hypothesis:	F-Statistic	Prob.
LTRDREV does not Granger Cause OPNX	5.42483	0.0254
OPNX does not Granger Cause LTRDREV	2.28723	0.1389

Findings and Discussion

It was observed from the unit root test estimate that the variables were integrated of order one. However, no evidence of co-integration was observed between trade liberalization and trade tax revenue, implying that these variables have no long run relationship. The short run analysis, using the pairwise granger causality test showed a unidirectional causality running from trade tax revenue to trade liberalization and no evidence was observed otherwise. The finding of this study supported the findings by Peters (2002), Pritchett and Sethi (1999) and Agbeyegbe et al, (2004) that trade liberalization do not influence trade tax revenue. More so, the finding of this study is in contrast with studies by Ebrill et al (1999) and Khattry and Rao (2002) that trade liberalization influences trade tax revenue. A possible explanation for the unidirectional causation from trade tax revenue to trade liberalization is that; the need to diversify the revenue base of Nigerian economy from the oil sector through increased revenue share of the non-oil sector especially from trade tax could have influenced the adoption of trade liberalization policy in Nigeria.

Conclusion and Policy Recommendation

This study examines trade liberalization and trade tax revenue nexus in Nigeria. Although most related studies have examined the empirical effect of trade liberalization on trade tax revenue, these studies failed to examine the direction of influence between these variables. According to literature, the direction of causality between trade liberalization and trade tax revenue is ambiguous. However, the finding of this study revealed a unidirectional causation from trade tax revenue to trade liberalization and no feedback was observed. This study

concluded that the drive for increased trade tax revenue might have influenced the adoption of trade liberalization policy in Nigeria. Based on the above finding this study recommends that, to achieve higher revenue from trade tax, there is the need for the government to seek improvements in efficient implementation and functioning of trade policy and to de-emphasize the focus on crude-oil in order to ensure the successful performance of trade liberalization policy. In addition, the implementation of the trade liberalization policy should be guided to mitigate any adverse consequence.

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