GPH - JOURNAL OF AGRICULTURE & RESEARCH

AGRICULTURAL EXPORT AND ECONOMIC GROWTH IN NIGERIA

Kayode Oluwafemi[1] and Sylvester F. Udeorah[2]

[1 & 2] Institute of International Trade and Development & Department of Economic, University of Port Harcourt, Nigeria

Corresponding Author: slyefavor@gmail.com

A B S T R A C T

The study assessed agricultural trade and economic growth in Nigeria from 1985 to 2020. Annual data were collected from CBN statistical bulletins and the technique of auto regressive distributed lag model (ARDL) was used to determine the long run and short run relationship between the dependent and independent variables. The ARDL result showed that; an increase in agricultural exports will have insignificant positive impact on economic growth in Nigeria. Moreso, an increase in agricultural credit had positive and insignificant impact on economic growth. Again, it was observed that consumption expenditure had negative and insignificant effect on economic growth in the long run. In the short run, agricultural export and consumption expenditure promoted economic growth in Nigeria. Based on the study's findings, it was recommended that, Nigeria government should reignite its strategy of trade opening and economic diversification, especially her exports by encouraging productivity in the agricultural sector. There is the need to seek alternative financing such as agricultural insurance schemes, farmers cooperatives and encouragement of private involvement in agro-funding with less stringent credit conditions.

K E Y W O R D S

Agricultural Exports, Agricultural Credit, Economic Growth, Consumption Expenditure

1. Introduction

The external sector is important to the growth of an economy. This is because the external sector reflects the economic transactions between the residents of an economy and the rest of the world. One of the major indicators of external sector performance is trade. This trade not only includes goods and services but also trade in financial assets. Trade provides both foreign exchange earnings and market stimulus for accelerated economic growth. Thus, nations such as Hong-Kong and South Korea have achieved growth through trade (Tajudeen, 2012).

Nigeria with her vast mineral endowment particularly petroleum resources and rich agricultural base, at independence, was expected to have attained a rapid economic growth and development. This however has not been the case, as over reliance on crude oil created distortions in the Nigerian economy. Thus, agricultural trade in exports of cocoa, groundnuts and palm produce dropped; while agricultural trade in imports of finished products increased and this changed the structure of the external trade which invariably created imbalance in the economy.

Meanwhile, before the advent of crude oil in commercial quantities, the agriculture and the mining sectors were known to be the driven force of Nigeria's exports in the past. Thus, trade in the non-oil sectors accounted for more than 66% of Nigeria's total exports, and contributed immensely to the growth of Nigeria's economy in the 1960s (Matthew, Charles, Dorothy & Meanwhile, before the advent of crude oil in commercial quantities, the agriculture and the mining sectors were known to be the driven force of Nigeria's exports in the past. Thus, trade in the non-oil sectors accounted for more than 66% of Nigeria's total exports, and contributed immensely to the growth of Nigeria's economy in the 1960s (Matthew, Charles, Dorothy & Suleiman, 2017). But the neglect of the agricultural trade in exports for crude oil exports has created imports dependency on agricultural products in Nigeria. As a result, there has been increase in imported agricultural finished products such as staples food over the last three decades. This raises a lot of concern on agricultural imports and their impact on economic growth. Also, the increase in domestic demand for diversified and more quality products resulting from increased incomes coupled with low agricultural productivity has further led to increase in agricultural imports. Thus, high rate of agricultural imports that surpass agricultural exports has been raising concerns on agricultural trade in Nigeria, since over reliance on agricultural imports threatens the growth of the economy in terms of unfavorable balance of payments, low employment in agriculture sector and consequently the potential role of agriculture sector in poverty reduction. These identified problems, motivate the conduct of this study.

The study consists of five sections: Section 1 introduced the study, objectives and the problem which the study intended to solve. Section 2 presents the review of literature related to the study. Section 3 covers the methodology adopted in achieving the objective of the study. Section 4 and 5 discuss the results, conclusion and recommendation of the study.

2. Literature Review
Theoretical Literature
The Export-led Growth Theory

The export-led growth hypothesis which is the main determinant of overall economic growth of any country has its main arguments based on the fact that export growth may affect total factor productivity through dynamic spillover effects on the rest of the economy. The theoretical rationale for this hypothesis hinges on a number of arguments which include the following: first, that the export sector may generate positive externalities on non-export sectors through more efficient management styles and improved production techniques (Jhingan, 2011; Lipsey & Chrystal, 2011). Second export

expansion will increase productivity by offering potential for scale economies. Third, exports are likely to alleviate foreign exchange constraints and can thereby provide greater access to international markets.

According to the theory, an expansion in exports may promote specialization in production of export products which in turn may boost productivity levels and may cause the general level of skills to rise in the export sector. This then leads to a reallocation of resources from the (relatively) inefficient non-trade sector to the higher productive export sector. This productivity change leads to output growth (Mankiw, 2009).

Balanced Growth Theory

The balance growth theory is an economic theory pioneered by the economist Ragnar Nurkes (1907–1959). The theory hypothesized that the government of any developing or underdeveloped country needs to make large investment in a number of sectors simultaneously. This will enlarge the market size, increase productivity and provide an incentive for the private sector to invest. Thus, Ragnar Nurkse was in favour of attaining balanced growth in both the industrial and agricultural sectors of the economy. He recognized that the expansion and inter-sectoral balance between agriculture and manufacturing is necessary so that each of these sectors provides a market for the products of the other and in turn, supplies the necessary raw materials for the development and growth of the other.

Empirical Literature

Ouma, Kimani and Manyasa (2016) study the relationship between agricultural trade and economic growth in the East Africa community using vector autoregressive and vector error correction models. They find bidirectional causality between agricultural exports and economic growth in Kenya, unidirectional causality in Rwanda, and no causality in the case of Tanzania, Uganda, and Burundi.

Nahanga and Bečvářová (2016) use Granger causality and impulse response in their analysis and report that agricultural exports support economic growth in Nigeria. Also, Bakari and Mohamed (2018) investigate the effect of agricultural trade on economic growth of North Africa. They reported that agricultural exports have a positive effect on GDP, but agricultural imports have no effect on economic growth.

Bakari and Mabrouki (2017) investigated the nexus between exports, imports and economic growth in Panama for the periods between 1980 and 2015. Their empirical analyses (by using VAR Model) showed that exports and imports cause economic growth. In their conclusion, they confirm that the reason of these results is the strong strategy in customs barriers, benefited by a lot of several international agreements and take advantage of its strategic location.

Bakari (2017) examined empirically by using the VECM Model the relationship among exports, imports and economic growth in Tunisia. In the long run, he found that the total of exports affects negatively economic growth, however, he found that total of imports affect positively economic growth.

Ghimire, Lin and Zhuang (2021) empirically examine the impacts of agricultural trade on economic growth and agricultural environmental pollution in Bangladesh from 1972 to 2019 with the use of Auto Regressive Distributed Lag (ARDL) model with a structural break to examine the long-run and short-run determinants of agricultural environmental pollution in Bangladesh. The ARDL bounds

analysis methodology showed that it does not support the hypothesis that agricultural trade led to environmental pollution in the long-run.

Sayef and Mohamed (2018) investigated the influence of agricultural exports and agricultural imports on economic growth in North Africa Countries for the period 1982-2016 using correlation analysis and the static gravity model. Empirical analyses showed that agricultural trade has a positive correlation with gross domestic product, but it appears that agricultural exports and gross domestic product have a weak correlation.

Siaw, Jiang, Pickson and Dunya (2018) examined the correlation between agricultural exports and economic growth in Ghana at the disaggregate level using the Autoregressive Distributed Lag (ARDL) model with yearly time series data spanning from 1990Q1-2011Q4. Both the long-run and the short-run results revealed that, cocoa export has a positive and significant impact on economic growth whiles the export of pineapple and banana has negative effect on economic growth.

Mwangi, Chen and Njoroge (2020) investigated the causal links among agricultural imports, agriculture productivity, and economic growth in 40 sub-Saharan African countries over the period 1990–2015. Granger causality tests was applied to infer direction of causality, and model estimated using the generalized two-stage least squares instrumental variable technique. The results reveal bidirectional causality between agricultural imports and agriculture productivity in the full sample, and in middle- and low-income nonoil-exporting countries.

Uslu (2016) studies the causal link between imports and growth in Turkey for the period 1998–2014 and finds positive causality running from imports to GDP growth. Also, Guntukula (2018) reports a bi-directional causality between imports and economic growth in India. Abreha (2019) investigated the causal relationship between imports and firm productivity in Ethiopia and recorded productivity gains from import.

Aluko and Adeyeye (2020) use Granger causality to test causality between imports and economic growth in Africa. They report unidirectional causality running from imports to economic growth in some countries, whereas in other countries they find unidirectional causality running from economic growth to imports.

Oluwatoyese, Applanaidu and Abdulrazak (2016) examined the nexus between agricultural export, oil export and economic growth in Nigeria for the period between 1981 and 2014. In their analysis, they applied the cointegration analysis and vector error correction model to attempt their aim. Empirical analysis show that in the long run agricultural export and oil export cause economic growth, however, only oil export can cause economic growth in the short run.

Uremadu and Onyele (2016) examined empirically the impact of total agricultural exports, exports of cocoa and exports of rubber on economic growth in Nigeria from 1980 to 2014. They found that only total agricultural exports have a positive effect on economic growth.

3. Data and Methodology
Data
This study used annual data from 1985 to 2020 in examining the impact of agricultural export on economic growth in Nigeria. The data were for real gross domestic product (RGDP), agricultural export (AXP), agriculture, agricultural credit/loan (ACR) and consumption expenditure (CEX). The

source of the data was mainly the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics and World Bank database.

Methodology

The issue of stationarity of series has become paramount in economic modelling, as the presence of unit root in a series may result in spurious regression. Apart from this, determining the integration process of the employed variables is instrumental, as it informs on the appropriate method to apply in estimating a specified model. In lieu of this, this study test for unit root based on the augmented Dickey-Fuller (ADF) test. To determine if there is cointegration between economic growth, agricultural export, agricultural credit and consumption expenditure, the bound test method of Pesaran, et al., (2001) was used. Due to the outcome of the test which showed that agricultural credit/loan (ACR) is stationary in level, while other variables are I(1) series, the autoregressive distributed lag (ARDL) was employed for model estimation.

Model Specification

The model for the study was based on production function model and was specified in line with the model proposed by Sayef and Mohamed (2018) whose study focused on North African countries. The model that established the relationship between agricultural export and economic growth is stated below:

$$RGDP = f(AXP, ACR, CEX) \qquad (1)$$

The econometric specification of equation (1) becomes:

$$lnRGDP_t = \theta_0 + \theta_1 lnAXP_t + \theta_2 lnACR_t + \theta_3 lnCEX_t + \varepsilon_t \qquad (2)$$

From economic theory, it is expected that $\theta_1 - \theta_3 > 0$. By this, all variables are expected to contribute positively to economic growth.

With autoregressive distributed lag (ARDL) method employed, the specification of equation (2) in ARDL framework is given thus:

$$\Delta lnRGDP_t = \varphi_0 + \sum_{j=1}^{p} \varphi_1 \Delta lnRGDP_{t-j} + \sum_{j=0}^{q} \varphi_2 \Delta lnAXP_{t-j} + \sum_{j=0}^{q} \varphi_3 \Delta lnACR_{t-j} + \sum_{j=0}^{q} \varphi_4 \Delta lnCEX_{t-j}$$
$$+ \vartheta_1 lnRGDP_{t-1} + \vartheta_2 lnAXP_{t-1} + \vartheta_3 lnACR_{t-1} + \vartheta_4 lnCEX_{t-1} + \varepsilon_t \qquad (3)$$

The short run parameters are $\varphi_1 - \varphi_3$, while $\vartheta_1 - \vartheta_3$ represent the long run parameters; p and q are lag lengths determined by Alkaike Information Criterion (AIC).

4. Results and Discussion

Table 1: Descriptive Statistics

	RGDP	AXP	ACR	CEX
Mean	3451808	351.1000	35533.90	18733.54
Median	2447791	94.7500	32611.00	10625.09
Maximum	6981002	1434.200	244495.0	65399.01
Minimum	203532.0	0.5000	3337.000	20.3600
Std. Dev	2282500	450.3801	38655.29	19144.42
Skewness	0.3894	0.9446	4.4958	0.6514
Kurtosis	1.7143	2.3888	25.1600	2.2842
Jarque Bera	3.3893	5.9140	857.8750	3.3148
Prob.	0.1836	0.0519	0.0000	0.1906
Obs.	36	36	36	36

Source: Authors' compilation (2023)

Table 1 indicate that the approximate mean of real gross domestic product (RGDP) is N3451808; while the corresponding standard deviation is 2282500. On the other hand, the approximate mean of agricultural exports (AXP) is 351.1; while the corresponding standard deviation is 450.38. The approximate mean of agricultural credit (ACR) is 35533.90, while the corresponding standard deviation is 38655.29. Similarly, the approximate mean of consumption expenditure in agriculture (CEX) is 18733.54 while the corresponding standard deviation is 19144.42. The standard deviation statistics revealed large variation in real GDP, agricultural credit (ACR) and consumption expenditure (CEX), with mild variation observed in agricultural export (AXP). RGDP, AXP and CEX were deemed to be platykurtic relative to normal, as their kurtosis statistics were less than 3. Meanwhile, agriculture credit (ACR) has leptokurtic distributions relative to normal. The null hypothesis of normal distribution was rejected for agriculture credit at 5% level. Real GDP, agricultural export and consumption expenditure were normally distributed. The result on ACR may result from presence of unit root. Hence, the need to determine stability of the series using the ADF method.

Table 2: Unit Root Result

Variable	ADF				I(d)
	Level	5% Critical Value	1st Diff	5% Critical Value	
ACR_t	-6.0690**	-2.9484	-	-	I(0)
$RGDP_t$	0.0918	-2.9484	-8.7511***	-2.9484	I(1)
AXP_t	-0.2718	-2.9484	-5.4493***	-2.9484	I(1)
CEX_t	-2.7901	-2.9484	-6.9887***	-2.9484	I(1)

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively
Source: Authors' compilation (2023)

The test of stationarity via the Augmented Dickey Fuller (ADF) unit root test for the variables in the estimated model showed that only one variable (agricultural credit) was stationary at level or order zero. This is because the ADF test statistic value is greater than the critical value at 5%. However, variables such as RGDP, AXP and CEX which were not stationary at level were differenced once and became stationary at first differences; 1(1). Given that some of the variables were integrated of order 1(0) and some 1(1); the requirement to fit in an ARDL model to test for long run relationship is satisfied.

Table 3: ARDL Bounds Test for the Estimated Model

Model		F-Statistic = 4.063413
F(AXP), (ACR), (CEX)		K = 4
Critical Values	Lower Bound	Upper Bound
10%	2.2	3.09
5%	2.56	3.49
1%	3.29	4.37

Source: Researcher's Computation Using E-views 12

The bound test for co-integration using real gross domestic product (RGDP) as the dependent variable showed that, the f-statistic value of 4.063413 is higher than the upper bound critical value of 3.49 at 5% level of significance using restricted intercept and no trend in specification for the model. The result showed that the explanatory variables as well as real GDP are bound by a long run relationship

in Nigeria. This means that, the variables included in the model shared long-run relationships among themselves.

Table 4: ARDL Long Run Result

Variable	Coefficient	Std. Error	t − stat.	Prob.
AXP_t	19797.04	16853.98	1.1746	0.2629
ACR_t	65.0708	40.3336	1.6133	0.1326
CEX_t	-37.5710	37.9304	-0.9905	0.3415
C	289524.6	892665.5	0.3243	0.7513

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively
Source: Authors' compilation (2023)

The estimated result showed that, there is a positive relationship between agricultural exports and economic growth in Nigeria during period under review. This means that, a unit increase in agricultural exports will bring about 19797.04 units increase in economic growth in the long run. Also, the increase in agricultural exports equally has insignificant impact on economic growth in Nigeria during the period of study. The finding negates the empirical work of Saeed and Hussain (2015) who studied the Tunisian economy and found that only imports promoted economic growth. It also failed to with Nahanga and Bečvářová (2016) who showed using Granger causality that agricultural export support economic growth in Nigeria.

Agricultural credit had positive relationship with economic growth during the period of study. Therefore, a unit increase in agricultural credit will cause about 65.0708 units increase in economic in Nigeria during the period of study. Also, the result shows that agricultural credit insignificantly impacts on economic growth in Nigeria during the period of study. This finding deviates from Dawson (2005) who established a positive link between agriculture credit and economic growth.

From Table 6, an increase in consumption expenditure will bring about 37.5710 units decrease in economic growth in the long run. Though the expected negative relationship between consumption expenditure and economic growth is not achieved, the relationship is insignificant. The finding failed to support that of Bakari (2017). Bakari (2017) established a positive and significant relationship between government expenditure and economic growth.

Table 5: ARDL Short Run Result

Variable	Coefficient	Std. Error	t − stat.	Prob.
$D(RGDP_{t-1})$	-0.3484**	0.1524	-2.2852	0.0413
$D(RGDP_{t-2})$	0.3176	0.2012	1.5779	0.1406
$D(AXP_t)$	7850.254***	1894.722	4.1432	0.0014
$D(AXP_{t-1})$	-9628.390***	2022.710	-4.7601	0.0005
$D(AXP_{t-2})$	-13564.92***	2661.607	-5.0965	0.0003
$D(ACR_t)$	28.3421***	5.2092	5.4407	0.0001
$D(ACR_{t-1})$	-26.5356***	6.6289	-4.0030	0.0018
$D(ACR_{t-2})$	-19.8501***	5.3296	-3.7244	0.0029
$D(ACR_{t-3})$	-10.3398**	3.7016	-2.7933	0.0162
$D(CEX_t)$	60.8705***	13.5902	4.4790	0.0008
ECM_{t-1}	-0.9516***	0.1619	-5.8769	0.0001
	$R^2 = 0.8830$		Adjusted $R^2 = 0.7867$	

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively
Source: Authors' compilation (2023)

From Table 5, the coefficient of ECM has the hypothesized negative sign and statistically significant at 5% level. Therefore, the deviations from the short-term in real GDP adjusted to long run equilibrium with the speed of 0.95167. This showed that the disequilibria in real GDP in the previous year were corrected for in the current year at a speed of 95.167percent. In the short run, agricultural export, agricultural credit and consumer expenditure had contemporaneous positive and significant on economic growth. The study observed negative and significant effect of agricultural export and agricultural credit on economic growth. However, these negative effects occur after one lag.

The parameters estimates were subjected to diagnostics test to determine their validity for predictions. These tests numbered four and include autocorrelation, normality, heteroscedasticity and stability tests. The summary of the tests is presented in Table 6. From the tests carried out, the probability value of the Breusch-Godfrey and ARCH Chi-square statistics are higher than 0.05. Hence, the study fails to reject the null hypothesis of homoscedasticity and serial independence. Likewise, the residuals were found to be normally distributed and the estimated coefficients stable over the period of study. These conclusions are based on the probability value of the Jarque-Bera statistics and the CUSUM plot from Figure 1.

Table 6: Model Diagnostic Result

Test	Null Hypothesis	Test Type	Test Stat.	Prob
Autocorrelation	Serially Independent	Breusch-Godfrey LM	0.8409	0.6567
Heteroscedasticity	Homoscedastic	Breusch-Pagan-Godfrey	18.4411	0.4932
Normality	Normally Distributed	Jarque-Bera	5.1553	0.0759
Stability	Stable Parameters	CUSUM	-	-

Source: Authors' computation (2023)
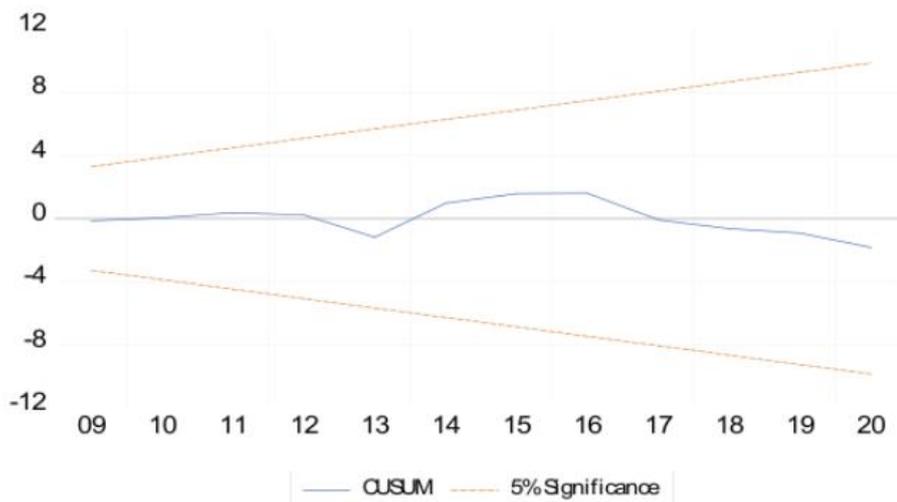
Figure 1: Cumulative Sum (CUSUM) Plot

5. Conclusion and Recommendations

The study assessed agricultural export and economic growth in Nigeria from 1985 to 2020. As Nigeria nation is making frantic effort to achieve increase economic growth, the contribution of agricultural trade vis-à-vis exports and imports trade play a key role in achieving sustained growth and development. In lieu of the above, data was collected on real GDP, exports trade in agriculture, credit to agriculture and consumption expenditure in agriculture. The collected data was analyzed with the technique of Auto Regressive Distributed Lag (ARDL) model. The study concluded based on

empirical result that; in the long-run, agricultural trade has long run relationship with economic growth.

In line with this, the following recommendations were made:

i. Nigeria should re-ignite its strategy of trade opening and economic diversification, especially her exports by encouraging productivity in the agricultural sector.

ii. Government should allocate more funding and as well grant sustained credit scheme to the agricultural sector in order to increase output and boost the growth of the Nigerian economy.

iii. There is need to seek alternative financing such as agriculture insurance schemes, farmers' cooperatives. Also, private involvement in agro-funding should be encouraged with less stringent credit conditions.

REFERENCES

Aluko, O.A., Adeyeye P.O. (2020). Imports and economic growth in Africa: Testing for granger causality in the frequency domain, *Journal of International Trade and Economic Development, 29*, 850–864.

Bakari, S. & Mabrouki, M. (2017). The effect of agricultural exports on economic growth in South-Eastern Europe: An empirical investigation using panel data, *Journal of Smart Economic Growth, 2*(4), 1-10.

Bakari, S. (2017). The three-way linkages between export, import and economic growth: New evidence from Tunisia, *Journal of Smart Economic Growth, 2*(3), 1-10.

Ghimire, A., Lin, F. & Zhuang, P. (2021). The impacts of agricultural trade on economic growth and environmental pollution: Evidence from Bangladesh using ARDL in the presence of structural breaks. *Sustainability 2021, 13, 8336.* https://doi.org/10.3390/s

Jhingan, M. L. (2011). International Economics 6th Edition, Vrinda Publication (P) LTD: Delhi.

Lipsey, R. & Chrystal, A. (2011) *Economics (Twelfth Edition),* Oxford University Press Inc New York.

Mankiw, N. G. (2009). Principles of macroeconomics (Fourth edition). South-Western Cengage Learning India.

Matthew, J. K., Charles K., Dorathy, P. N. & Suleiman, L. (2017). Contribution of nonoil exports to economic growth in Nigeria (1985-2015), *International Journal of Economics and Finance, 9*(4), 253-261

Mwangi, E.N., Chen, F. & Njoroge, D.M. (2020). Agricultural imports, agriculture productivity and economic growth in Sub-Saharan Africa, *Journal of African Trade, 7*(1-2), 15–28

Nahanga, V. & Bečvářová, V. (2016). The impact of agricultural exports on economic growth in Nigeria, *Acta Univ. Agric. Silvicult. Mendel. Brun. 64*, 691–700.

Oluwatoyese, O. P., Applanaidu, S. D. & Abdulrazak, N. (2016). Agricultural export, oil export and economic growth in Nigeria: Multivariate co-integration approach, *International Journal of Environmental & Agriculture Research, 2*(2), 1-16.

Ouma, D., Kimani, T. & Manyasa, E. (2016). Agricultural trade and economic growth in East African Community, *Africa Journal of Economic Review, 4*, 203–221

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.

Sayef, B. & Mohamed, M. (2018). The impact of agricultural trade on economic growth in North Africa: Econometric analysis by static gravity model, *Munich Personal RePEc Archive (MPRA.* Online at https://mpra.ub.uni-muenchen.de/85116/ MPRA Paper No. 85116, posted 11 Mar 2018 22:39 UTC)

Siaw, A., Jiang, Y.S., Pickson, R.B. & Dunya, R. (2018). Agricultural exports and economic growth: A disaggregated analysis for Ghana. *Theoretical Economics Letters, 8*, 2251-2270. https://doi.org/10.4236/tel.2018.811147

Tajudeen, E. (2012). External borrowing and economic growth in Nigeria. *Pakistan Journal of Social Sciences. Retrieved from* www.medwelljournals.com.

Uremadu, S. O., Onyele, K. O. & Ariwa, F. O. (2016). The impact of selected agricultural exports on the growth of the domestic economy, *Prime Journal of Business Administration and Management, 6*(3), 2035-2046.

Uslu, C. L. (2016). Cointegration and causality between Turkish, imports and GDP: a structural analysis, *European Journal of Economics and Finance, 4*, 91–100.