ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume 64 198 Number 5, 2016
http://dx.doi.org/10.11118/actaun201664051805

ANALYSIS OF EXTERNAL INFLUENCES ON AGRICULTURAL PERFORMANCE IN NIGERIA

Nahanga Verter[1]

[1] Faculty of Regional Development and International Development Studies, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

Abstract

VERTER NAHANGA. 2016. Analysis of Some External Influences on Agricultural Performance in Nigeria. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 64(5): 1805–1821.

The persistent slump in crude oil prices on the world market has drastically reduced government revenues, weakened currencies, and threatened growth and development of countries such as Nigeria that are heavily dependent on petroleum as a source of government earnings. Therefore, it has become imperative for the government to look beyond oil, notably agriculture to survive the present shocks. Given that agriculture is the largest non-oil export in Nigeria, this paper assesses the general performance of agriculture in the country. The article also verifies the relationship between trade, external financial flows and agricultural performance in the country, using Granger causality, IRF and VDA as well as descriptive approaches. The Granger test results reveal a unidirectional causality running from imports, openness, world prices of primary agrarian products, agricultural ODA to agricultural performance in Nigeria. The VDA results also show that a shock to agricultural exports, imports and openness can contribute to the fluctuation in the variance of agricultural performance in the country. The response of agricultural import to production records negative in almost all the periods investigated. This suggests that a substantial import in Nigeria might have hurt agricultural production in the country. The government of Nigeria should as a matter of urgency, invest heavily in agricultural production and encourage producers for domestic value added for local consumption and export. Also, more FDI and ODA should be channelled to agricultural related activities in the country. Domestic producers and exporters should be protected against foreign competitors in some commodities that can be produced cheaply at home.

Keywords: export, import, trade openness, performance, agricultural ODA

INTRODUCTION

The movement of goods, people and financial resources across national borders, especially in the last six decades has been intensified. Globally, many economies, world organisations and scholars have embraced foreign trade (Krugman, Obstfeld and Melitz, 2010; Shirazi and Manap, 2005) and external financial flows (Chenery and Strout, 1966; Beck, Levine and Loayza, 2000; Levine, 2001; Bonfiglioli, 2008) as driving force behind a resilient growth in countries that are ready to take the advantage of the opportunities in front of them.

Similarly, they stress that agricultural trade is a catalyst for growth, especially in developing countries where it is the primary source of foreign earnings, national incomes and employment generations. They further argue that trade in agriculture brings a broad variety of products for consumers to make choices in countries involved (Stiglitz and Charlton, 2007; Krugman, Obstfeld and Melitz, 2010; Mou, 2014; Verter and Bečvářová, 2014). Also, the uneven distribution of land and the climatic conditions in countries, among other factors, have made trade in agricultural commodities inevitable. By implication, trade in food and agriculture could either complement or supplement domestic production and consumption to the countries involved (FAO, 2003; OECD and WTO, 2015).

Undoubtedly, the integration of agriculture into the global trade has come both with benefits and

challenges to countries concerned. For instance, advanced economies have greater market share in the world trade in agriculture than less developed countries. Because they have more access to finance, modern technologies, processing and manufacturing industries, which jointly lead to economies of scale. Also, agriculture still faces stringent constraints to growth and development largely because of trade restrictions and other trade-distorting measures, such as market access, export competition and domestic support. These issues were first brought to the WTO negotiating table in the Uruguay Round and has continued in the current Doha Round (Anderson and Martin, 2005; Stiglitz and Charlton, 2007; McCally and Nash, 2007; Laborde and Martin, 2012; Verter, 2015).

Nigeria is endowed with abundant agricultural commodities. However, the country's major agro-based export products, such as cocoa, sesame seeds, palm kernels and peanuts are yet to be fully tapped for industrial and agribusiness. Prior to the extraction of oil in Nigeria in the 1960s, agriculture was the largest source of exports, but has taken a backseat upon the discovery of crude oil in the country. Consequently, agricultural production and exports have steadily declined, especially during the oil boom in the 1970s. Nigeria has been a net importer of food and agrarian products since 1975. Presently oil accounted for over 90% of total export earnings. Despite the neglect, agriculture is still the main sources of income, household food consumption, employment, in particular, and livelihood, in general, for the rural dwellers.

Historically, until the 2016 budget, oil revenues accounted for more than 80 % of the government budget in Nigeria. Owing to the dwindling crude oil prices in the world market; the demand and prices of oil have drastically dropped recently (the price of crude oil declined from more than $100 per barrel in 2011 to less than $35 per barrel in February 2016). As a consequence, the financial stability of the country has been threatened. Some states in Nigeria currently owe their workers' salaries up to five months. Nigeria is technically in the recession mainly because of oil glut or a mono-product economy. The present shocks in the shortfall of government revenues have become imperative for Nigeria to look beyond oil production and trade, notably, agricultural production and exports.

Kareem *et al.* (2013) confirm that trade has an influence on agricultural performance in Nigeria. However, empirical studies on this issue so far have remained scanty. Also, none of these research works has deeply used all the variables of interest and approaches as being applied in this article to analyse the performance of agriculture in Nigeria. Thus, this contribution bridges the gap. Also, given that agriculture is still the backbone of Nigeria's economy (Verter and Bečvářová, 2016), especially in the present call for the intensification of production, export for revenue diversification, it is inevitable that more research is required to deepen the knowledge of the much-anticipated policies that are aimed at reinvigorating agriculture-related activities for national development.

MATERIALS AND METHODS

This article aimed at assessing the performance of agriculture in Nigeria. This paper is also an attempt to verify the relationship between trade, external financial flows and agricultural performance in Nigeria for the period 1973–2013. To achieve these objectives, annual time series data were obtained from the United Nations Conference on Trade and Development (UNCTAD) annual statistical reports; International Trade Centre (ITC); and Food and Agriculture Organization of the United Nations (FAO). Statistical Software, EViews, is used for the empirical analysis.

The study attempts to analyze the level of trade specialization to determine trade performance of individual products in Nigeria, using Trade Specialization Index (TSI) based on UNCTAD data. TSI is mathematically presented as follows:

$$TSI_{ji} = \frac{X_j^i - M_j^i}{X_j^i + M_j^i} \tag{1}$$

where: TSI_{ji} is the index of trade specialization of economy j for goods i in a given period; i denotes the product or product group; j stands for the economy (nation or nation group); X_{ij} represents economy's j exports of goods i; and M_{ij} denotes economy's j imports of goods i. The range of values is between –1 and +1; the positive value signifies that an economy has net exports (thus, it specializes in the production of the particular product). Conversely, a negative value means that an economy imports more than it exports (net consumption). TSI is also known as normalized trade balance by individual product because it measures the degree of specialization in the production/consumption of goods through trade.

To verify the effect of trade and external financial flows on agricultural performance in Nigeria, a regression model is mathematically specified as follows:

$$AP = \beta_0 + \beta_1 \ln AX + \beta_2 \ln AM + \beta_3 \ln WP + \\ + \beta_4 \ln ADO + \beta_5 FDI + \beta_6 ODAA + \varepsilon \tag{2}$$

where: AP is the net agricultural production index (2004–2006 = 100); the production index measured for agricultural performance. The increase in the index signifies the development of agriculture in an economy. AX is the natural log of the agricultural export index (2004–2006 = 100) in Nigeria. AM is the natural log of agricultural import index (2004–2006 = 100) in Nigeria. Given that smallholder producers characterise agricultural production in Nigeria, their costs of production are always high. An increase in imports may hinder their production as they may not be able to compete

favourably with their foreign competitors in terms of price, quantity and quality. WP is the natural log of world price index (2000 = 100) of raw agricultural products. An increase in the global price index of agricultural commodities, especially in primary commodities, such as cocoa beans, sesame seeds are likely to stimulate exports, which might, in turn, encourage production. ADO is the natural log of agricultural degree of openness [(agricultural export + agricultural import)/nominal GDP]. It is also known as an agricultural trade openness ratio or agricultural trade-to-GDP ratio, measured for the integration of agriculture into the global economy. FDI is the growth rate (%) of inflows of foreign direct investment in Nigeria, proxied by foreign investment in the agricultural sector in the country. ODAA is the growth rate (%) of official development inflows to support agricultural production for food security, and the general wellbeing of producers in Nigeria. In this article, ODAA is also called agricultural ODA. ε is the error term. The variables are selected to verify if they have relationships with agricultural production in Nigeria.

To avoid reporting spurious regression findings, some models, such as Augmented Dickey-Fuller (ADF) coined by Dickey and Fuller (1979), while Phillips-Perron (PP) propounded by Phillips and Perron (1988) for testing for a stationarity of time series data are used. The standard ADF test is carried out by estimating after subtracting from both sides of the equation as follows:

$$\Delta y_t = \alpha y_{(t-1)} + x'_t \delta + \varepsilon_t \quad (3)$$

Similarly, the PP test involves fitting the regression as follows:

$$y_i = \alpha + \rho y_{i-1} + \varepsilon_i \quad (4)$$

The unit root test determines whether the series is stationary at the level, first or second difference. Unlike ADF, the PP test does not require that the ARIMA process is specified and would, hence, be less prone to the model misspecification than the ADF stationarity test. Also, the PP stationarity test corrects for serial correlation in a non-parametric fashion.

Finally, Granger causality, Impulse Response Functions (IRF) and Variance Decomposition Analysis (VDA) tests will be run after stationarity test in this study. Before the Granger causality, IRF and VDA approaches, the unrestricted vector autoregression (VAR) model will be performed. The VAR model is typically used for forecasting systems of interrelated multivariate time series data and for analysing the dynamic impact of random disturbances to the system. The mathematical representation of a VAR is as follows:

$$y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + \beta x_t + \mu_t \quad (5)$$

Where;

y_t is a k of vector of endogenous variables, x_t is a d vector of exogenous variables, while A_1, …. A_p and B are matrices of coefficients to be estimated in the model, and ε_t is a vector of unobservable or white noise. The most common approach for testing if there is a causal relationship between two variables is Granger causality. The model was proposed by Granger (1969) to answer the question of whether x causes y and see how much of the current y could be explained by previous values of y and then to see whether adding lagged values of x could improve the explanation. The mathematical representation of Granger causality is:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + ... + \alpha_l y_{t-l} + \beta_1 x_{t-1} + ... + \beta_1 x_{-l} + \mu_t \quad (6)$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + ... + \alpha_l x_{t-l} + \beta_1 y_{t-1} + ... + \beta_1 y_{-l} + \mu_t \quad (7)$$

for all possible pairs of *(x, y)* time series in the group in the Granger equation. The reported F-statistics are the Wald statistics for joint hypothesis:

$$\beta_1 = \beta_2 = ... = \beta_1 = 0 \quad (8)$$

for the equation. The null hypothesis is that *x* does *not* Granger-cause *y* in the first regression and that *y* does *not* Granger-cause in the second regression.

AGRICULTURAL PERFORMANCE IN NIGERIA

Agricultural production performance: The climatic condition in Nigeria is diverse. It ranges from the tropical areas of the coast to the arid zone of the north. Thus, it makes possible to farm almost all agricultural commodities that could be cultivated in the tropical and subtropical regions of the world. Agricultural production all over the world has experienced dramatic changes in terms of farming methods and output quality, but it has been the case in Nigeria. Available data from FAO (2016) shows that the agricultural production in Nigeria has improved in recent decades, albeit at a slow pace. The share of Nigeria's agricultural production (Constant 2004–2006 = 100, US$) in the world and Africa slowly increased from 1.1 % and 15 % in 1961 to 1.6 % and 17.5% in 2013, respectively. Also, the country's share in crop production increased from 1.6 % and 19.2 % in 1961 to 2.1 % and 21.5 % in 2013 in the world and Africa, respectively. This shows that Nigeria is a major player in agricultural production in Africa.

Similarly, in 2013, Nigeria ranked as the tenth largest producer of agricultural products (Constant 2004–2006, US$) in the world, with $36 billion, after China ($538 billion), India ($251 billion), the USA

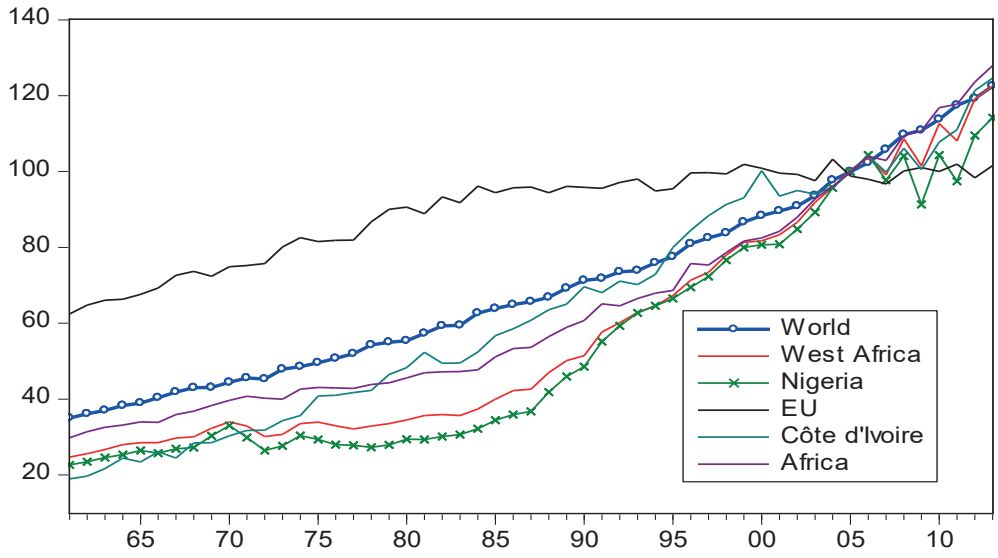
($220 billion), Brazil ($147 billion), Indonesia ($65 billion), Russia ($47 billion), Argentina ($43 billion), Turkey ($39 billion) and France ($38 billion). In the same direction, in Africa, only Nigeria was among the top twenty agricultural producers in the world in the same period under study. Arguably, without empirical evidence, the share of labour force in agriculture has not kept pace with its performance, but modern technologies. Given that the largest producers are also the most populous countries in the world, their active labour force in agriculture (i.e. China, India, Indonesia, Brazil, Argentina, Turkey, Nigeria) and modern technologies (i.e. USA, Japan, France) might have largely accounted for the variations of their production performance. For instance, Fig. 1 shows the net agricultural output index in Nigeria, Ghana, Cote D'Ivoire, West Africa, Africa, European Union (EU) and the World for the period between 1961 and 2013, except for the EU, all the economies' are higher than Nigeria. This suggests that the agricultural performance in terms of production in Nigeria is below the Western Africa, Africa and global averages.

Tab. I presents 13 top agricultural commodities produced in Nigeria and global ranking between 1961 and 2014. The total overall output of the 13 top most crops increased from about 29 million tonnes in 1961 to over 157 million tonnes in 2014. As earlier pinpointed, as shown in Fig. 1, although the increment displays the performance of these products if one calculates a unit of labour per tonne or value added per worker, the result may be below expectation relative to advanced countries. To buttress this argument, data available in from the World Bank (2016) shows agriculture, value added per worker (constant 2010 US$) in Nigeria in 2015 with only $8,579, while Brazil $10,883, Netherlands $78,141 and France $95,420 in the same period under study.

The output of individual agricultural commodities in 2014, shows Nigeria as the largest producer of cassava, yams, cowpeas and shea nuts in the world. The second largest producer of cashew nuts and sweet potatoes. Nigeria also ranked third in sorghum, groundnuts, palm kernels and peanut production(Tab. I); and the fourth largest producer of cocoa beans, ginger, pawpaw and goats in the world in the same period under study. The country also accounts for a significant proportion of the global output of millet, rubber Nat dry, fresh tomatoes, plantains and sesame seeds. It implies that Nigeria has a comparative and competitive advantage in the production of these commodities. Even though the climatic condition in Nigeria is diverse and conducive, that makes it possible to farm/cultivate almost all agricultural products, Nigeria is a net importer of food (Tab. II and IV) and among the worst countries with food security issues in the world (Economist Intelligence Unit, 2015).

Agrarian trade performance: Globally, the share of agriculture in the total global trade was above 50 % in the 20th century, but steadily decreased to 9.5 % in 2014 as fuels, mining and manufacturing products have taken over (WTO, 2O15). Nonetheless, global trade in agriculture has increased in recent decades. Similarly, the developing countries' share of agrarian exports to other developing countries has also increased. However, their share of agrarian exports to developed countries has stagnated. Arguably, developed economies' trade restrictions have stifled trade and growth in developing countries (FAO, 2003; Mccally and Nash, 2007; WTO, 2015), such as Nigeria (Abolagba *et al.*, 2010; Verter, 2015).

Even though agricultural export value in Nigeria has increased, its share in total merchandise exports fell from 62 % in 1963 to about 42 % in 1969, shrank to 5 % in 1974, and then declined to less than 0.03 % between 2001 and 2003. However, the country has



1: *Net agricultural production index (2004-2006 = 100) in Nigeria and some selected economies, 1961-2013*
Source: Author's analysis based on FAO, 2016

started recording an upward growth, as it reported 5.1 % in the share of total exports in 2013, but declined to 1.9 % in 2014 (Verter and Bečvářová, 2016). Despite the decline of agriculture in the share of total merchandise exports in Nigeria, it still accounts the largest share of non-oil exports. Agriculture contributed 47 % in total non-oil export, ahead of manufactured (15.2 %), semi-manufactured (30.8 %), minerals (3.8 %) and others 3.2 % (CBN, 2013). This implies that the importance of agriculture as a major source of foreign earnings after oil in the country cannot be overemphasized.

Nigeria's leading agricultural export commodities by quantity are cocoa, sesame seed, wheat, cashew nuts (with shell), natural rubber, cotton and palm oil (Tab. II). The structure of agricultural export is concentrated in these few commodities and markets, as the top 10 export commodities have accounted for over 80 % of the total value of agricultural exports from the country. This implies that Nigeria is vulnerable to the global demand and price volatility. Surprisingly, commodities such as *groundnut, cotton, palm oil* and *soybeans*, which were among the leading agrarian exports, have taken a back seat. For instance, Nigeria lost her glory as the country moved from being among the largest exporters of these products to be among the net importers of some of these products (Tab. III and Tab. IV).

Sadly, even though agriculture is the mainstay of the economy of Nigeria (Verter and Bečvářová, 2016), the country has been performing badly in the world markets. For instance, the merchandise trade

I: *Nigeria: Top 13 agricultural commodities produced (tonnes, 1,000) and global ranking, 1961–2014*

Indicator/year		2014		2000		1980		1961	
Rank	**Commodity**	**Q ('000)**	**GR**	**Q ('000)**	**GR**	**Q ('000)**	**GR**	**Q ('000)**	**GR**
1	Cassava	54,832	1	32,010	1	11,500	4	7,384	4
2	Yams	45,004	1	26,201	1	5,248	1	3,500	1
3	Maize	10,791	11	4,107	17	612	35	1,107	17
4	Oil, palm fruits	7,968	4	8,220	3	5,750	2	6,750	1
5	Sorghum	6,741	3	7,711	2	3,690	4	3,958	4
6	Rice, paddy	6,734	14	3,298	17	1,090	23	133	n.a
7	Vegetables, fresh nes	6,180*	4	3,945	4	972	14	826	13
8	Fruit, citrus nes	3,800	2	3,250	1	1,800	1	1,000	1
9	Sweet potatoes	3,478	2	2,468	2	100	0	149	n.a
10	Groundnuts	3,413	3	2,901	3	471	6	1,565	2
11	Taro (cocoyam)	3,273	1	3,886	1	208	5	1,147	1
12	Plantains	2,780*	6	1,969	4	1,042	6	798	5
13	Cow peas, dry	2,138	1	2,150	1	510	1	431	1
Total (top 13 products)		157,132	-	102,116	-	32,993	-	28,748	-
Roots and Tubers		107,835	2	65,164	2	17,096	5	12,198	7

Source: Author's analysis based on FAO, 2016. Note: * indicates data in 2013; Rank stands for domestic ranking; GR denotes global ranking of individual product; Q stands for quantity output in tonnes; n.a denotes not available

II: *Nigeria: Top 10 export products in quantity (tonnes, 1,000), 1965–2013*

Rank	Commodity	2013		2010		2000		1980		1965	
		Q ('000)	**GR**	**Q ('000)**	**GR**	**Q ('000)**	**GR**	**Q ('000)**	**GR**	**Q ('000)**	**GR**
1	Cocoa beans	182.9	4	226.6	4	139.0	4	133.9	3	305.6	2
2	Sesame seed	153.4	3	120.0	3	30.2	5	n.a	n.a	20.5	3
3	Bran of Wheat	93.7	13	127.6	10	88.1	9	160.0	7	n.a	n.a
4	Cake of Palm Kernel	77.0	4	65.5	4	160.4	4	70.0	2	4.0	9
5	Cashew nuts, with shell	75.2	6	6.6	9	3.0	10	1.0	6	1.0	4
6	Rubber Nat Dry	51.3	12	42.4	12	36.0	7	14.6	8	70.0	4
7	Cotton lint	37.5	21	18.4	22	0.2	n.a	n.a	n.a	24.9	24
8	Palm oil	18.0	33	13.0	32	8.0	30	n.a	n.a	152.4	1
9	Ginger	14.3	8	5.6	9	4.3	7	n.a	n.a	n.a	n.a
10	Groundnut oil	3.7	9	3.9	11	0.16	17	n.a	n.a	92.2	2

Source: Author's analysis based on FAO, 2016. Notes: Rank denotes national ranking; GR stands for global ranking, Q denotes quantity (tonnes)

specialisation index (TSI) according to individual products in Nigeria (Tab. III) for the period 1995–2012 shows the sluggish performance of the country in the global market. The positive values signify that Nigeria is a net exporter of these products. Thus, the need for specialization in the production and exportation of those commodities as postulated by the theory of comparative advantage. Conversely, negative values suggest that Nigeria imports more than its exports (net consumption). Therefore, the country should either step up productions or continue to import if it cannot cheaply produce in large quantities at home. As shown in Tab. III, Nigeria, is a net exporter of tropical commodities, such as cocoa, coffee, natural rubber, tobacco. This implies that the country has a comparative advantage in the broad range of tropical products, albeit only in raw products.

Agricultural trade can accelerate growth and development in African countries, such as Nigeria if trade restrictions and distortions both in primary commodities and tariff escalation in processed and semi-processed agricultural products are drastically reduced in importing nations. As postulated by the dependency theory, Africa as a whole, and Nigeria in particular, being peripherals are still largely exporting mainly raw agricultural commodities, such as cocoa beans, sesame seeds, cigarettes and rubber. On the other hand, they are largely importing processed food, such as chocolate, refined sugar, palm oil, wheat and paste of tomatoes, and farm inputs, such as fertilizer and modern technologies (Tab. IV and V) at exorbitant prices. Sadly, the import growth rate of food and agriculture is more than exports in many products (Tab. V). As shown in Tab. IV, Nigeria spent a substantial amount

III: *Nigeria: Merchandise trade specialization index in some selected products, 1995–2012*

Indicator/year	1995	2000	2003	2005	2008	2009	2010	2012
Total all products (agriculture, fuels, mining)	0.20	0.41	0.38	0.38	0.24	0.25	0.32	0.43
All food items (SITC 0 + 1 + 22 + 4)	–0.44	–0.78	–0.51	–0.71	–0.63	–0.50	–0.47	–0.67
Food, basic (SITC 0 + 22 + 4)	–0.42	–0.78	–0.49	–0.70	–0.63	–0.51	–0.49	–0.69
Beverages and tobacco (SITC 1)	–0.80	–0.96	–0.96	–0.96	–0.67	–0.21	–0.20	–0.13
Agricultural raw materials (SITC 2 less 22, 27 and 28)	0.60	0.38	0.06	–0.02	–0.15	0.28	0.08	0.12
Fuels (SITC 3)	0.93	0.96	0.96	0.96	0.83	0.87	0.88	0.89
Food and live animals	–0.43	–0.79	–0.48	–0.72	–0.67	–0.56	–0.56	–0.72
Wheat (including spelt) and meslin, unmilled	–1.00	–1.00	–1.00	–1.00	–1.00	–1.00	–1.00	–1.00
Rice	–0.98	–1.00	–0.99	–0.91	–1.00	–1.00	–1.00	–1.00
Maize (not including sweet corn), unmilled	0.97	0.89	–0.68	–0.30	–0.90	–0.81	–0.54	–0.45
Cereals, unmilled (excluding wheat, rice, barley, maize)	0.90	–0.93	–0.65	0.19	–0.93	0.82	0.99	0.92
Meal and flour of wheat and flour of meslin	–0.34	–0.14	–0.39	0.29	0.49	0.75	–0.79	–0.44
Cereal preparations, flour of fruits or vegetables	–0.75	–0.98	–0.97	–0.93	–0.98	–0.95	–0.93	–0.80
Vegetables and fruits	–0.02	–0.62	–0.40	–0.30	–0.44	–0.41	–0.40	–0.41
Vegetables	–0.42	–0.92	0.40	0.33	0.04	0.19	0.00	0.20
Fruits and nuts (excluding oil nuts), fresh or dried	0.81	0.58	0.11	0.12	0.88	0.88	0.79	0.50
Fruit and vegetable juices, unfermented, no spirit	–0.99	–0.99	–0.99	–0.99	–0.93	–0.76	–0.77	–0.81
Sugar, sugar preparations and honey	–0.90	–0.98	–0.93	–0.93	–0.90	–0.86	–0.82	–0.82
Sugar confectionery	0.24	–0.71	–0.28	–0.57	–0.15	0.25	0.00	0.31
Coffee, tea, cocoa, spices, and manufactures thereof	0.78	0.05	0.51	–0.14	0.86	0.85	0.76	0.22
Coffee and coffee substitutes	–0.70	–0.99	–0.99	–0.99	–0.95	–0.98	–0.92	–0.87
Cocoa	1.00	1.00	0.98	0.96	1.00	0.99	0.99	0.30
Chocolate, food preparations with cocoa	–0.24	–0.83	–0.25	–0.66	–0.88	–0.53	–0.29	–0.37
Hides and skins (except furskins), raw	0.71	0.46	–0.35	–0.73	–0.91	–0.79	–0.52	–0.26
Oil seeds and oleaginous fruits	0.93	0.60	0.30	0.73	0.93	0.97	0.51	–0.16
Natural rubber & similar gums, in primary forms	0.99	0.95	0.86	0.84	0.95	0.98	0.99	0.31
Cotton	0.42	–0.54	–0.05	0.36	0.99	1.00	0.98	0.96
Crude fertilizers other than division 56	–0.83	–0.90	–0.92	–0.94	–0.91	–0.94	0.55	0.14
Animals oils and fats	–1.00	–1.00	–1.00	–1.00	–1.00	–1.00	–1.00	–0.91
Processed animal and vegetable oils/fats	–0.99	–0.99	–0.98	–0.93	–0.97	–0.98	–0.99	–0.97
Fertilizers other than group 272	0.01	–0.99	–0.97	–0.87	–0.96	–0.75	–0.94	–0.54
Agricultural machinery (excluding tractors) & parts	–0.94	–0.99	–0.98	–0.99	–0.98	–0.99	–0.99	–0.96

Source: Author's analysis based on UNCTAD, 2015

IV: *Trade Performance HS in Nigeria (US$, millions, %), 2014*

Indicators, 2014 (US$ millions, and %)	Export value	Import value	Net trade value	Export (% of exports)	Import (% of imports)	Exports (% of world exports)	Imports (% of world imports)	Export Growth (%)	Import growth (%)	Net Trade*
18 Cocoa and cocoa preparations	829	22	807	0.89	0.04	1.68	0.05	-1	48	94.8
44 Wood and articles of wood, etc.	401	197	204	0.43	0.38	0.29	0.14	67	26	34.1
12 Oil seed, grain, seed, fruit, etc.	352	45	307	0.38	0.09	0.35	0.04	18	57	77.3
41 Raw hides and skins and leather	287	6	281	0.31	0.01	0.79	0.02	0	4	96.2
40 Rubber and articles thereof	88	684	-597	0.09	1.33	0.05	0.34	-13	7	-77.3
03 Fish, crustaceans, molluscs,etc	77	856	-779	0.08	1.66	0.07	0.78	4	14	-83.5
24 Tobacco and manufactured subs.	72	91	-20	0.08	0.18	0.17	0.21	13	4	-12.1
09 Coffee, tea, mate and spices	33	35	-2	0.03	0.07	0.07	0.08	22	9	-3.8
08 Edible fruit, nuts, etc	31	67	-36	0.03	0.13	0.03	0.06	28	109	-37.1
31 Fertilizers	20	222	-202	0.02	0.43	0.03	0.31	53	1	-83.3
52 Cotton	19	294	-275	0.02	0.57	0.03	0.5	-11	23	-88
21 Miscellaneous edible preparations	9	316	-307	0.01	0.61	0.01	0.48	58	12	-94.7
55 Manmade staple fibres	6	226	-220	0.01	0.44	0.01	0.56	-12	17	-95.1
19 Cereal, flour, starch, milk prep.	3	473	-470	0	0.92	0	0.73	18	21	-98.6
04 Dairy products, eggs, honey, etc.	3	662	-659	0	1.28	0	0.68	57	9	-99
07 Edible veget. & some roots/tubers	3	12	-9	0	0.02	0	0.02	9	14	-60
10 Cereals	2	2,079	-2,077	0	4.03	0	1.65	-35	5	-99.8
05 Products of animal origin, nes	2	1,36	630	0	0	0.02	0.01	3	30	18.8
20 Vegetable, fruit, etc food prep.	2	264	-262	0	0.51	0	0.45	68	14	-98.6
17 Sugars and sugar confectionery	1	699	-698	0	1.35	0	1.48	15	8	-99.6

Source: Author's analysis based on ITC, 2016. Note: *Net Trade = (X – M)/(X + M) * 100

of money on cereal (i.e. wheat, rice, maize), fish and sugar importation, which the country can produce to outweigh domestic demand if given adequate attention to boost value addition and export.

The International Trade Centre (ITC) develops the Trade Performance Index (TPI) aimed at evaluating and monitoring the multi-faceted dimensions of the export performance of individual sectors and economies. The index calculates and monitors the level of diversification and competitiveness of a particular export sector and compare the findings with other nations. The index not only reveals gains and losses in global market shares but also sheds light on the factors that are driving these changes. Even though the TPI is mainly a quantitative approach, it does showcase a systematic position of sectoral export performance as well as comparative and competitive advantages of countries. Tab. V presents TPI in fresh (raw) and processed agro-products in Nigeria.

As shown in Tab. V, indicators from G1 to G6 represent the general profile of Nigeria's trade in primary and processed food. Even though the country experienced robust growth of agricultural export in 2010, the overall relative trade balance (RTB)[1] was negative. Also, its national share of processed food export was zero. The country witnessed negative trade growth (-21%) for both fresh and processed food export in 2014. Similarly, the relative trade balance in 2014 was also negative for both fresh (–35 %) and processed (–93 %) food. It signifies that Nigeria was largely a net importer of both fresh and processed food as consumption outweighs production.

Tab. V also shows indicators from P1 to P5b, which represent the current Nigeria's trade performance in the global market. The value of per capita exports in Nigeria between 2010 and 2014 shows that the level the country's population produced for the world market was below expectation. Similarly, the overall share of Nigeria's fresh and processed food in the global market share show that the country was not a global player in the world's agricultural market during the period under review. The country's share decreased from 0.6 % and 0.06 % in 2010 to 0.018 % and 0.02 % in 2014 in the global proportion of fresh and processed food exports.

The equivalent number denotes the degree of the market diversification horizon of a given country. Tab. V reveals that the number of Nigeria's major importing partners reduced from 15 (fresh food) and 10 (processed food) in 2010 to 7 (fresh food) and 6 (processed food) in 2014. This implies that the vulnerability of Nigeria to shocks within destination partners has been intensified.

Also, indicators from C1 to C1d represent the decomposition of changes in Nigeria's market share in the world for the previous five years (Tab. V). The change in competitiveness effect signifies a quota of the relative change in global market share of a given country. As shown in Tab. V, the positive change in competitiveness effect indicates that Nigeria performed for the period between 2006 and 2010. However, the percentage change in the competitiveness of Nigeria's exports in the world market drastically reduced as the country recorded an inverse direction in both fresh and processed food between 2010 and 2014. Nonetheless, the results of the adaptation indicator show that Nigeria was able to adjust export supply to changes in the global demand for its agrarian products for the period between 2006 and 2014. The positive effect shows that Nigeria's market share increased in the markets of her importing partners. Notwithstanding, with the increasing integration of markets as a result of globalization, Nigeria faces a more fiercely competitive external agrarian trading environment.

As shown in Tab. III–V, the poor agricultural export performance in Nigeria could be partly attributed to some of the **foreign trade constraints**, such as the market access, volatility of global commodity prices, domestic support, quality standards, currency volatility and competitiveness. Thus, some of these issues are briefly highlighted below.

Market access: Tariff and non-tariff measures (NTMs) are the main constraints to trade in agricultural commodities in countries. Underdeveloped countries increase tariffs to raise revenues and partly to protect infant industries, whereas the advanced economies increase tariff mainly to curtail trade so as to protect domestic industries that are vulnerable to global competition. *Tariff escalation* means higher tariffs on processed commodities than on raw materials (Tab. VI). This type of trade restriction in developed economies in semi–processed and processed agricultural products from Nigeria and other underdeveloped countries is extremely outrageous making their exporters almost impossible to access the markets of those economies, notably, the USA and the EU. As shown in Tab. VI, tariff escalations are more pronounced in processed products such as cocoa, tea, hides and skins, sugar, meat, coffee and fruit, which are among the main export commodities in Nigeria. Arguably, developed countries' hidden agenda might be to ensure that countries, such as Nigeria remain suppliers of raw commodities to their well-established industries, and in return, import processed products as postulated by the dependency theory. Even though countries have reduced tariffs, largely attributed to the WTO's persistent efforts in reducing trade barriers for

1 Formula of relative trade balance: $[\![RTB]\!]\_ds\hat{}t = 100 \times (X\_ds\hat{}t - M\_ds\hat{}t)/(X\_di\hat{}t + M\_ds\hat{}t)$; where: t is the current year, d is the country under study, s is the selected sector, X are the exports, and M is the imports.

mutual benefits, it persists in processed agricultural products (Tab. VI).

Sanitary and Phytosanitary (SPS) Measures: SPS measures are forms of technical trade barriers, also referred as NTMs. The quality of food and agricultural products, as well as technical regulations, appear as among the key constraints faced by Nigerian exporters when exporting to OECD markets, notably, the EU, Japan and the US. Implementing SPS measures, more than trade costs,

V: *Trade Performance Index (TPI) in fresh and processed food in Nigeria, 2010–2014*

Indicators/year		2010				2014			
		Fresh food	Fresh rank	Processed food	Processed rank	Fresh food	Fresh rank	Processed food	Processed rank
N	No. of exporting countries	180	-	166	-	177	-	165	-
G1	Value of exports (US$ millions)	3,699	n.a	360	n.a	1,438	n.a	134	n.a
G2	Export growth in value, p.a. (%)	98%	1	222%	1	-21%	172	-21%	158
G3	Share in national exports (%)	4%	n.a	0%	n.a	1%	n.a	0%	n.a
G4	Share in national imports (%)	5%	n.a	5%		5%	n.a	8%	n.a
G5	Relative trade balance (%)	17%	n.a	-73%	n.a	-35%	n.a	-93%	n.a
G6	Relative unit value (world average = 1)	2.2	n.a	1.1	n.a	0.9	n.a	0.7	n.a
P1	Net exports (US$ millions)	1,110	31	-1,948	148	-1,586	152	-4,001	156
P2	Per capita export US$/inhabitant)	23.2	133	2.3	147	8.3	156	0.8	155
P3	Share in world market (%)	0.60%	35	0.06%	86	0.02%	69	0.02%	112
P4a	Product diversify. (N° of equiv. products)	6	83	4	122	4	128	3	137
P4b	Product concentration (Spread)	n.a	87	n.a	122	n.a	123	n.a	131
P5a	Market diversification (N° of equiv mkts)	15	17	10	50	7	88	6	97
P5b	Market concentration (Spread)	n.a	18	n.a	54	n.a	89	n.a	98
C1	Relative Δ of world market share p.a (%)	190%	n.a	1,478	n.a	-14.1%	n.a	-14.3%	n.a
C1a	Competitiveness effect, p.a. (%)	78.1%	3	887%	1	-13.4%	171	-14.7%	156
C1b	Initial geographic specialization, p.a. (%)	-0.1%	95	-0.7%	103	-4.0%	175	-5.9%	163
C1c	Initial product specialization, p.a. (%)	-11.8%	175	2.1%	46	-4.9%	152	-4.8%	154
C1d	Adaptation effect, p.a. (%)	124%	1	590%	1	8.2%	9	11.1%	5
C2	Matching with dynamics of world demand	n.a	105	n.a	97	n.a	130	n.a	128
A	Absolute Δ of world market share (%)	0.11%	4	0.01%	26	-0.09%	172	-0.01%	140
P	Average Index: Current Index	n.a	39	n.a	125	n.a	139	n.a	155
C	Average Index: Change Index	n.a	81	n.a	49	n.a	164	n.a	158

Source: ITC, 2016. Notes: C1a – C1d = Change 2006–2010 for Change Index for 2010; C1a – C1d = Change 2010–2014 for Change Index for 20014, GR denotes global ranking

VI: *Nigeria: Tax escalation in the main products in main importing partners*

	Indicators	Average applied MFN tariffs					
		US 2010	EU 2010	Japan 2007	US 2014	EU 2015	Japan 2014
Cocoa	Beans	0	0	0	0	0	0
	Powder	10	8	29.8	0.1	8	29.8
	Chocolate	10	43	21.3	5.6	40.5	29.8
Sesame	Raw Seed	0	0	0	0	0	0
	Sesame oil & fraction	0.3	7.4	3.1	0.2	7.4	1.9
Coffee	Husks & skins	0	0	0	0	0	0
	Roasted	0	7.5	12.0	0	7.5	12
	Subs. containing coffee	0.3	11.5	12.0	0.3	11.5	12
Cotton	Lint	0	0	0	0	0	0
	Yarn	5.9	4.0	5.6	5.9	4	5.6
Oranges	Fresh	1.8	12.0	24.0	1.5	16.7	24
	Juice	22.5	33.4	25.5	13.2	31.7	25.5

Source: Author's analysis based on ITC market access map, 2016

present a tedious challenge to Nigerian producers and exporters. For instance, owing to Nigeria's inability to adhere to global food and feed safety and standards, in June 2015, the EU banned some main food export from Nigeria to its markets for a year period. The products banned were beans, dried fish and meat, sesame seeds, melon seeds, palm oil and peanut chips. This is partly because producers and traders in Nigeria have poor awareness and understanding of the applicable global standards and their relevance. For instance, the specific reasons for the banned include a high level of chemicals, insufficient information on nutritional content, poor labelling and high levels of pesticide. Undoubtedly, this was a big blow as the country desperately needs to boost its export baskets and foreign earnings in the present period of oil glut and economic downturn.

In other words, quality standards and strict border enforcement may have implications on agricultural exports in Nigeria, especially in semi-processed and processed products. This could be compounded as the country seems to lack expertise and equipment at the standard-setting and the enforcement stage, that catapults to uncoordinated and overlapping technical regulations and other activities, which lead to delays and duplicating costs. Arguably, farmers, processors and exporters may have been marginalized and excluded from trade benefits, as these technical trade barriers partly nullify their competitive and comparative advantage in the global markets, thus, to some extent, impede production, trade and growth in Nigeria.

Domestic support and export subsidies: Because agricultural producers and exporters in the advanced economies are heavily protected and backed up by their States, they enjoy modern technology and increasing economies of scale, and value chains that are the case in Nigeria. Huge domestic support and export subsidies provided by the developed economies, notably, the EU, USA and Japan have created unnecessary restrictions and unhealthy competitions. This behaviour might hamper domestic producers and exporters in Nigeria as they cannot favourably compete with producers and exporters from advanced countries regarding price, quality and quantity. Arguably, the persistent increases in the import of agrarian products in Nigeria might be at the expense of domestic producers and exporters.

Commodity price fluctuations in the world markets: Price volatility characterizes most agricultural commodity markets. The consistent price volatility of primary agrarian products in the global markets might have had adverse effects on exports and earnings in Nigeria. Because world prices of agrarian commodities are notoriously volatile, its create bottlenecks for producers and exporters needing to take proactive investment decisions and for resource-constrained consumers. Also, Nigeria continues to export a broad range of primary products that are highly vulnerable to shocks in demand in the global commodity markets, which lead to disincentives to production and trade when the prices sharply shrink. The inability of Nigeria to favourably compete in the world markets is partially reflected in the persistent increase in the negative trade balance in food and agricultural products.

Trade costs have also become a focal point of discussion in the WTO and academic circles in recent years. This is partly due to the increased visibility in reducing traditional trade restrictions (Moïsé and Le Bris, 2013; Moïsé *et al.*, 2013). Arguably, '*high trade costs effectively nullify comparative advantage by rendering exports uncompetitive. High trade costs deny firms access to technology and intermediate inputs, preventing their entry into, or movement up, global value chains. High trade costs also erode consumer welfare narrowing the range of good and services on offer and pushing up prices. While trade costs do not alone explain the development pathways of economies, they are a major factor explaining why some countries are unable to grow and diversify*' (OECD and WTO, 2015, p. 35). Similarly, Atkin and Donaldson (2015) estimate shows that the intra-national trade costs are approximately four to five times higher in some SSA countries, notably, Nigeria and Ethiopia, than in developed countries, such as the USA. Available data from OECD and WTO (2015) shows that average time takes exporters 23 days to export goods, while import takes an average of 34 days in Nigeria. This delay partly contributes to high costs of trade, which small scale traders cannot afford to trade across national borders. Trade costs as well as procedural or bureaucratic bottlenecks at home and the border, coupled with high transportation costs, appear among the factors that are constraining agricultural trade and development in Nigeria.

EMPIRICAL RESULTS AND DISCUSSION

The findings of the unit root test are presented in Tab. VII. The results show that only FDI growth rate and agricultural ODA are stationary at levels. The rest of the variables have become stationary after first difference. Consequently, Granger causality, IRF and VDA techniques were run in a VAR environment after the test for stationarity were carried out. Based on the information lag selection criteria, the optimal lag length of four was chosen.

The results from the Granger causality technique is presented in Tab. VIII. The result suggests there is a unidirectional causality running from agricultural imports, the world price of primary agrarian products, agricultural trade openness and agricultural ODA to agricultural production in Nigeria. The result further suggests that all the variables in the model jointly Granger-cause agricultural production in the country.

Also, a unidirectional causality running from FDI to agricultural production in Nigeria is confirmed (Tab. VIII). By implication, FDI if sufficiently channelled to the agrarian sector it could serve as an important driver for agribusiness development in the country. Until recently, the inflows of FDI in Nigeria largely concentrated in the oil industry. However, the investment of multinational corporations into agriculture, especially firms that use agrarian products as inputs has increased in recent years. The result tallies with the works by Kareem *et al.* (2013); Effiong (2016) who also find out that FDI Granger-cause food production in Nigeria.

The results show that agricultural ODA Granger-cause agricultural performance in Nigeria. In a country where farmers lack funds to finance their farming related activities, if foreign aid is adequately channelled to agricultural related activities, it may well complement their limited resources for high productivity. The result further suggests that all the variables in the model jointly Granger- cause agricultural production in the country. As shown in Tab. VIII, agricultural production and openness Granger- cause exports in Nigeria. This implies that agricultural output and openness are determinants of agrarian exports in Nigeria. The result agrees with the works by Folawewo and Olakojo (2010) who also find that agricultural production determines export in Nigeria. The results further reveal that all the variables in the model jointly Granger-cause agricultural exports. Also, a unidirectional causality is confirmed to be running from export, world price and agricultural ODA to imports in Nigeria. A bidirectional causality is emanating from trade openness to imports in the country. The result further indicates that all the variables in the model jointly Granger- cause imports in Nigeria. Finally, a unidirectional causality is confirmed to be running from trade openness, agricultural ODA and FDI to world price of primary agricultural products (Tab. VIII).

Because Granger-causality technique might not reveal the complete situation about the link and direction between the variables of interest, an IRF is likely to bridge the gap. The IRF approach signifies the response of one variable to an impulse or a shock in another variable in a system. The result of the IRF is shown in Fig. 2. The initial response of agricultural exports to production is positive, and then diminishes below the equilibrium in the third year, swiftly increases to reach the plausible direction in the fourth year. The response fluctuates above and below the equilibrium line over the years as it records adverse shocks in the fifth, seventh and tenth periods. This might be partly because of the external constraints to export and the neglect of agriculture after the advent of oil *('Dutch disease')* which have made export to fluctuate negatively in the period under study.

A cursory examination of response of imports to production records negatives in all the years, except in the eighth and the tenth year. The drastic increased in agricultural imports in Nigeria suggest having negative implications on agricultural performance (Tab. III–V) in the country. This might have compounded the situation, especially in Nigeria, where agricultural related activities are largely carried out by smallholder and family farmers who could not compete favourably with foreign competitors regarding quality, quantity and price.

Also, a further examination shows the initial response of trade openness to agricultural production is positive only in the fourth, sixth and ninth year, all other years are negative but move up and down as time passes on. Likewise, the response from world price, FDI growth and agricultural ODA to agricultural performance also show negative and positive shocks as years pass on.

Statistically speaking, VDA separates the variation in an endogenous variable in the component response in the model while IRF traces the shocks of a change to another endogenous variable on to

VII: *ADF and PP unit root tests*

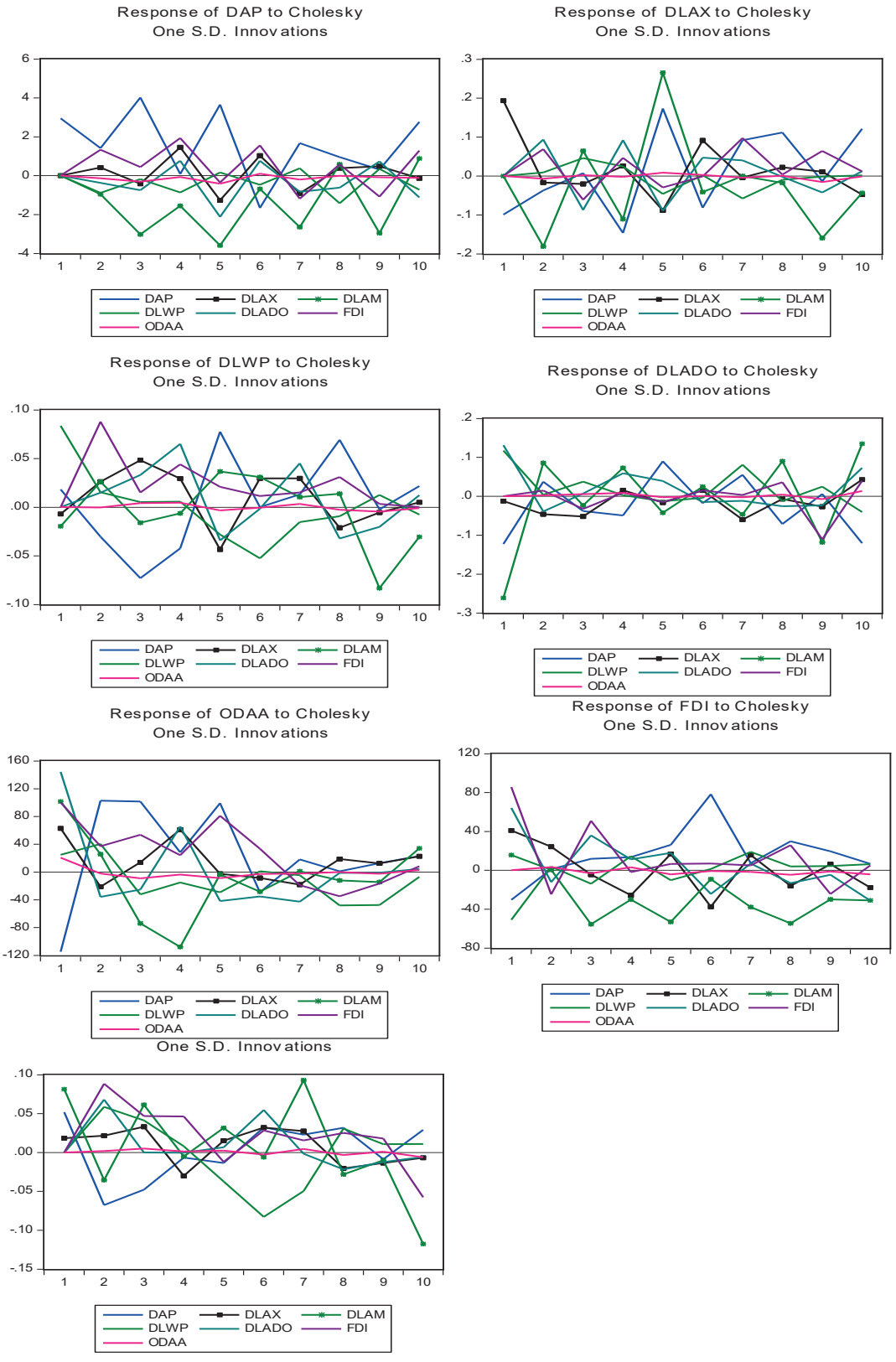
Variable	Levels	ADF Test Statistics	PP Test Statistics
AP	Level	- 0.9286	0.9712
	First difference	-3.8497	-9.4333
AX	Level	-0.4910	-1.0758
	First difference	-7.8869	-7.8868
AM	Level	-1.7928	-1.7927
	First difference	-5.8921	-5.9786
ADO	Level	-0.1746	-0.0572
	First difference	-6.1978	-6.2134
WP	Level	-1.0034	-1.0858
	First difference	-6.4472	-6.4142
FDI	Level	-6.9320	-6.9216
ODAA	Level	-5.5093	-5.4850

Note: McKinnon (1991) critical values are: –2.607 for 10 %, –2.937 for 5 % and –3.606 for 1 % levels, respectively

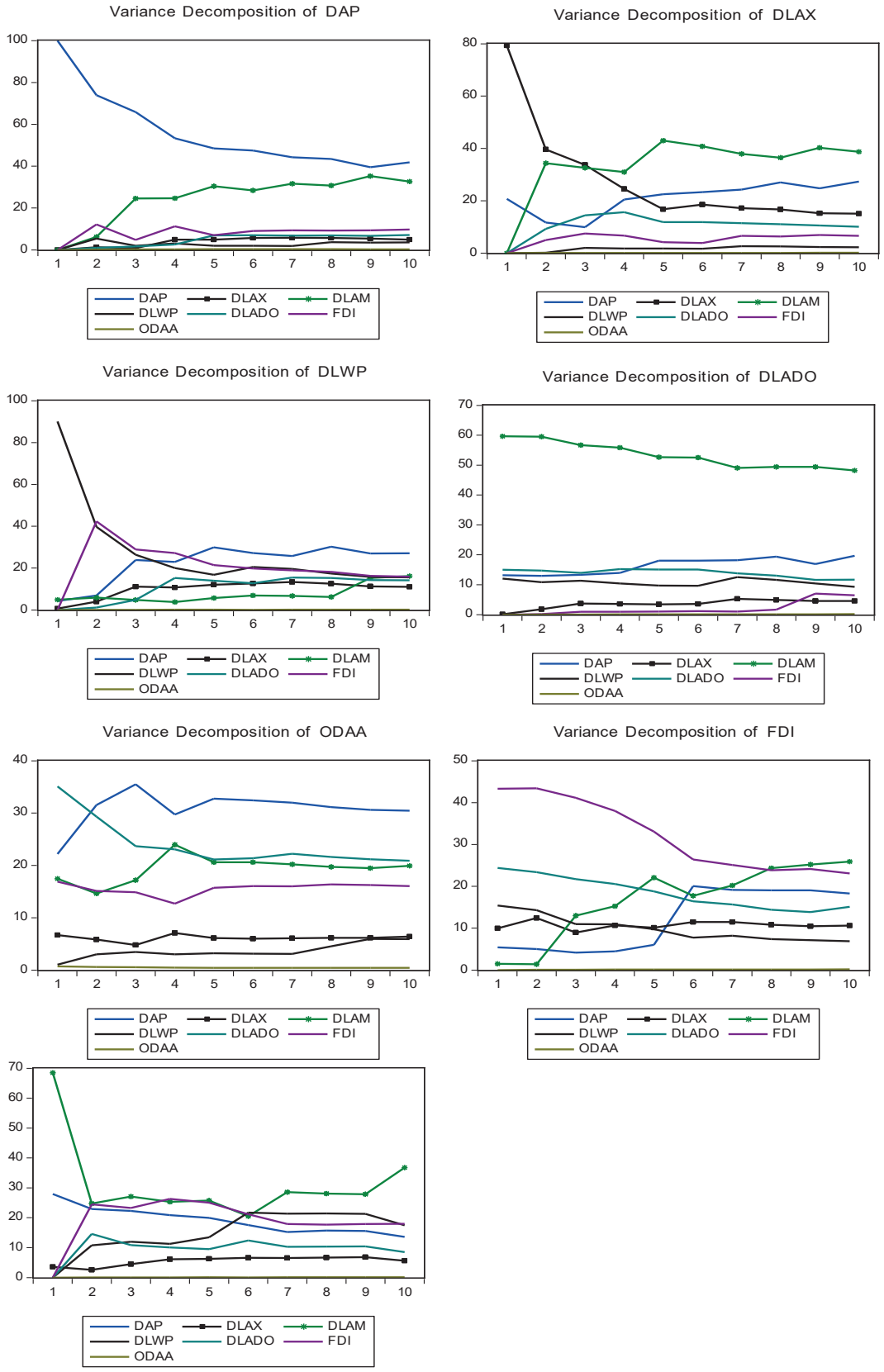
VIII: *VAR Granger Causality/block exogeneity Wald test*

Equation	Excluded	χ^2- *statistic*	Df	Prob.
AP	lnAX	6.3987	4	0.1713
	lnAM	9.0653	4	0.0595
	lnWP	12.156	4	0.0162
	lnADO	10.8829	4	0.0279
	FDI	12.0908	4	0.0167
	ODAA	19.0140	4	0.0008
	All	39.9496	24	0.0217
lnAX	AP	8.1020	4	0.0879
	lnAM	0.8377	4	0.9333
	lnWP	3.7840	4	0.4360
	lnADO	11.5674	4	0.0209
	FDI	3.2006	4	0.5248
	ODAA	2.2779	4	0.6848
	All	34.3812	24	0.0781
lnAM	AP	6.3490	4	0.1746
	lnAX	8.5123	4	0.0745
	lnWP	12.8177	4	0.0122
	lnADO	9.4615	4	0.0505
	FDI	8.6545	4	0.0703
	ODAA	8.3452	4	0.0797
	All	59.4239	24	0.0001
lnWP	AP	5.7293	4	0.2203
	lnAX	5.4765	4	0.2418
	lnAM	5.4698	4	0.2424
	lnADO	8.9885	4	0.0614
	FDI	15.2282	4	0.0043
	ODAA	7.8382	4	0.0977
	All	60.3653	24	0.0001
lnADO	AP	2.3949	4	0.6636
	lnAX	0.8799	4	0.9274
	lnAM	2.3318	4	0.6750
	lnWP	2.1582	4	0.7067
	FDI	0.4750	4	0.9759
	ODAA	0.8092	4	0.9372
	All	9.3602	24	0.9967
FDI	AP	1.4194	4	0.8408
	lnAX	3.3883	4	0.4951
	lnAM	1.2548	4	0.8690
	lnWP	1.8036	4	0.7718
	lnADO	2.1994	4	0.6991
	ODAA	3.8146	4	0.4317
	All	14.4132	24	0.9368
ODAA	AP	2.9441	4	0.5672
	lnAX	0.5808	4	0.9652
	lnAM	3.3721	4	0.4976
	lnWP	2.2942	4	0.6818
	lnADO	3.4301	4	0.4886
	FDI	1.1486	4	0.8865
	All	10.0001	24	0.9945

Note: Original sample size: 1973–2013. Included obs: 36 after adjustments



2: *Response to Cholesky one SD (± 2 S.E. innovations)*



3: *Estimates of variance decomposition analysis*

other variables in the VAR environment. Therefore, the VDA gives information about the relative significance of each random innovation in the VAR system.

The VDA results for the selected variables over a 10-year horizon is presented in Fig. 3. The results reveal that in the fourth period, the impulse to agricultural production accounts 53.3 % variation in the fluctuations to its own shock. Similarly, innovation to exports (5 %), imports (25 %), world price (3 %), the degree of openness (3 %) and FDI growth (11 %) can cause fluctuation in agricultural output in the fourth period. In the 10 period, the results further suggest that innovation to agricultural production steadily reduces to 42 % in the long run, while shock to exports (5 %), imports (33 %), world price (4 %), trade openness (7 %), and FDI growth (10 %) and agricultural ODA (0.3 %) account for the fluctuations in production in the long- run (Fig. 3). As it has been already revealed in the IRF test (Fig. 2), agricultural imports might have hurt production in the country.

The results also reveal that in the fourth period, the impulse to agricultural export accounts 25 % variation in the fluctuations to its own shock. Similarly, the impulse to production (5 %), imports (31 %), world price (2 %), trade openness (16 %) and FDI growth (6 %) cause the fluctuation in agricultural exports in the fourth period. In the 10th year, the results further signify that innovation to agricultural export drastically decreases to 15.1 % in its own shock. Also, a shock to production (27 %), imports (38 %), world price (2 %), trade openness (10 %), and FDI growth (7 %) account for the fluctuations in the agricultural exports in the long- run (Fig. 3). This VDA result suggests that imports, production, openness are the major determinants of agricultural exports in Nigeria.

As shown in Fig. 3, the results also show that in the short run (4th year), the impulse to agricultural import accounts for 25 % fluctuations to its own shock. Similarly, a shock to production (21 %), exports (6 %), world price (11 %), trade openness (11 %), and FDI growth (26 %) suggest having caused the fluctuation in agricultural imports in the short run. In the long term (10th year), the results further signifies that, an impulse to production (14 %), exports (7 %), world price (18 %), trade openness (9 %) and FDI (18 %) account for the fluctuations in the agricultural imports in Nigeria (Fig. 3).

The results also reveal that impulse to production (20 %), exports (4 %), imports (48 %), world price (9 %) and the inflows of FDI (6 %) cause the fluctuation in agricultural trade openness in the log run (Fig. 3). This implies that agricultural trade openness is largely accounted by imports and production in Nigeria. By and large, a shock to imports largely causes the variation in the fluctuation in export (36 %), world price (16 %), trade openness (48 %), FDI (26 %) and agricultural ODA (20 %) in the long run. This further implies that agricultural import is a major indicator in explaining the variation of production, exports, trade openness, inflows of FDI and agricultural ODA in Nigeria.

CONCLUSION

Prior to the advent of crude oil in Nigeria, agriculture was the largest source of exports and foreign earnings, but has changed upon the discovery of oil in the country since the ends of the 1960s. Many economies across the globe have moved from agriculture as a primary source of export to other sectors of their economies. However, it becomes a source of worry when highly concentrated in a single product for export and government earnings, especially volatile commodities, such as petroleum as it has been practised in Nigeria. This contribution assesses the performance of agriculture in Nigeria in the framework of trade using both descriptive and empirical approaches. The Granger causality test shows a unidirectional causality running from imports, trade openness, world price and agricultural ODA to agricultural production in Nigeria. The VDA result also indicates that a shock to exports, imports and trade openness can contribute to the fluctuation in the variance of agricultural performance in the long run. By and large, the results suggest that agricultural performance in Nigeria is vulnerable to food import in the country, especially processed commodities.

The current global oil crunch is a wake-up call for economic diversification in Nigeria. For Nigeria to experience financial stability in the current crude oil price crash, the country to look beyond crude oil, notably, agriculture. For Nigeria to protect and encourage small-scale producers and traders, experience self-sufficiency and favourable trade balance in the agricultural sector, the local agro-processing sector should be promoted while imports of agrarian commodities that Nigeria could cheaply process at home should be discouraged. This could be done by tariff escalation, quotas and other stringent policy measures to curtail import of products that can be produced cheaply at home. A sound and stable fiscal and trade policies that encourage stable foreign and domestic investment climate in agriculture; educating producers and traders on standards and global best practices should be promoted.

In the spirit of global partnership for agricultural development, world organisations, emerging and advanced economies should continue to provide technical know-how and support to Nigeria. Globally, WTO seems to be at the crossroad at the moment in ensuring that all the AoA are implemented for mutual trade benefits. The WTO have to make sure that defensive trade remedies, such as standards

(SPS) should not be the next frontier of protectionism as these measures to some extent may well curtail export in Nigeria and in other underdeloped economies. The WTO should continue to facilitate market access for Nigerian agricultural products in importing countries by further opening their markets and reducing trade- distorting signals. Finally, the increase in the inflows of FDI, ODA and other forms of financial inflows should be promoted and channelled to the agricultural sector to improve productivity, trade, competitiveness and earnings in Nigeria.

Acknowledgements

This article was supported by IGA FRRMS MENDELU (No. 2016/012): *Agricultural Production, Trade and Economic Growth in the Sub-Saharan African (SSA) Countries*.

REFERENCES

FOLAWEWO, O. A. and OLAKOJO, S. A. 2010. Determinants of agricultural exports in oil exporting economy: Empirical evidence from Nigeria. *Journal of Economics Theory*, 4(4): 4–92.

ABOLAGBA, E. O., ONYEKWERE, N. C., AGBONKPOLOR, B. N. *et al*. 2010. Determinants of agricultural exports. *Journal Human Ecology*, 29 (3): 181–184.

ANDERSON, K. and MARTIN, W. 2005. *Agricultural trade reform and the Doha Development Agenda*. World Bank Policy Research Working Paper 3607. Washington, DC: World Bank.

ATKIN, D. and DONALDSON, D. 2015. *Who's getting globalized? The size and implications of intra-national trade costs*. NBER Working Paper No. 21439. National Bureau of Economic Research.

BECK, T., LEVINE, R. and LOAYZA, N. 2000. Finance and the sources of growth. *Journal of financial economics*, 58(1): 261–300.

BONFIGLIOLI, A. 2008. Financial integration, productivity and capital accumulation. *Journal of International Economics*, 76(2): 337–355.

CENTRAL BANK OF NIGERIA (CBN). 2013. *Annual economic report for 2013*. Abuja: CBN.

CHENERY, H. B. and STROUT, A. M. 1966. Foreign assistance and economic development. *The American Economic Review*, 6(4): 679–733.

DICKEY, D. A. and FULLER W. A. 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366): 427–431.

ECONOMIST INTELLIGENCE UNIT (EIU). 2015. *Global food security index 2015: An annual measure of the state of global food security*. Economist Intelligence Unit.

EFFIONG, J. A. L. 2016. The impact of external capital inflows on crop production in Nigeria. *International Journal of Advanced Academic Research*, 2(4): 20–43.

FAO. 2003. *World Agriculture: Towards 2015/2030: A FAO perspective*. Rome: FAO.

FAO. 2016. *FOSTAT database* [Online]. Available at http://bit.ly/NmQzZf. [Accessed 10 February 2016].

GRANGER, C. W. J. 1969. Investigating causal relations by econometric models and crossspectral methods. *Econometrica*, 37(3): 424–438.

INTERNATIONAL TRADE CENTRE (ITC). 2015. *How companies experience non-tariff measures – Survey-based evidence from developing countries*. ITC technical paper

ITC. 2016. *Trade competitiveness map: Analyse country and product competitiveness with trade flows*. [Accessed 20 January 2016]. Available at ITC website: http://bit.ly/1nIx93K.

KAREEM et al. 2013. Analysis of factors influencing agricultural output in Nigeria: macroeconomic perspectives. *American Journal of Business, Economics and Management*, 1(1): 9–15.

KRUGMAN, P. R., OBSTFELD, M. and MELITZ, M. J. 2010. *International economics: theory and policy*. 9th Edition. Pearson Addison-Wesley.

LABORDE, D. and MARTIN, W. 2012. Agricultural trade: what matters in the Doha round? *Annual Review of Resource Economics*, 4: 265–283.

LEVINE, R. 2001. International financial liberalization and economic growth. *Review of International Economics*, 9(4): 688-702.

MCCALLY, A. F. and NASH, J. 2007. *Reforming agricultural trade for developing countries: Volume one: Key issues for a pro-development outcome of the Doha Round*. Washington, DC: World Bank.

MOISE, E., DELPEUCH, C., SORESCU et al. 2013. *Estimating the constraints to agricultural trade of developing countries*. OECD Trade Policy Papers, No. 142. Paris: OECD.

MOISE, E. and LE BRIS, F. 2013. *Trade costs – what have we learned? A synthesis report*. OECD Trade Policy Papers, No. 150. Paris: *OECD*. Available at: http://bit.ly/1TbjLwK. [Accessed: 35th January 2016].

MOU, D. 2014. *State power, agrarian policies and peasant welfare: Politics of agricultural marketing and commodity boards in Nigeria*. London: Authorhouse.

OECD and WTO. 2015. *Aid for trade at a glance 2015: reducing trade costs for inclusive, sustainable growth*. Paris: *OECD*.

PHILLIPS, P. C. B. and PERRON, P. 1988. Testing for a unit root in time series regression. *Biometrika*, 75(2): 335–346.

SHIRAZI, N. S. and MANAP, A. A. 2005. Export-led growth hypothesis: further conometric evidence from South Asia. *The Developing Economies*, 43(4): 472–88.

STIGLITZ, J. E. and CHARLTON, E. 2007. *Fair trade for all: How trade can promote development*. (Revised Edition). Oxford: Oxford University Press.
UNCTAD. 2016. *World statistical database*. [Online]. Available at: http://bit.ly/1CK9hmK [Accessed: 17th January 2016].
VERTER, N. 2015. The application of international trade theories to agriculture. *Mediterranean Journal of Social Sciences*, 6(6): 209–219.
VERTER, N. and BEČVAŘOVA, V. 2014. Drivers of cocoa export in Ghana in the era of free trade. *World Applied Sciences Journal*, 32(8): 1710–1716.
VERTER, N. and BEČVAŘOVA, V. 2016. The impact of agricultural exports on economic growth in Nigeria. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 64(2): 691–700.
WORLD BANK. 2016. World development indicators. [Online]. Available at: http://bit.ly/1Cd8EkQ. [Accessed: 25 March 2016].
WORLD TRADE ORGANIZATION (WTO). 2015. *World Trade Organization annual report 2015*. Geneva: WTO..

Contact information
Ing. Nahanga Verter, Ph.D.: nahanga.verter@mendelu.cz