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Trends in foreign agricultural trade and its impact on households in South Africa

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Abstract

This study examines the trends in foreign trade in agriculture focusing on imports and exports for different sub-sectors and the identity of agricultural trade flows with specific regions and countries. Secondly, to understand how agricultural imports and exports improve the living standards of households in South Africa. The study uses a quantitative research approach by analysing trade data from the South African Revenue Services (SARS) and household data from the World Bank and OECD. The threshold vector autoregressive (TVAR) model is employed to establish a nonlinear causal relationship. The Diks-Panchenko nonparametric causality test revealed no causal relationship between the foreign agricultural trade and household consumption and household income in South Africa. However, with the increase of exported agricultural goods from South Africa, there are many significant benefits to South African households.

Keywords

Agriculture, bilateral trade, TVAR analysis, South Africa

Introduction

South Africa is tightly integrated into the global agricultural trade system. This is clear to see from its membership of and active participation in the World Trade Organisation (WTO) (Vickers, 2014). Further evidence of this is visible from trends in the values of agricultural trade (Daya et al., 2006). While the agricultural sector earns foreign revenue, it is important to know which are key tradable sub-sectors and track who are the country's main trading partners. It is also unclear how the benefits from foreign trade in agriculture might trickle down to households in South Africa. Trade between countries have become a necessary transaction and has developed into a strong source of economic growth for both developed and developing countries (Vijayasri, 2013). However, with the trading of international commodities comes an important concept of rules and regulations that countries should follow to trade (Disdier et al., 2007). Trade should be regulated by the government through implementation of quotas, licenses, subsidies and tariffs to keep commodity prices fair (Cadot et al., 2012).

The purpose of the study is to firstly establish trends in agriculture foreign trade focusing on imports and exports for different sub-sectors. Secondly, to understand how agricultural imports and exports improve the living standards of the South African households. Although there are studies that investigate the impact of agricultural trade on household welfare, there is a gap in the literature for empirical studies conducted in the South African context. This study also provides a significant methodological contribution to research through using the TVAR analysis, similar to Santeramo et al. (2014) but has only determined the agriculture import regime of the European Union (EU) and not export and import variables. The more specific objectives are to provide an economic theoretical framework for the study of bilateral trade markets in the agricultural sectors and to reduce the adverse effects of agricultural trade for households in South Africa.

South Africa's agricultural trade markets

The agricultural sector in South Africa was extensively liberalised in domestic and foreign markets over the last four decades (Greyling, 2012; Sandrey, 2007; Sandrey and Vink, 2008; Vickers, 2014; Vink et al., 2002). South Africa's domestic liberalisation for agriculture started in the 1980s while the international liberalisation began in 1993 with the Marrakech Agreement after greater momentum was gained after the first democratic government was elected in 1994 (Vink et al., 2002). The export-led strategy

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of the newly led government reoriented the South African economy (Nxazonke and van Wyk, 2020). Gaisford and Kerr (2001) confirm that a continuous increase in global trade of agricultural commodities is vital in keeping a balance between the international demand for food and the supply thereof. There is a direct correlation between the amounts of commodities that a country exports and imports to the actual size of a country's economy (Birdsall and Hamoudi, 2002; Krugman and Obstfeld, 2009; Zhang et al., 2004).

Tarrification is an important initial step towards trade liberalisation where prohibitions, trade licenses and import quotas are substituted by equivalent tariffs in order to maintain price structures (Schiff and Montenegro, 1997). Over time, the costs of trading between countries have also become more expensive (De, 2006). With tariffs and subsidies ever increasing, this affects the prices and cost of resources that are to be traded. This has a crippling effect on South African households of which the vast majority live below the poverty line. Black et al. (2006) confirm that the majority of the South African population live in extreme poverty and are characterised by an inequality in the distribution of income where approximately 25% of the total population survive on less than $1 a day.

Regulations such as tariffs, quotas and subsidies are a few measures in which government authorities can promote some sort of fairness in agricultural trade. Although government sometimes benefits from changes in regulation such as increases in tariffs, the households are adversely affected by these increases (van Wyk and Dlamini, 2018). Chitiga et al. (2008) propose that governments increasing revenue and securing local industries by increasing tariffs for trade in commodities. This has a negative impact on consumers as increasing tariffs cause increases in domestic food prices which reduces consumer welfare (Vink and Kirsten, 2002). This creates a snowball effect when the increase in prices affect suppliers due to the commercial farmers increasing their output.

Agriculture contribution towards economy

Global trade is a critical catalyst for economic growth for the developing world (Sun and Heshmati, 2010). However, global trade of agricultural commodities is globally decreasing in economic importance relative to total trade but still increasing in absolute value (Garcia Alvarez Coque, 2003). Over the last few decades, South Africa's agricultural trade expanded more rapidly than its GDP (Daya, 2014). According to Matsei (2016), agriculture's share of South Africa's GDP has significantly declined from 6% to 2% between 1970 and 2015. Despite the marginal share towards total GDP, the agriculture sector is vital for the economy. It provides sources of food security, employment, poverty alleviation and a major contributor of foreign exchange (Orden et al., 2004).

Historically, South Africa has been a net exporter of agriculture (Jooste and Spies, 2006). Recent evidence suggests that the effects of concentrated ownership of food distribution and production, rapid urbanisation and liberalisation of food trade have significantly changed the landscape of South Africa's food system in which South Africa has become a net importer of food (Igumbor et al., 2012). However, South Africa remains one of Africa's largest exporters of agricultural commodities (Hlomendlini, 2016). South Africa's largest export market remains the European Union but with the integration into the global economy, export markets are diversifying into more developing markets. Daya et al. (2006) suggest that Africa represents such a developing market whereby a total agricultural export value of 24% is accounted and further 8% of South Africa's agriculture imports are supplied by the rest of Africa. Commercial agricultural farms occupy the majority of arable land situated in South Africa. Approximately 60,000 commercial agricultural farmers own 87% of total arable land in South Africa and produce 95% of agricultural market output for export (Nieuwoudt and Groenewald, 2003).

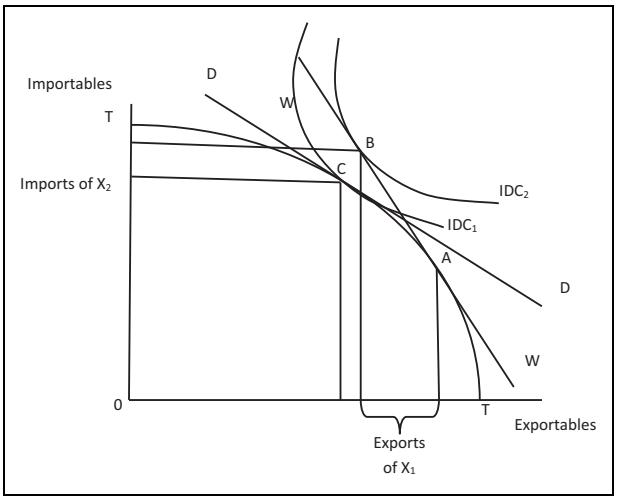

Figure 1. The open economy model. *Source*: Chowdhury and Kirkpatrick (1994).

Using macroeconomic theory, Figure 1 illustrates how imports and exports of commodities such as agriculture can be traded in an open economy. The part of the diagram that is labelled 'exports of X_1' illustrates the impact of a change in the relative elasticity of the commodity. If the demand for agricultural commodities becomes more inelastic in demand, the exports of the commodity will thus increase by the portion labelled as 'exports of X_1'. The optimal point for the relationship of imports to exports of the commodities also moves from point C to point B on the diagram because of a shift to the right of the consumers' indifference curve from IDC_1 to IDC_2. The change in consumer preference in global agricultural trade is crucial to the exportation of agricultural commodities. According to Chowdhury and Kirkpatrick (1994), the small open economy does not affect the profit and utility functions of producers and consumers whatsoever. There can be no distinction between domestic and imported commodities and therefore the substitution possibilities between X_1 and X_2 remain unchanged.

Household income and expenditure

Trade may have both negative and positive impacts on food security, affecting various social and economic variables. According to FAO (2016), domestic food prices, as well as food demand and supply are immediately affected by changes in imports and exports. The limited incomes of South African households inevitably result in inadequate food baskets (van Wyk and Dlamini, 2018). Household food baskets are largely dependent on food prices, which have substantially increased over recent years due to food inflation (Osei-Asare and Eghan, 2007). Global food inflation is highly differentiated between households in developing and developed countries and depends on the degree of transmission of global food prices within domestic economies (Hampton and Weinberg, 2014).

Food price movements in South Africa are heavily reliant on domestic influence. Furthermore, food price volatility and inflation erode real household income and have further adverse welfare impacts to households (Ngidi, 2016). It is the responsibility of policy-makers to protect South African households from escalating food prices (van Wyk and Dlamini, 2018). However, any successes from establishing domestic policies in reducing food price increases are dependent on the degree to which food price developments are caused by domestic influences or shocks (Rangasamy, 2010).

The significant impact on agricultural trade liberalisation on prices and income is especially visible in developing countries. This is derived from the vast portion of consumption expenditure on food and significant percentage of income comes from the agricultural sector. A study by Fabiosa (2008) measured the impact of agricultural trade on 158 countries based on their income share by sector, agriculture consumption expenditure and per capita GDP. The study showed an inverse correlation between the level of per capita income and the share of income derived from the agricultural sector.

The WTO's impact on household food consumption in developing countries is significant. A study by Huang et al. (2007), utilised the Agricultural Policy Simulation and Projection Model (CAPSiM) to examine agricultural trade liberalisation and poverty in China. The study confirmed that agricultural trade has a greater effect on rural residents as producers rather than as consumers of agricultural commodities. The study further confirmed that the impact of agricultural trade commodities are more significant than expenditure impacts of a geographical area of the country. Furthermore, Talukder and Chile (2013) utilised the Deaton Methodology in their study to reveal that the liberalisation of agricultural trade in Bangladesh and its impact on real income of rural households is as a result of the implementation of new technology for the agriculture sector and the excessive demand for the major agricultural commodity in the country.

Material and methods

This study investigates the impact of the trends of foreign agricultural trade on households in South Africa. In analysing the results, the threshold vector autoregressive (TVAR) model is employed to establish a nonlinear causal relationship. Annual time series data for the period of January 2010 to December 2017 accessed from secondary sources such as the World Bank, Organisation for Economic Co-operation and Development (OECD) and South African Revenue Services (SARS) database is used for this study.

Nonlinearity test

In the context of time series, preliminary methods are to be executed prior model estimation. Makatjane et al. (2017), revealed that these procedures embrace among others linear tests and or non-linear unit root tests. However, the commonly used test for the non-linear alternative hypothesis is the Ramsey RESET which is established by Ramsey (1969). However, with the current study, the focus is shifted towards the use of a white neural network test which is firstly time-honoured by White (1989). Makatjane et al. (2017) disclosed that the test is computed by firstly letting the pragmatic training set that is attained as a haphazard sequence be $Z^n = \{Z_t,\ t = 1, \ldots, n\}$,$Z_t = (Y_t, X_t)$. Having Y_t as a scalar quantity, and X_t as the row vector finite dimension, then, White (1989) rumoured Z_t to be neither identically but not independently from the past values but be distributed within $t = 1, \ldots, n$. In this case, the conditional $E(Y_t X_t)$ is the one governing the studying of the relationship between X_t and Y_t. To be more unpretentious, this can be extended to the regression function as:

$$g(X_t) = E(Y_t|X_t) \tag{1}$$

g is independent of t because of the identical distribution assumption. Here, the goal line is to investigate the competence of a given multilayer feedforward network as a representation of the unknown mapping g by considering a class of feedforward networks in which the network output scalar is determined by some given input x. At that moment, White (1989) demonstrated the network as follows:

$$o = \tilde{x}\gamma_0 + \sum_{j=1}^{q} \beta_j \delta(\tilde{x}\ \gamma_j) = f(x,\ \theta) \tag{2}$$

o is the network output and $\tilde{x} = (1, x)$ is a conformable column vector of the connection strengths form the input layer, $j = 0, \ldots, q$ with β_j being a scalar connection strength from the hidden unit j to the output unit $j = 0, \ldots, q$ while δ is a veil of secrecy function that follows either a logistic or hyperbolic tangent squasher. While, q symbolises the number of hidden units with the connection strengths that are not constrained to zero. If the network can be meticulous in representing the indefinite function g, then θ^* is computed as vector of the connection strengths such that $g(X_t) = f(X_t, \theta^*)$ with the probability being 1. Consequently, the null hypothesis is formulated as:

$$H_0:\ P[g(X_t) = f(X_t, \theta^*)] = 1 \text{ for some } \theta^* \tag{3}$$

This establishes a detailed statement of the null hypothesis of interest. Henceforth, the alternative is that the network is unable to exact the representation of g and it is formulated as:

$$H_a: P[g(X_t) = f(X_t, \theta^*)] < 1 \text{ for all } \theta \quad (4)$$

A statistical test of the null hypothesis is a Lagrange multiplier test of Engle (1982) and the test is based on the linear regression

$$\hat{\varepsilon}_t^2 = \eta_0 + \sum_{i=0}^{m} \eta_i \varepsilon_{t-i}^2 + e_t \quad (5)$$

where, $\eta_0, \ldots, \eta_m$ are the parameter estimates and $\upsilon_t \tilde{}$ i.i.d$(\mu = 0, \sigma_\varepsilon^2 = 1)$ and the test statistic is the usual F-statistic:

$$F^* = \frac{\left(\frac{RSS}{TSS}\right) \Big/ m}{1 - \left(\frac{RSS}{TSS}\right) \Big/ n - m - 1} \sim F_{\alpha,(m,\, n-2m-1)} \quad (6)$$

where the regression sum of squares is RSS and TSS is the total sum of squares from the model (5) respectively. In general, the quantity $\frac{RSS}{TSS}$ is the mathematical computation of the coefficient of determination also known as R^2. Reject the null hypothesis if the F value is greater than critical value of $F_{\alpha,(m,\, n-2m-1)}$ and conclude that the time series data are nonlinear in nature.

TVAR framework for detecting the trends of foreign agricultural trade

This study uses methods that conform to the analysis of time series data. Time series analysis contains procedures for analysing time series data keeping in mind the end goal to separate important measurements and different attributes of the data. As per Jonathan and Kung-Sik (2008), the motivation behind time series analysis is by and large twofold: (1) to comprehend the stochastic mechanism that offers ascendency to an observed series and (2) to forecast the future values of a series in light of the historical backdrop of that series and perhaps, other related series. The review of TVAR in this section is motivated by Hubrich and Teräsvirta (2013) who suggested the following equation:

$$y_t = \sum_{i=1}^{q} \left(\mu_i + \sum_{j=1}^{p} \Phi_{ij} y_{t-j} + \Gamma_i x_t + \varepsilon_{it} \right) I(C_{i-1} < S_t \leq C_i) \quad (7)$$

where y_t and ε_{it}, $j = 1, \ldots, q$ are the stochastic vectors of $m*1$ while $m*1$ vectors of the intercept is denoted by μ_i for $i = 1, \ldots, q$. Moreover, Φ_{ij} is the coefficient matrices of the $m * m$ dimensions with $i = 1, \ldots, q$ and $j = 1, \ldots, q$. In addition, Γ_i is the $m * n$ coefficient matrices for $i = 1, \ldots, q$ and $C_0 = -\infty$ and $C_q = \infty$. According to both Tong (2012) and Hubrich and Teräsvirta (2013), (7) becomes a TVAR model when $\Gamma_i = 0$ for all i. ε_{it} are serially uncorrelated with mean 0 and positive definite covariance matrix $\sum_i, i = 1, \ldots, q$. x_t is the vector that comprehends n stationary variables that are strongly exogenous for the parameters of the model. If the stationary variable S_t is being replaced by t/T, where T is the number of observations, (7) becomes a linear regression vector (RV) model with q-1 breaks.

In (7), a single stationary and continuous switch-variable S_t determines the regime of the whole system. This assumption has been relaxed by Tena and Tremayne (2009) such that each equation may have a separate switch-variable and some equations may even be linear. A systematic modelling strategy for TVAR models with applications can be found in Tsay (1998). Finally, it may be noted that substituting a latent indicator for the observable S_t, in (7) yields the following RV model:

$$y_t = \sum_{i=1}^{q} \left(\mu_i + \sum_{j=1}^{p} \Phi_{ij} y_{t-j} + \Gamma_i x_t + \varepsilon_{it} \right) I(S_t \leq v_i) \quad (8)$$

in which the indicator variable S_t is defined similarly to the single-equation model of Lindgren (1978). Typically, the switches in all equations are controlled by the same indicator function, as is the case in (8). This assumption can be relaxed, however, see Sims et al. (2008). Recent economic applications include Sims and Zha (2006) and Hubrich and Tet-low (2012). Their approach is Bayesian; for more details and discussion in the classical framework, see Krolzig (1997) and Jacobson et al. (2002).

Diks-Panchenko nonparametric causality test

Granger proposed a causality test to portray the reliance relations between economic time series. As per this, if two variables $\{X_t, Y_t \geq 1\}$ are strictly stationary,$\{Y_t\}$ Granger causes $\{X_t\}$ if past and current values of X_t contain additional information on future values of Y_t. Suppose F_{Xt} and F_{Yt} denote the information sets consisting of past observations of X_t and Y_t for time t, then, $\{Y_t\}$ Granger causes $\{X_t\}$ if:

$$(Y_{t+1}, \ldots, Y_{t+k}) | (F_{X,t}, F_{Y,t}) \sim Y_{t+1}, \ldots, Y_{t+k} | F_{X,t} \quad (9)$$

$k \geq 1$ in this case. However, in practice, $k = 1$ is more often used. Nevertheless, Granger non-causality can be tested by comparing the one-step-ahead conditional distribution of $\{Y_t\}$ with and without past and current observed values of $\{X_t\}$. to test for Granger causality, we consider a two stationary time series with a mean model $E(Y_{t+1}(F_{X,t}, F_{Y,t}))$. We compute the residuals of a fitted TVAR. Suppose that $X_t^{\ell X} = (X_{t-\ell X+1}, \ldots, X_t)$ and $Y_t^{\ell Y} = (Y_{t-\ell Y+1}, \ldots, Y_t)$ are the delay vectors where $\ell_x, \ell_Y \geq 1$. The null hypothesis to be tested is:

$$H_0: Y_{t+1} | (X_t^{\ell_x}; Y_t^{\ell_Y}) \sim Y_{t+1} | Y_t^{\ell_Y} \quad (10)$$

The null hypothesis becomes a statement about the invariant distribution of the $(\ell_X + \ell_Y + 1)$-dimensional vector $W_t = (X_t^{\ell_x}, Y_t^{\ell_x}, Z_t)$. Ignoring the time index and if $\ell_X = \ell_Y = 1$, the t distribution of Z given that $(X, Y) = (x, y)$ is the same as of Z given $Y = y$

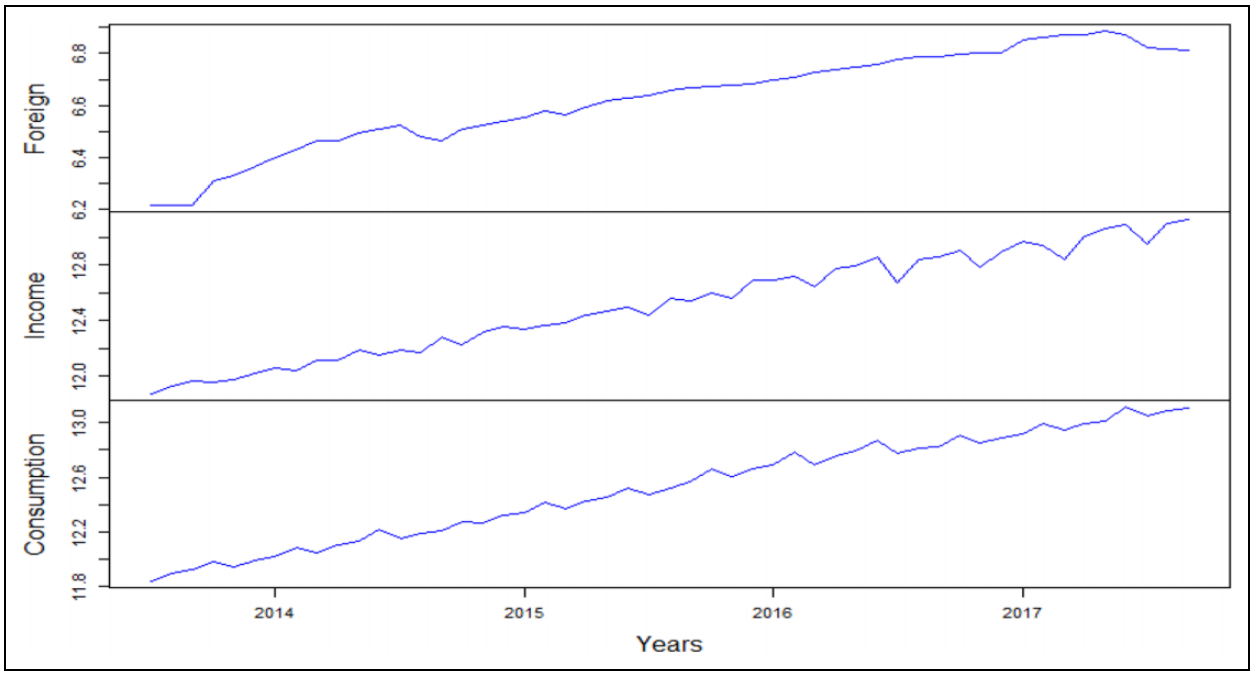

Figure 2. South Africa foreign trade, household income and household consumption.

respectively. Nonetheless, in order to take account of the ratios of the joint distributions, (10) is restructured (Karagianni et al., 2013). In that sense, the joint probability density function $F_{X,Y,Z}(x,\ y,\ z)$ and its marginals should satisfy the following relationship:

$$\frac{F_{X,Y,Z}(x,\ y,\ z)}{F_Y(y)} = \frac{F,\ X,Y(x,y)}{F_Y(y)} * \frac{F,X,Z(y,z)}{F_Y(y)} \qquad (11)$$

As per Diks and Panchenko (2006), the null hypothesis simplifies to:

$$q \equiv E\left[F_{X,Y,Z}(X,\ Y,\ Z)F_Y(Y) - F_{X,Y}(X,\ Y)F_{Y,Z}(Y,\ Z)\right] = 0 \qquad (12)$$

Then, the test statistic is a scaled sample version of q in equation (12):

$$T_n(\varepsilon_n) = \frac{n-1}{n(n-2)} * \sum_i \left(\hat{f}_{X,Y,Z}(X_i,Y_i,Z_i)\hat{f}_Y(Y_i) - \hat{f}_{X,Y}(X_i,Y_i)\hat{f}_{Y,Z}(Y_i,Z_i)\right) \qquad (13)$$

for $\ell_X = \ell_Y = 1$, and if $\varepsilon_n = C_n^{-\beta}\left(C > 0, \frac{1}{4} < \beta < \frac{1}{3}\right)$, therefore Diks and Panchenko (2006) attested that the test statistic in (13) satisfies the following condition:

$$\sqrt{n}\frac{(T_n(\varepsilon_n) - q)}{S_n} \xrightarrow{D} N(0,1) \qquad (14)$$

$\xrightarrow{D}$ denotes convergence in distribution and S_n is an estimator of the asymptotic variance of $T_n(.)$ (Karagianni et al., 2013). In this study, the Karagianni's suggestion, to implement a one-tailed version of the test, has been employed. The null hypothesis is rejected if the observed probability value is greater than the critical probability value.

Results

It is of much importance to assess the time series patterns prior modelling and data analysis. The identified time series properties help in the decision on the type of the model to be estimated. Revealed in Figure 2 is the time series plot of foreign agricultural trade, household income and household consumption in South Africa.

By visual inspection, the three-time series are moving in the same direction with the same wavelength. This serves as a strong motivation to use these variables with the proposed methods. Since 2013, the movements of the series advocate the long-run relationship prior daunting transformation to the data. Because, macroeconomic data is expected to be volatile, this is evident from Figure 2 by the vacillating movements. These series are as a result perfectly suitable to serve as experimental units for this study.

White neural network test for nonlinearity

Prior TVAR estimation, the paper estimates a white neural network test to confirm the null hypothesis of linearity against nonlinearity in the variables. The results of a white neural network test for nonlinear alternative test are presented in Table 1. At 5% level of significance, all the variables are nonlinear in nature. The insinuation here is that the data is suitable for application of the nonlinear models.

Threshold vector autoregressive framework

This section presents the results of a TVAR long-run relationship method as summarised in Table 2. By utilising the Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC) and Hanan-Quin information criterion (HQC), which are the most extensively jumble-sale information criterions in the empirical literature of model

Table 1. White neural nonlinear test.

	Foreign agriculture	Household income	Household consumption
Coefficient	88.615	133.629	52.224
p Value	0.000	0.000	0.000

Table 2. Threshold vector autoregressive model.

Lower regime		
Parameter	Estimate	Std error
Φ_{11}	0.060	(0.0129)***
Φ_{21}	−1.326	(0.2535)***
Φ_{31}	−0.869	(0.1984)***
Upper regime		
Parameter	Estimate	Std error
Φ_{12}	0.056	(0.0196)**
Φ_{22}	−0.579	(0.1749)**
Φ_{32}	−0.511	(0.1823)**

Note: ***Significant at 1%; **significant at 5%; *significant at 10%. Numbers in () are standard errors.

Table 3. Mwald bootstrap test.

Modified Wald test	Test statistic	Critical value
Mwald test	16.469	14.287

selection, we select the optimal lag length of 1 for the TVAR model. However, literature revealed that BIC is the best criterion to select the model. An enhanced Johansen long-run framework is more appropriate as it billets data with structural breaks. Table 2 illustrates the results from the TVAR model.

Using a modified Wald statistic (herein referred to as *Mwald* in Table 3) bootstrapping 200 replications, we find the critical threshold to be significant at 5%. The test statistic is greater than the critical value of 14.287. We, therefore, conclude that there is a long-run relationship between the investigated variables (foreign agricultural trade, household income and household consumption).

Diks-Panchenko causality test

Since the estimated TVAR(1) confirmed the presence of long-run nonlinear relationship between the foreign agricultural trade, household income and household consumption. The paper then follows up with Diks-Panchenko Causality test and the results are presented in Table 4. The results obtained from the test indicate a bi-directional causality between household income and the household consumption. However, this also exposed that there is no causal relationship between foreign agricultural trade and household income and household consumption in South Africa.

Table 4. Diks-Panchenko nonparametric causality test.

Group	Diks-Panchenko test
Foreign	[16.203]
Income	[10.326]***
Consumption	[19.899]***

Note: ***Significant at 1%; **significant at 5%; *significant at 10%. Numbers in [] are nonparametric t statistic.

Discussion

The objective of the study is to establish trends in agricultural foreign trade focusing on imports and exports for different sub-sectors and understanding how agricultural imports and exports impact households in South African households. To achieve this objective, the unique TVAR and nonlinear causality test is utilised similar to that of Santeramo et al. (2014) in determining the efficacy of the EU agriculture import regime.

Agricultural trade is closely regulated by policy-makers to prevent market failures. Government authorities control global agricultural trade through implementing quotas, trading licenses, taxes and tariffs (Cadot et al., 2012). The government also subsidises producers of agricultural commodities as an incentive to interact in global trade for small and large-scale agriculture producers (Swain, 2009). The effects of tariffication and taxation of exported and imported commodities have been trickling down to households of South Africa.

The impact of the foreign agricultural trade to households in South Africa is not perfectly significant as the trends of the foreign agricultural trade discovered in coefficients of the TVAR model are inversely proportional to household income and household consumption in South Africa for both regimes. Even though South Africa has an increased foreign trade in agricultural products since the past decade (Potelwa et al., 2016), this does not mean that households in South Africa have a significant benefit on the products because Rossouw et al. (2014) showed any change to the monetary sector affects short-term liquidity in the monetary system, which suddenly has an effect on other rates.

When reviewing the results from a TVAR long-run relationship, when applying equation 11-12, the procedure yields a threshold parameter of $\gamma = 0.0123$. This threshold parameter divides the estimated TVAR(1) model in the two regimes. Regime 1 which is denoted by the lower regime in this study represents those monthly observations which are absolutely deviated from the long-term equilibrium and in the current study, these deviations comprises of 51%. For every observation in regime 2, the absolute deviation from the long-term equilibrium is above 49%.

With the increase of taxes and tariffs on imported commodities, households have resulted in paying higher amounts for food (van Wyk and Dlamini, 2018). It has also resulted in crippling the employment market for small-scale farmers who trade the agricultural products to sustain their livelihoods. This negatively impacts the poorer households in South Africa and affects the economic growth of

the country. Hence the Diks-Panchenko nonparametric causality test revealed no causal relationship between the foreign agricultural trade and household consumption and household income in SA. This is similar to the findings of Santeramo et al. (2014). However, with the increase of exported agricultural goods from South Africa, there are many significant benefits to South African households.

Conclusion and policy recommendation

South Africa's global agricultural trade forms an important source of revenue. A positive trade balance for South Africa on its B.O.P benefits households while a negative trade balance with the trade of agricultural commodities has a negative impact on households in South Africa. Global agricultural trade has been increasing in absolute value for South Africa. However, the significance of agricultural trade as a contribution towards GDP has slowly declined over the past few decades which is evident from the results of the TVAR (1) model.

There will be an increase in revenue for South Africa with the positive trade balance. This enhances economic growth which improves living standards in terms of employment in the agricultural farming sectors, cheaper food products and overall GDP growth. The local authorities in the government should ensure that the small-holder farmers in rural areas are assisted in the production of their agricultural commodities, in the forms of subsidies and grants.

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