International Journal of Finance, Insurance and Risk Management
Volume X, Issue 3, 2020

pp. 117-131

Short and Long-Run Impact of Trade Liberalization on Agricultural Growth in Kenya

Submitted 11/05/20, 1st revision 22/07/20, 2nd revision 19/08/20, accepted 30/09/20

Kemboi Michael Kipkorir[1], Martine Oleche[2]

Abstract:

Purpose: *The focus of the study was on establishing the short and long-run impact of trade liberalization on agricultural growth in Kenya. Emphasis was on the influence of tariffs, foreign direct investment and trade openness on agricultural growth in Kenya.*
Approach/Methodology/Design: *The study utilized time-series data from 1980 to 2017. The source was the World Bank Development Indicators. The autoregressive distributive lag bounds test ascertained whether there was cointegration.*
Findings: *The study established that trade openness is critical in enhancing agricultural growth in Kenya. As Kenya opens its borders for smooth movement of agricultural produce, there is a resultant increase in outputs for the domestic and foreign markets. Besides, foreign direct investment contribution to agriculture is negative since it tends to relate to other sectors of the economy other than agriculture. Consequently, farmers are less likely to benefit from technology transfer and the advent of new processes in agriculture. Further, tariffs did not influence agricultural growth in Kenya probably because, despite Kenya making commitments to liberalize its trade, the implementation of the policies on free trade was not forthcoming.*
Practical Implications: *The study contributes to the understanding of how open trade influences growth in the agriculture sector in Kenya. It reflects that trade openness is detrimental to agricultural growth in the short-run but vital in spurring growth in the agricultural sector in the long-run.*
Originality/Value: *The study validates the firm heterogeneity model by establishing that open trade in agriculture, increases the capacity of productive firms to the extent of exporting products in international markets. Also, the negative influence of foreign direct investment on agricultural growth confirms the theory's assertion that investments are channeled to high potential sectors of the economy.*

Keywords: *Agricultural growth, trade openness, tariffs, Foreign Direct Investment.*

JEL codes: *O1, O2.*

Paper Type: *Research article.*

[1]*Research Analyst, Researchcannon, Email: rop.michael.mr@gmail.com; ORCID ID: https://orcid.org/0000-0002-9862-0819 Website: https://researchcannon.com/*
[2] *Lecturer, School of Economics,University of Nairobi, odhiambomo2004@gmail.com;*

1. Introduction

The liberalization of trade elicits a lot of mixed reactions across the globe since it exposes local cottage industries to increased competition on the one hand and increases the ease of knowledge and technology transfer on the other (Baldwin and Evenett, 2009). As such, it places under industrialized countries at a disadvantage, because their economies rely heavily on agriculture, mainly if their tax laws are not robust enough to reduce the cost of acquiring better machinery and modes of production. As a consequence, developing countries have to overcome a lot of challenges and constraints for their produce to compete favourably in global markets (Kemboi, 2020).

Empirical evidence suggests that allowing liberalized trade in agriculture encourages the growth of the sector by creating an environment that promotes investor confidence (Liargovas and Skandalis, 2012). As a result, not only does it influence the size of the pool of investors willing to pump in resources directly into farming enterprises, but also their quality. That is to say that investors, especially foreign ones, are willing to, and indeed make, significant financial investment directly into agricultural processes and concerns, therefore, resulting in a considerable increase in output levels and quality (Andersen and Babula, 2009).

However, despite all the potential opportunities for growth and development that opening up trade in agriculture offers, the demands it places on efficiency often bring about a myriad of socioeconomic problems particularly in developing countries because of the infancy of their structures (Lee, 2005). High unemployment, poor living conditions due to low wages, skewed development of infrastructure and price exploitation are some of the problems that arise from trade liberalization. What is more, is that so far, there is little evidence of success in increasing the level of agricultural output in countries that have implemented trade liberalization strategies. Most information points to trade liberalization as a cause of the reduction in production output. Also, the high government borrowing that often accompanies the institution of open trade policies causes' inflation that affects producer earnings adversely.

Furthermore, regardless of all the real-life examples available to work with, evidence on how open trade affects agricultural growth remains unclear because of how intricately agriculture ties into overall economic performance especially in Africa (De Silva *et al.,* 2013). As such, there is a significant knowledge gap on the implications of opening up trade, especially in agriculture, that further disadvantages decision making, particularly in developing nations (Blake *et al.,* 2002). This study, therefore, sought to pursue the topic with a holistic approach so that it uncovers more than the trends in the performance of agriculture markets post-liberalization. As well, because of the broadness of the indicators used to measure trade liberalization, this study limits itself to trade openness, tariffs and foreign direct investment because of how they affect both the upstream and downstream stages of agricultural production.

2. Literature Review

2.1 Theoretical Review

The firm heterogeneity model best explains the long and short-run implication of liberalized trade on the growth in the agricultural sector. The theory argues that firms are heterogeneous entities with varying levels of production (Melitz, 2003). Furthermore, there is an improvement in the overall productivity across firms with a reduction in trade costs. As well, the firms in high potential sectors exhibit significant growth with increased investment. The theory predicts that firms engaging in global trade but are least productive exit the market. On the other hand, productive non-exporting firms upscale their production levels to the extent of exporting to global markets. Besides, with the decline in exportation costs, the current exporters also expand their sales internationally (Bernard *et al.*, 2003).

The theory differentiates firms according to their profitability levels and exporting potential in terms of cut-off thresholds. The level of production for a firm to obtain non-negative profits constitutes the first threshold while the second threshold differentiates exporting from non-exporting firms. As such, firms whose productions levels were below optimum levels before the opening up of the economy to global trade are not in a position to cope with the foreign competition; hence they exit the market. Some studies in the agricultural sector have extensively used the firm heterogeneity model. For instance, Golpinath *et al.* (2007) postulated that farmers expand their production levels depending on the market potential. Farmers may choose to enhance or reduce their exports to global markets depending on export favorability. In a similar vein, Ahn *et al.*, (2011) espoused that the production levels of farmers determine whether they will fall in the category of exporters or non-exporters. Accordingly, the study intends to validate the theory of firm heterogeneity by examining the contribution of open trade to the growth in the agricultural sector.

2.2 Hypotheses Development

Trade openness is the intensity of both trade regulations and restrictions by a given country to other global trade partners (Gulzar, 2016). Several empirical works have addressed the contribution of openness to trade on the growth in agriculture. From a global outlook, opening up trade in agriculture has far-reaching implications, especially for Sub-Saharan countries. In a study by Nuetah (2018), it was established that liberalizing agricultural trade in both the European Union and the United States negatively impacted Sub-Saharan countries that were beneficiaries of trade preferences. Notably, the countries in Sub-Saharan Africa could not compete favourably with other economies that had mechanized their agricultural processes and were not dependent on agriculture as a driver of the economy.

Hye and Jafri (2011) sought to establish the link between the growth in agriculture in Pakistan and freer trade. The data utilized covered the period between 1971 and

2009. The ARDL model tested the long-run association. The cointegration results indicated that freer trade brought about growth in the agricultural sector. Darmawan (2014) also assessed the impact of freer trade on Agriculture in the Indonesian context. The time-period spanned from 1961 to 2013. The ECM was used to ascertain whether openness to trade and productivity growth in Agriculture exhibited a long- and short-term relationship. Evidently, in the long-term, freer trade is deterrent to the growth in agriculture because it led to the importation of agricultural produce.

In Nigeria, Bernard (2014) delved into the consequences of higher trade openness on the agricultural sector. In the study, the performance in the agricultural sector was an indicator of overall growth in the economy. The data used covered 42 years right from 1970 to 2012. ARDL and ECM were used to establish if openness to trade exhibited a link with the growth in agriculture. From the results of the Bounds test, there was no evidence of a relationship. Nevertheless, in short -run, freeing up trade was deleterious to the growth of the agricultural sector. The study, therefore, hypothesized that:

H_{O1}: Trade openness has a significant influence on agricultural growth in Kenya.

Tariffs are duties imposed on imports that generate revenue for the government while also giving domestic producers an edge over foreigners (WTO, 2015). In Indonesia, the elimination of tariffs led to an increase in the volume of maize imports to the country (Umboh *et al.*, 2014). Consequently, the price of maize in Indonesia declined. This adversely affected farmers in Indonesia since land under maize production reduced by a significant margin. Furthermore, Joramo (2016) investigated the implications of tariffs on Norwegian agricultural imports. The study estimated trade elasticities with the use of regression analysis. Panel data for the period 2003-2013 indicated that tariffs had no independent influence on the agricultural goods imported. The implication was that market power prevented the prices from adjusting accordingly.

Azarnert (2014) evaluated the influence of tariffs on the volume of exports from emerging economies. The results of the analysis indicated that the reduction of tariffs shifts the demand for agricultural exports to foreign markets. Reduction of tariffs affected other trade partners as they also made efforts towards removing constraints to trade on their end. The study implied that the reduction in tariffs brings about productivity gains in agriculture. As well, it makes it plausible for emerging economies to develop sectors with high growth potential.

Regarding the effect of tariffs on agricultural growth, Chang and Hayakawa (2014) did an analysis that aimed at determining the impact of eliminating the tariff barriers that exist in agricultural trade. The model incorporated by the study was the computable general equilibrium. The results indicated that the elimination of import

tariffs facilitated the trade in agricultural produce and at the same time, boosted the net inflows of investment in agriculture. The study, therefore, hypothesized that:

H_{O2}: Tariffs have a significant influence on agricultural growth in Kenya.

A country's trade policy can either encourage or discourage investments in the agricultural sector. Galiani and Porto (2010) analyzed Argentinian trade policies over 60 years to uncover the reasons behind the dismal economic progress in the country. The authors noted that despite the country experiencing exponential economic growth at the turn of the 21st century, it had not fully developed in the past decade. The study established that the overemphasis on the manufacturing sector despite the country boasting of comparative advantage in Agriculture had contributed to the Argentine debacle.

Oloyede (2014) examined the contribution of FDI to the growth in agriculture in Nigeria. The study utilized the time-series design. The variables of interest were FDI and domestic credit. From the cointegration findings, FDI is critical in enhancing agricultural growth. Specifically, agricultural productivity was brought about by a rise in both domestic financing and investments from foreigners. The study concluded that it is utmost necessary to open up the agricultural trade so that it can benefit optimally from the inflows of investment from foreigners.

In Kenya, Njoki, and Sahal (2016) assessed the influence of FDI on productivity improvement in Agriculture. The study utilized data from 1980 to 2012. Stationarity was tested with ADF test while the presence of cointegration with OLS. The findings were in tally with that of the existing empirical work which alluded that FDI had no impact on agriculture. However, the inflows of investment were vital in the growth of the service industry. The study recommended that Kenya engages in attracting more foreign investment since it is critical in the growth of the service sector. The study, therefore, hypothesized that:

H_{O3}: Foreign Direct Investments have a significant influence on agricultural growth in Kenya.

3. Methodology

The study incorporated econometric time series. The approach was selected because the variables of interest covered 37 years ranging from 1980 to 2017. The source of the data was World Development Indicators. The data was purely secondary. The Auto-Regressive Distributive Lag Bounds (ARDL) test was the method used to ascertain trade liberalization effect on the subsequent growth in agriculture.

The paper utilized time-series data to establish the influence of trade liberalization on growth in agriculture. The Augmented Dickey-Fuller test established whether there was stationarity. Before running the Auto Regressive Distributive Lag Bounds test,

the study assessed if the variables met the assumptions of the model. ARDL Bounds test followed to establish whether the variables of interests exhibited cointegration. The ARDL and error correction model was estimated after establishing the existence of cointegration.

The dependent variable in the study was agricultural growth in Kenya proxied by real agricultural GDP growth rate. For the predictor variables, the sum of imports and exports as a share of the total GDP was the measure for trade openness. On the other hand, the net inflow of investment from foreigners to the Kenyan economy as a share of the GDP proxied FDI. Since the data on tariffs is not readily available, it was derived by summing up all the taxes on foreign trade then dividing it with total imports.

The study conducted diagnostic tests before estimating the main model. These tests included stationarity, normality, heteroscedasticity and serial correlation. Once these assumptions were met, the ARDL bounds test ascertained the existence of a short and long-run relationship between open trade regime and agricultural growth in Kenya.

Normality is a critical assumption in multivariate analysis (Hair *et al.*, 2010). It assumes that the errors in the prediction value of the outcome variable are distributed normally. The Jarque-Bera Test was used to ascertain if the prediction value of the dependent variable were distributed normally.

Unit root was tested with the ADF test. In situations whereby, the error terms correlate with its previous terms, the ADF adds the difference of both the present and past values of the outcome variable to the regression equation. The hypothesis of a unit root is rejected when the computed test statistic is more than the critical value at 95% confidence level.

In order for the regression model to hold, the variance of the error term needs to be constant. In situations whereby the error terms have no constant variance, they are heteroscedastic. The presence of heteroscedasticity was tested with White's Test.

Autocorrelation was tested with Breusch Godfrey test. The test was chosen because it makes it possible to test for serial correlation through several lags other than just one lag which is a correlation between the residual between time t and t -1.

The ARDL technique is appropriate for variables that are stationary at their absolute level and those that are stationary after the first difference. However, it is unstable for variables that have undergone second differencing (Fosu and Magnus, 2006). There are three probable outcomes of the stationarity test. The series could be stationary at an absolute level, stationary after the first difference or a combination of both. The third possibility with the combination of both variables' stationary at an absolute level and after the first difference requires the bounds test for cointegration.

The generalized ARDL (*p, q*) model is specified as:

$$\boldsymbol{Y_t = \gamma_{0i} + \sum_{i=1}^{p} \quad \delta_i\, Y_{t-1} + \sum_{i=0}^{q} \beta^1 X_{t-1} + \varepsilon_{it}} \tag{1}$$

where:
Y_t = vector (meaning each variable can be used as the dependent variable).
X_t = the variables allowed to be stationary at an absolute level or after first difference or cointegrated.
β and δ = Coefficients.
γ = the constant or the intercept.
i = ranges from 1 to k, and it typifies the number of variables in the model.
ε_{it} = vector of the error terms which is serially uncorrelated.
To perform the bounds tests for cointegration, the conditional ARDL (p_1, q_1, q_2, q_3) model with four variables was specified as:

$$\boldsymbol{\Delta Y_t = a_{01} + b_{11} Y_{t-i} + b_{21} TO_{t-i} + b_{31} FDI_{t-i} + b_{41}\, TA_{t-1} + \sum_{i=1}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{q} \alpha_{2i} \Delta TO_{t-i} + \sum_{i=1}^{q} \alpha_{3i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \alpha_{4i} \Delta TA_{t-i} + e_{1t}} \tag{2}$$

where Y is real GDP in agriculture, TO is trade openness, FDI is foreign direct investments and TA is tariffs. The difference operator is Δ, while p and q are the lag orders for the dependent and independent variables, respectively. If there is no cointegration, the ARDL (p_1, q_1, q_2, q_3) model was specified as:

$$\boldsymbol{\Delta Y_t = a_{01} + \sum_{i=1}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{q} \alpha_{2i} \Delta TO_{t-i} + \sum_{i=1}^{q} \alpha_{3i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \alpha_{4i} \Delta TA_{t-i} + e_t} \tag{3}$$

If there is cointegration, the error correction model (ECM) representation was specified as:

$$\boldsymbol{\Delta Y_t = a_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{q} \alpha_{2i} \Delta TO_{t-i} + \sum_{i=1}^{q} \alpha_{3i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \alpha_{4i} \Delta TA_{t-i} + \lambda ECT_{t-1} + e_t} \tag{4}$$

where:
Y_t = Real GDP in agriculture.
TO = Trade Openness.
FDI = Foreign Direct Investment.
TA = Tariffs.

Consequently, in the event of cointegration, both the short-run (ARDL) and long-run error correction (ECM) model are specified. The outcome of the bound test would, therefore tell whether to specify an error correction model or an ARDL model. According to Pesaran *et al.* (2001), the calculated F-statistics derived from the

ARDL approach is compared to both the lower and upper bound critical values. In case the computed F-statistic falls below the lower bound, I (0) there is no cointegration, but if the F-statistic is greater than the upper critical bound, I (1) there is cointegration. If the F-statistic fall within the bounds, the inference is considered inconclusive.

4. Results and Discussion

The summary statistics for trade openness, FDI, tariffs and real GDP agriculture are presented in Table 1. Based on the findings, within the period 1980 to 2017, trade openness was at a mean of 52.912. Trade openness had a maximum value of 72.858, which was elicited in the year 1993 when Kenya made efforts towards the reduction of tariffs. This, in turn, attracted foreign firms that boosted the aggregate exports and imports. In 2016, the lowest ever trade openness was evidenced at 30.951 due to the weakening of the Kenya shilling and the deterioration of the total value of oil imports. The net inflows of investment (FDI) were at 0.731%. FDI was at a high of 3.457% in 2011 and a low of 0.005% in 1988. The tariffs, on the other hand, are at a mean of 6. 226. The maximum and minimum values for tariffs are at 14.489 and 0.690, respectively. In 1980, the tariff rate was lowest since Kenya had just signed its first Structural adjustment loan and was on the premise of ensuring that there is import liberalization. Finally, the real GDP in agriculture was at 3.716%. The values for real GDP in agriculture have elicited a mixed trend with the minimum value being -4.52 and the maximum 11.658.

Table 1. *Descriptive Results (N = 38)*

Variables	Mean	Std. Dev.	Min	Max
Trade Openness	52.912	9.9213	30.951	72.858
Foreign Direct Investment	0.731	0.8200	0.005	3.457
Tariffs	6.226	4.2149	0.690	14.489
Real GDP Agriculture	2.438	3.716	-4.52	11.658

Source: *Africa Development Indicators.*

The Jarque – Bera test was utilized in testing normality. The decision criteria for the test is that if the Chi (2) values are higher than the p-value, then there is a normal distribution. Table 2 shows that Chi (2) is 0.4654. The value surpasses the threshold value of 0.05, meaning there is no violation of normality.

Table 2. *Jarque-Bera Test for Normality*

Jarque-Bera	Normality test: 0.4654 Chi(2) 0.7924
Jarque-Bera	test for Ho: normality:

Source: *Own calculations.*

Unit root was tested with the ADF test. In case the computed test statistic is more than the critical value at 95% confidence level, then the hypothesis of a unit root is rejected. As evidenced in Table 3, test statistics for FDI is -3.335, which is less than

2.969 at the 95% confidence level. The implication is that FDI is stationary. Besides, the test statistic for real GDP agriculture is -6.312 way below the critical value of -2. 969. Therefore, FDI and real GDP agriculture are stationary at their absolute level. However, the test statistics for tariffs is -1.967, meaning that at the absolute level, tariffs are non-stationary. As such, the series requires differencing to make it stationary. As shown in Table 3, tariffs are stationary after the first difference since the test statistic (-5.288) is below the critical value (-2.972). Also, at the absolute level, trade openness had a test statistic of -2.852, which was above the critical value (-2.969) at 95 percent confidence level an indication it was non-stationary. Nonetheless, trade openness had a test statistic of -5.590, which was lower than the critical value (-2.972) after the first difference. Therefore, the appropriate test is the ARDL test since there was no second-order differencing.

Table 3. *Unit Root Test*

ADF test	**Variable**	**Test Statistic**	**5% value**	**P-value**
	Trade Openness	-2.852	-2.969	0.051
	FDI	-3.335	-2.969	0.013
	Tariffs	-1.967	-2.969	0.301
AtAbsolute Level	RGDP Agriculture	-6.312	-2.966	0.000
	Trade Openness	-5.590	-2.972	0.000
First Difference	Tariffs	-5.288	-2.972	0.000

Source: *Own calculations.*

The study tested homoskedasticity using the White test. The findings in Table 4 indicated that Chi2 (20) was 24.50, the probability value of 0.2213, revealing that the null hypothesis was accepted; hence the assumption of homoskedasticity was not violated.

Table 4. *Test for Heteroscedasticity*

White's Test	Null hypothesis: Alternative hypothesis:		Homoskedasticity unrestricted heteroskedasticity
	chi2(20)	24.50	
	Prob > chi2	0.2213	

Source: *Own calculations.*

The serial correlation was checked with the Breusch Godfrey test. From the findings in Table 5, the Prob > chi2 value of chi2 statistic (0.4137) is insignificant at a 95 percent confidence level hence no autocorrelation.

Table 5*. Autocorrelation Test*

Breusch-Godfrey LM test for autocorrelation			
Lags (p)	chi2	df	Prob>chi2
1	0.668	1	0.4137
H0: no serial correlation			

The assumptions of the ARDL model have to be met before proceeding to the cointegration test. The assumption of constant variance, normality, no serial correlation and stationarity were met for the ARDL model. Following the diagnostic tests, the bounds test was done to establish if there is cointegration. The decision criteria for the Bounds test is that, if the determined F- statistic is higher than the critical value for the upper bound I (1), at that point we can say there is cointegration.

On the other hand, if the determined F-statistic is below the critical value for the lower bound I (0), the choice is made to run the short-run ARDL model since there is no cointegration. The test is inconclusive if the determined F- statistic falls between the upper and lower bound. The computed F- statistic of the test was contrasted with the upper and lower bounds at the 95% confidence level. Table 6 indicated that the F–statistic (10.883) is higher than the upper bound (3.79) critical values an indication of cointegration. This, therefore, necessitated the error correction model.

Table 6. *ARDL Bounds Test*

Ho: no levels relationship							
	Critical Values						
	10%		5%		1%		Calculated F-
Lower & Upper Bounds	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	Statistic
Model	3.41	4.68	2.62	3.79	2.26	3.35	10.883

Source: *Own calculations.*

The Bounds test established that there is cointegration; hence there was a need to run the ARDL and error correction model with matrix list e(lags) as the criterion for the lag order. The hypothesis test was conducted at the 95 percent confidence level with a focus on the long-run model. As highlighted in Table 7, the model indicated that 93.69% of the variations in agricultural growth in Kenya is contributed by trade openness, tariffs and foreign direct investments as evidenced by R^2 = 0. 9369. The adjustment term shows that the errors of the prior model are rectified in the present period.

4.1 Test of Hypotheses (Long-run model)

H_{o1}: Trade openness has a significant influence on agricultural growth in Kenya

Trade openness positively influenced agricultural growth in Kenya (beta = 0.114, $\rho<0.05$). It can also be observed that the calculated t (2.510) is higher than the critical t (1.96). It means that the alternative hypothesis was accepted. The implication increase is that there is up to 0.114-unit increase in agricultural growth in Kenya for each unit in trade openness (see Table 7). The findings are in tally with that of Hye and Jafri, (2011) which established that trade openness contributed to agricultural growth in Pakistan. Besides, the above notion is consistent with the proposition of the firm heterogeneity model, whereby trade liberalization in

agriculture enables productive firms to expand their sales to global markets (Bernard *et al.*, 2003). There is, therefore, a possibility that open trade in Kenya, especially in agriculture, would increase the capacity of domestic farmers to the extent of exporting products in international markets.

However, the study findings are contrary to that of Darmawan, (2014), which established that openness to trade led to a decline in the production levels in Indonesian agriculture. Similar to the study, the error correction model was used to test cointegration. There was, however, no delineation of time to indicate post and pre-liberalization trade periods in Indonesia. The findings suggested that in the long-term, freer trade is deterrent to the growth in agriculture. The reason for this was that when Indonesia opened its borders to other trading partners, there was an increase in agricultural imports in the country.

H_{o2}: Tariffs have a significant influence on agricultural growth in Kenya

Findings in Table 7 indicated that the effect of tariffs on agricultural growth was not significant (beta = 0.000, $\rho>0.05$). This was confirmed by the calculated t (0.000), which was lower than the critical t (1.96). Therefore, the alternative hypothesis of a significant influence of tariffs on agricultural growth is rejected. As such, an increase or decrease in the tariff rate would have no influence on agricultural growth. In conformity with the results, Joramo, (2016) study on the effect of tariffs on Norwegian agricultural imports established that there is no link between tariff rate and agricultural growth in Norway.

However, the findings are in contrast with the firm heterogeneity model. The model argues that the liberalization of trade would enable producers in the domestic market to expand to cater to global markets. The results, however, suggest that an increase or decrease in tariffs does not influence agricultural growth. As such, there is need for further enquiry on the same since either a decline or increase in tariffs would have far-reaching implications on global trade in agriculture.

H_{o3}: Foreign direct investments have a significant influence on agricultural growth in Kenya

Research findings in Table 7 showed that FDI had a negative and significant effect on agricultural growth in Kenya (beta = -1.931, $\rho<0.05$). Also, the calculated t (3.200) is higher than the critical t (1.96). The implication is that the hypothesis of a significant association between FDI and agricultural growth in Kenya is accepted. The implication is that there is a 1.931-unit decline in agricultural growth in Kenya for a unit increase in net inflows of investment. There is a likelihood that the government may have promoted loose frameworks because of the inherent loopholes they can exploit to redirect funds into other programs. Specifically, foreign direct investment is directed to other sectors of the economy as opposed to agriculture. In conformity with the firm heterogeneity model, foreign direct investments tend to focus on high potential sectors of the economy. The implication is that there is limited focus on agriculture, thereby leading to its declined growth.

In line with the findings, Galiani and Porto, (2010) posited that despite Argentina liberalizing its trade for the past 60 years, there was limited economic growth. Specifically, the agricultural sector elicited dismal performance despite the nation having a competitive edge in the sector. The authors espoused that the FDI inflows were channelled into manufacturing with limited focus on agriculture. Past studies such as that of Njoki and Sahal, (2016) indicated that FDI had no impact on agriculture which is contrary to the study findings.

4.2 Short-Run Model

In the short -run the first lag (β= 1.349, t = 4.040, ρ<0.05), second lag (β= 0.948, t = 3.680, ρ<0.05) and third lag (β= 0.668, t= 4.550, ρ<0.05) of real GDP in agriculture positively influenced growth in agriculture. It can also be observed that the calculated t-values of the lags of real GDP in agriculture are higher than the critical t (1.96) meaning that its lag significantly influences real GDP in agriculture. Furthermore, the first lag of trade openness negatively influenced agricultural growth basing on β_1 = -0.321 (p-value = 0.005 which is less than α = 0.05). As well, the calculated t (3.400) is higher than the critical t (1.96). Therefore, the decline in agricultural growth in Kenya is brought about by the lag of trade openness. The results are in agreement with that of Bernard (2014), which explored the consequences of higher trade openness on the agricultural sector. The study concluded that in the short-run, trade openness was counterproductive to the growth in agriculture. The implication was that freeing up trade was deleterious to agricultural growth in the short -run.

As well, the first lag (β= 4.797, t = 2.780, ρ<0.05) and fourth lag of FDI (β= 2.019, t = 2.530, ρ<0.05) positively influenced growth in agriculture. Besides, the calculated t-values of the lags of FDI are higher than the critical t (1.96). Therefore, for each unit increase in the first lag of FDI, there is 4.797-unit increase in agricultural growth in Kenya. The same applies to the fourth lag of FDI whereby with a unit increase of the fourth lag, there would be a subsequent increase in agricultural growth by 2.019 units. The positive influence evidenced between FDI and agriculture in the short term conform with the findings by Oloyede, (2014) which indicated that agricultural productivity was brought about by a rise in both domestic financing and investments from foreigners. Palpably, the opening up of agricultural trade made it possible for the sector to benefit optimally from the inflows of investment from foreigners.

5. Conclusion and Recommendations

Trade openness is key to enhancing agricultural growth in Kenya. As Kenya opens its borders for easy movement of agricultural produce, there is a resultant increase in outputs for the domestic and foreign markets leading to an overall increase in agricultural growth. Moreover, trade openness offers more opportunities for farmers in terms of diversifying their agricultural produce which in turn increases their income.

Table 7. *Error Correction Representation of ARDL Model*

ARDL (4,1,4,0,4,2) regression						
Sample: 1984 – 2017	Number of obs	=	34			
	R-squared	=	0.9369			
	Adj R-squared	=	0.8399			
Log likelihood = -59.213	Root MSE	=	2.2329			
D.RGDP	**Coef.**	**Std.E**	**t**	**P>t**	**[95%]**	**Interva**
Adjust coeff						
Real GDP Agriculture						
1st lag of Real GDP Agriculture	-2.618	0.389	-6.730	0.00	-3.458	-1.778
Long Run						
Trade Openness	0.114	0.045	2.510	0.026	0.016	0.212
Foreign Direct Investment	-1.931	0.604	-3.200	0.007	-3.236	-0.626
Tariff	0.000	0.043	0.000	0.996	-0.093	0.094
Short R						
Real GDP Agriculture						
1st lag of Real GDP Agriculture	1.349	0.334	4.040	0.001	0.627	2.071
2nd lag of Real GDP Agriculture	0.948	0.257	3.680	0.003	0.392	1.503
3rd lag of Real GDP Agriculture	0.668	0.147	4.550	0.001	0.351	0.985
Trade Openness						
1st lag of Trade Openness	-0.321	0.094	-3.400	0.005	-0.526	-0.117
Foreign Direct Investment						
1st lag of foreign direct investment	4.797	1.725	2.780	0.016	1.070	8.524
2nd lag foreign direct investment	2.595	1.381	1.880	0.083	-0.388	5.578
3rd lag foreign direct investment	0.327	0.935	0.350	0.732	-1.692	2.346
4th lag foreign direct investment	2.019	0.799	2.530	0.025	0.292	3.746
_cons	-23.001	13.169	-1.750	0.104	-51.450	5.448

Source: *Own calculations.*

Therefore, there is a need for stringent implementation of liberalized agricultural trade. Moreover, since domestic producers will be facing competition from foreign producers, it is utmost necessary for the Kenyan government to provide financial aids and inputs to domestic producers so that they have a level playing field in the global agricultural trade.

Furthermore, FDI is responsible for the decline in agricultural growth in Kenya. There is a possibility that FDI contribution to agricultural growth is relatively low compared to the inflows in sectors such as manufacturing and service. There is thus need for the Ministry of Agriculture to create a conducive environment for

investment in Agriculture and link up domestic farmers and investors to boost the production levels in agriculture.

Finally, the influence of tariffs on agricultural growth was not significant. It could be because, despite Kenya making commitments to liberalize its trade, the implementation of the policies on free trade was not forthcoming, especially in the 1980s. Besides, the tariff rates were imposed on specific goods while for other goods, there were import controls; hence tariff rates could not sufficiently influence agricultural growth. It would, therefore, be plausible for future scholars to establish if the effects of tariff rates on agricultural growth appear in the periods before the liberalization of trade in Kenya.

6. Suggestions

The study has sufficiently highlighted the contribution of trade liberalization to agricultural growth. However, there are a wide array of research areas that emerge from the findings of the study. First, there is a need to extend the study period to include both the pre- and post-liberalization period while conducting the ARDL Bounds test of cointegration. Secondly, future research focusing on trade liberalization could incorporate the use of other measures of trade openness such as trade distortion indices and tariffs on imports to assess how trade openness influences agricultural growth in the East African region. Finally, future scholars could explore the effect of non-tariff barriers on agricultural growth in Kenya.

References:

Ahn, J., Khandelwal, A.K., Wei, S.J. 2011. The role of intermediaries in facilitating trade. Journal of International Economics, 84(1), 73-85.

Andersen, L., Babula, R. 2009. The link between openness and long-run economic growth. J. Int'l Com. & Econ., 2, 31.

Azarnert, L.V. 2014. Agricultural exports, tariffs and growth. Open Economies Review, 25(4), 797-807.

Baldwin, R., Evenett, S. 2009. The collapse of global trade, murky protectionism and the crisis: Recommendations for the G-20. Cepr.

Bernard, O.M. 2014. An Auto regressive Distributive Lag approach to Co integration: An examination of Trade Openness and Economic Growth Relationship in Nigeria. Research Journal of Economics and Business Studies, 3(3), 85-91.

Bernard, A.B., Eaton, J., Jensen, J.B., Kortum, S. 2003. Plants and productivity in international trade. American economic review, 93(4), 1268-1290.

Blake, A., McKay, A., Morrissey, O. 2002. The impact on Uganda of agricultural trade liberalization. Journal of agricultural Economics, 53(2), 365-381.

Chang, K.I., Hayakawa, K., Matsuura, T. 2014. Location choice of multinational enterprises in China: Comparison between Japan and Taiwan. Papers in Regional Science, 93(3), 521-537.

Cruces, G., Porto, G., Viollaz, M. 2018. Trade liberalization and informality in Argentina: exploring the adjustment mechanisms. Latin American Economic Review, 27(1), 13.

Darmawan, A. 2014. The Impact of Trade Liberalization on Agriculture in Indonesia.

De Silva, N., Malaga, J., Johnson, J. 2013. Trade liberalization effects on agricultural production growth: the case of Sri Lanka. In Southern Agricultural Economics Association Annual (SAEA) Meeting, Orlando, Florida, 2-5.

Fosu, O.A.E., Magnus, F.J. 2006. Bounds Testing Approach to Cointegration: An Examination of Foreign Direct Investment Trade and Growth Relationships. American Journal of Applied Sciences, 3(11), 2079-2085.

Golpinath, M., Sheldon, I., Echeverria, R. 2007. Firm heterogeneity and international trade: Implications for agricultural and food industries. IATRC Trade Policy Issues Paper, 5.

Gulzar, A. 2016. Does Trade Openness has Noteworthy effect on Bilateral Trade Flows of ECO Countries: An Empirical Investigation. Timisoara Journal of Economics and Business, 9(2), 95-114.

Hair, J.F.Jr., Black, W.C., Babin, B.J., Anderson, R.E. 2010. Multivariate Data Analysis: A Global Perspective (7th Ed.). Upper Saddle River, NJ: Pearson.

Hye, Q.M.A., Jafri, Z. 2011. Trade, human capital and agricultural sector growth of Pakistan economy. African Journal of Agricultural Research, 6(27), 5999-6007.

Joramo, O.M.S. 2016. The Effect of Tariffs on Import (Master's thesis).

Kemboi, M. 2020. Agricultural Trade Liberalization in Kenya and Implications for Kenya China Trade Relations. Developing Country Studies. doi: 10.7176/dcs/10-1-07.

Lee, E. 2005. Trade liberalization and employment. UN.

Liargovas, P.G., Skandalis, K.S. 2012. Foreign direct investment and trade openness: The case of developing economies. Social indicators research, 106(2), 323-331.

Melitz, M.J. 2003. The impact of trade on intra-industry reallocations and aggregate industry productivity. Econometrica, 71(6), 1695-1725.

Njoki, R.R., Sahal, M.A. 2016. The Effect of Foreign Direct Investment on Long Term Growth in Kenya Services and Agricultural Economic Sectors (Doctoral dissertation, School of Economics, University of Nairobi).

Nuetah, J.A. 2018. Global Agricultural Trade Liberalization and its Implications for Sub-Saharan Africa.

Oloyede, B. 2014. Impact of Foreign Direct Investment on Agricultural Sector Development in Nigeria (1981-2012). Kuwait Chapter of Arabian Journal of Business and Management Review, 3(12), 14-24.

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

Umboh, S.J.K., Hakim, D.B., Sinaga, B.M., Kariyasa, K. 2014. Impact of maize import tariff policy changes on production and consumption in Indonesia: A multimarket model analysis. International Journal of Food and Agricultural Economics (IJFAEC), 2(1128-2016-92038), 113.

World Trade Organization (WTO). 2015. Report on G-20 Trade Measures, 30 October.