

Unleashing the Potential of Food Systems to Enhance Intra-African Agric. Trade

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The Performance and Determinants of Rice Export in Tanzania: A Vector Error Correction Analysis

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Abstract

The performance of rice export in Tanzania is inadequate despite the country being the leading rice producer in the East African Community (EAC) region. Extensive government interventions in the sector and existence of inward-looking trade policies such as Common External Tariff within EAC region were expected to increase rice exports especially intra-regional trade. The question is why the country is performing poorly in terms of rice exports despite all the efforts and the favourable environment for rice production. To answer this question, the present paper analyses the determinants of rice exports in Tanzania. Specifically, it focuses on examining the influence of price and non-price factors on rice export and assessing the competitiveness of Tanzanian exported rice. The paper uses secondary data collected from government institutions and other international data repositories. Vector Error Correction Model was used to capture the dynamics of rice export in Tanzania while the competitiveness of rice exported is assessed using Revealed Comparative Advantage Model. Results show that, international rice price, quantity produced and average GDP per capita of Kenya, Rwanda, Uganda and Burundi are the key determinants for rice export performance in the country. Rice exported is found to be less competitive within EAC regional market. The paper recommends that the government should increase production to improve rice export performance and achieve competitiveness. This will help to meet the export demand of rice to the neighbouring countries and EAC region

Key words: Export performance, competitiveness, supply function, Tanzania, vector error correction model

1. Introduction

Rice is a staple food for more than half of the world's population with a vital role in the diets of billions of low-income and food insecure consumers (Zibae, 2013). It provides about 20% of the calories and consumed by 31% of the population of low income countries (Irshad *et al.*, 2018). In East Africa, Tanzania is the leading rice producer with average annual production of 2.9 Million MT in 2017 (FAOSTAT, 2019). Rice export demand within EAC region and to the neighbouring countries of Malawi, Democratic Republic of Congo, South Sudan and Zambia is rising in faster rate compared to production (RCT, 2018). Rice production in Tanzania increased from 2.2 Million MT in 2013 to 2.9 Million MT in 2017. Export demand to the neighbouring countries was approximately 51.8 Million MT in 2017 however rice export to the neighbouring countries was only 620 000 MT equivalent to 0.012% of total export demand within EAC region (FAOSTAT, 2019).

Within EAC region there are favorable trade policies such as Common External Tariff (CET) of 75% charged on rice imported to EAC region from non-member countries. Bandhu (2014) reported that, the performance of agricultural export depends not only on adequate surplus, international price, quality of product and comparative advantage of producing the exportable commodities but also on domestic and international trade policies. CET is intended to protect domestic producers within EAC thus providing a room for rice producers within EAC to produce sufficient rice to meet high export demand of rice in the international market (Ayoki, 2012; RCT, 2015). Despite the favourable trade policies on rice in EAC region that were expected to trigger domestic

production and intra-regional trade, performance of rice export in Tanzania to the neighbouring countries is still inadequate. Moreover, even though there is high rice production potential in the country enough to achieve a significant impact on rice export, still rice export is stumpy compared to export demand (Sage-el *et al.*, 2018).

Tanzania export share to the neighbouring countries is Kenya (35%), Rwanda (29%), Uganda (13%), South Sudan (6%), DRC (3.2%), Burundi (9%), Zambia (2.8%) and Malawi (2%) (FAOSTAT, 2019). This reveals the existence of high export demand to the neighbouring countries. Furthermore, rice export supply in Tanzania is still low with the great proportion of the exported rice being from large scale farmers (Barreiro, 2012 and FAO, 2015). Rice export share of Tanzania to the neighbouring countries is further illustrated in Figure 1.

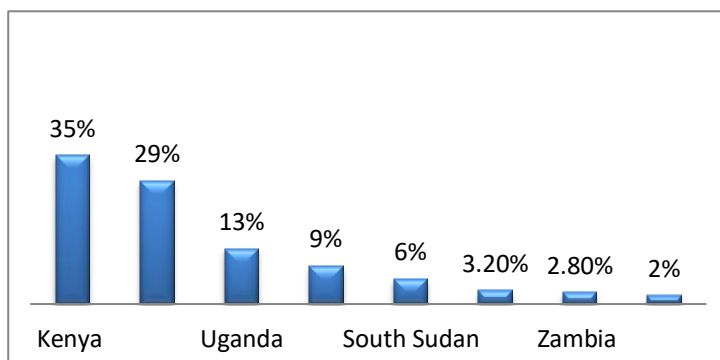


Figure 1: Tanzania export share of rice to the neighbouring countries

Source: FAOSTAT, 2019

Tanzania rice is highly demanded and it fetches good export price within EAC region and to the neighbouring countries due to its uniqueness in terms of aroma, grain size, taste, colour and cooking attributes (Mtaki, 2017). Despite the

existence of strong consumer demand of Tanzania rice to the neighbouring countries, favourable trade policies within EAC region and increasing trend of rice production, Tanzania has not been able to meet the prevailing high export demand of rice.

Competitiveness of rice exported from Tanzania depends on the fluctuations in international and domestic prices, production costs together with changes on demand and supply of rice in international markets (Kikuchi, 2016). International trade increases international competition and exposure to volatility in international prices. Tanzania is believed to have a competitive advantage in rice production and exports because of favourable production environment in the country, irrigation schemes, improved rice varieties such as NERICA and SARO 5 together with diverse agro-climatic conditions (Mwakasendo *et al.*, 2016). An assessment of export competitiveness of Tanzanian rice is required so as to ascertain the perceived competitiveness of Tanzanian rice in the neighbouring and international markets.

The government of Tanzania through National Rice Development Strategy (NRDS) of 2018 has placed much attention on rice as a strategic commodity so as to ensure food security and reducing poverty in the country (URT, 2018). Some strategies that have been implemented by the government include; improving irrigation facilities, provision of agricultural training, credit facilities and fertilizer distribution (EUCORD, 2012; Lewis and Wilson, 2015). Other strategies includes; improving research and development on rice as well as developing marketing infrastructure such as transport and storage facilities (Sage-el, 2018). Moreover, one of the favourable policy include policy framework of NRDS of

2018 which aims to achieve self-sufficiency in rice production and to substantially raise the competitiveness of Tanzania rice in regional markets. However, rice export performance in Tanzania is still inadequate. This study was therefore conducted in order to find out reasons for rice export instabilities and inadequacy of rice export performance in Tanzania. This paper will contribute to the body of knowledge by identifying the factors for poor performance of rice export in Tanzania using Vector Error Correction Model approach.

Understanding the magnitude and causes of instability of rice exports in Tanzania is important as it is required in devising strategies to efficiently exploit high rice production potential and sustain rice exports in the country. Understanding the factors that cause instability of rice supply to export market in Tanzania could help in appropriate policy formulations and implementations so as to increase rice exports thus effectively utilizing the available opportunities for trade within EAC and to the world at large. This will also improve the performance of rice export in the country so as to meet high export demand to the neighbouring countries, increase foreign earnings, income of rice traders and farming households, increase rice exports in Tanzania thus alleviating poverty in Tanzania and increase the possibility for Tanzania to become a significant rice exporting country worldwide.

2. Conceptual Framework

The conceptual framework in Figure 2 illustrates the interrelationships of variables in this paper. Based on the findings of empirical review, the performance and determinants of rice export in Tanzania is a function of institutional factors, price factors, non-price factors,

production and trade policies in the country. Production and trade policies affect rice export through different channels. Production and trade policies of Tanzania could impact on the competitiveness of rice export by affecting positively or negatively the production costs. The production and trade policies could affect the non-price factors, institutional factors and price factors hence affect the volume of rice export. Therefore, quantity of rice supplied to the export markets is a function of price factors, non-price factors, institutional factors, production and trade policies, domestic production as well as the competitiveness of Tanzanian rice export.

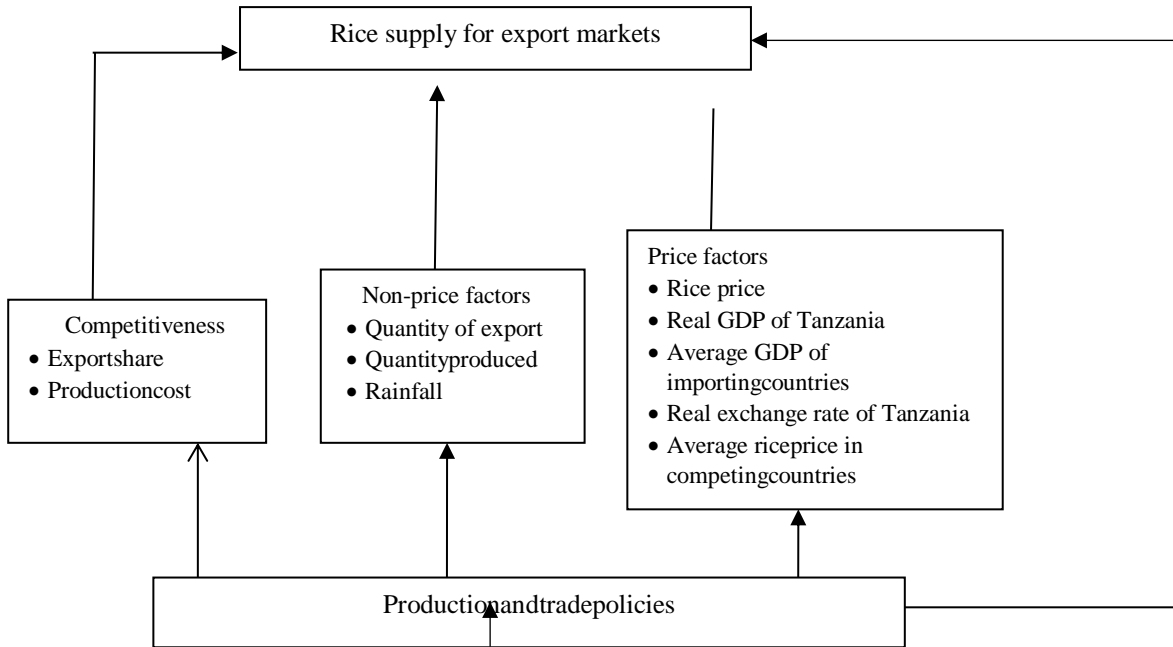


Figure 2: Conceptual framework

Source: Own conceptualization based on literature review

3. Methodology

3.1 Data Sources and Description of Variables

The paper uses time series secondary data collected from government institutions which are National Bureau of Statistics (NBS) and ministry of agriculture, food security department. These data sources were supplemented by other international sources specifically FAOSTAT, World Integrated Trade Solution (WITS) and International Trade Center (ITC).

Table 1: Data Sources and description of the variables

S/N	Data source	Variable/data	Description	Measurement
1.	NBS	Quantity produced	Quantity of rice produced domestically	Tonnes
		Rice price	Price of rice in Tanzania	US\$
2.	BOT	Real GDP(Gross Domestic Product)	Tanzania's GDP measured at constant factor cost of 2010	US\$
3.	FAOSTAT	Rainfall	Annual rainfall	MM
		Average price in competing countries	Average international rice price in competing countries such as Thailand, Vietnam, China and India	US\$
		Average GDP of importing countries	Average GDP of importing countries such as Kenya, Uganda, Burundi and Rwanda	US\$
4.	ITC	Exchange rate	Real exchange rate	US\$
5.	WITS	Export value(USD)	Export value of rice exported in Tanzania and rice competing countries	US\$

3.2 Analytical Framework

3.2.1 Rice export supply function estimation and specification

The secondary data regarding quantity produced, rice export quantity, rice price, Real GDP, rainfall, average international price, real exchange rate and average GDP of importing countries were used in this paper particularly for rice export supply function estimation. To have best statistical implications, annual time series data from 1970 to 2018 were analysed using STATA software through the model shown in equation 1 which has been adopted from Haleem (2005). The factors affecting rice export performance in Tanzania were identified using log linear type of supply function as used by Boansi (2013) and Mwinuka and Mlay, (2015). The estimated supply function was presented is as described in equation 1:

$$\ln Qe_t^s = \beta_0 + \beta_1 \ln AvGDP \text{ per capita}_{t-1} + \beta_2 \ln RRiceprice_{t-1} + \beta_3 \ln REXch_{t-1} + \beta_4 \ln RGDP_{t-1} + \beta_5 \ln REXR_{t-1} + \beta_6 \ln Rain_{t-1} + \beta_7 \ln ACPRICE_{t-1} + U_{t-1} \dots \dots \dots (1)$$

Where:

- Where; $\ln Q_t^s$ = natural log of quantity of rice exported
- $\ln AvGDP \text{ per capita}_{t-1}$ = natural log of real Average GDP per capita of the importing countries of rice from Tanzania
- $\ln ACPRICE_{t-1}$ = natural log of average rice price in competing countries at time t-1 in international market
- $\ln Price_{t-1}$ = natural log of rice price at time t-1
- $\ln RGDP_{t-1}$ = natural log of Real Gross Domestic Product in Tanzania at time t-1
- $\ln REXR_{t-1}$ = natural log of Real Exchange Rate in period t-1

$\ln RAINF_{t-1}$ = natural log of rainfall in periodt-1

$\ln QP_{t-1}$ = natural log of quantity of rice produced in the country in periodt-1

U_t = other unknown factors that affecting rice supply to export markets at time t-1.

3.2.2 Vector Error Correction Model (VECM) estimation and specification

Rice export supply function was estimated using Vector Error Correction Model. The supply function estimated by Vector Error Correction Model was used to determine how rice export in Tanzania responds to changes in price and non-price factors. Vector Error Correction Model was used for analysis using statistical software E-views

Vector Error Correction Model is defined as a restricted Vector Auto Regression (VAR) model designed for the use of stationary data that are known to be co-integrated. Vector Error Correction Model displays both short run and long run dynamics of the VECM is presented as follows:

$$\Delta Y_t = \theta + \sum_{i=1}^{k-1} Y_i \Delta Y_{t-i} + \sum_{j=1}^{k-1} n_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \theta \varepsilon_m \Delta R_{t-m} + \lambda ECT_{t-1} + \mu_t \dots \dots (2)$$

Where; ΔY_t =Is the dependent variable in the model

ECT_{t-1} =Error Correction Term which explains the previous year's deviation from long run equilibrium, k-1=Lag length

λ =Measures the speed of adjustment at which the dependent variable Y returns to the equilibrium after changes in the independent variables

For rice supply function in this study, the specified Vector Error Correction Model is as follows:

Where: ECT_{t-1} =Co-integrating equation in the long run model

$$ECT_{t-1} = Y_{t-1} - n_j X_{t-1} - \varepsilon_i R_{t-1} \dots \dots \dots (3)$$

ECT_{t-1} Explains the previous year's deviation from the long run equilibrium in the sense that, last period deviation from the long run equilibrium influences the short run dynamics of the dependent variable (Y_t). The coefficient of the ECT (λ) measures the speed of adjustment, it measures the speed at which the dependent variable (Y_t) returns to the equilibrium after changes in the independent variables in the model. Δ =represents the difference operator, μ_t =Is the disturbance term.

3.2.2.1 Expectation and justification of the variables in vector error correction model

Rice price

As stipulated by the theory, the higher the price, the higher the quantity supplied (*ceteris paribus*). Rice price is expected to have positive relationship with rice export. As rice price increases in Tanzania, rice production domestically will also increase due to the fact that rice producers will increase the amount of rice to be produced. Other farmers will shift from growing other crops and start cultivating rice thus there will be surplus produced hence increase of rice supply to the export markets.

Gross Domestic Product of Tanzania

We expect a positive relationship between quantity of rice exported and Gross Domestic Product of Tanzania. The higher the GDP of the country, the better the performance of the country's economy. This will increase government

intervention to the rice sub-sector hence increase production and rice export in Tanzania production will increase hence causing the increase of rice supply to the export markets.

Quantity produced

Quantity produced reveals the volumes of production that is supplied to the export markets at given international rice price. Domestic rice production is expected to have a positive relationship with rice supply to export markets due to the fact that as rice production increases there will be sufficient rice and surplus rice to be exported (*ceteris paribus*).

Exchange rate

When exchange rate of Tanzanian currency with dollar increase, then rice exports also is expected to increase (*ceteris paribus*). Devaluation of domestic currency makes the exports cheaper. Thus a positive impact of exchange rate is expected on rice export from Tanzania due to the fact that higher exchange rate due to depreciation of domestic currency leads to the decrease of rice prices abroad in turn leads to increase of rice exports; also devaluation increase competitiveness of Tanzanian rice exported hence higher exports.

Average GDP per capita of importing countries

Tanzania is well known to export rice to the neighbouring countries. Countries importing Tanzanian rice includes; Rwanda, Burundi, Kenya, Uganda, United Republic of Congo and South Sudan. Average GDP per capita of importing countries shows the purchasing power of these countries. The higher the average GDP per capita of importing countries (*ceteris paribus*), the higher the purchasing power thus increases rice to be purchased from Tanzania. Average GDP

per capita of importing countries of rice from Tanzania is expected to have positive influence to the increase of rice export in Tanzania.

Average international price

Average international price of rice is the price of rice in international markets especially to the countries who are the major competitors of Tanzania in export market and it is quoted in US\$. These countries include the Asian countries such as Thailand, Pakistan, Vietnam, China, India and Bangladesh. If rice price to competitors of Tanzania increases, importers will be attracted to buy Tanzanian rice because of competitive advantage. So, a positive impact of international price is expected on increase of rice exports from Tanzania.

Rainfall

We expect positive influence of rainfall on rice export in Tanzania. As rainfall increase, particular the farmers in Tanzania who relies on rainfall to perform rice farming activities, quantity of rice cultivated will increase hence increase of rice export (*ceteris paribus*). Sufficient rainfall stimulates production due to availability of sufficient water for rice crops during farming activities therefore results to the production of surplus of rice to be exported hence increase rice supply to the export market.

Table 2: Expected signs of the parameters to be estimated by VECM

S/N	Variable	Description	Expected sign
1.	Average GDP per capita	Average GPD per capita of importing countries of rice from Tanzania	Positive (+)
3.	Rice price	Rice price	Positive (+)
4.	Average international price	Average rice price in major competitors of Tanzania in international market	Positive (+)
5.	Real GDP	GPD of Tanzania	Positive (+)
	Quantity produced	Quantity of rice produced in Tanzania	Positive (+)
6.	Exchange rate		Positive (+)
7.	Rainfall	Annual rainfall measured in mm	Positive (+)

3.2.3 Revealed comparative advantage

The competitiveness of rice supplied to export markets was assessed by the use of Revealed Comparative Advantage to estimate the Relative Trade Advantage (RTA) of Tanzania in rice export. The model is based on the economic theory of comparative advantage. The model is a theoretically-consistent measure of competitiveness as used by Ukwadu (2015).

$$RTA = RXA - RMA \dots \dots \dots (4)$$

RXA=Relative Export Advantage, RMA=Relative Import Advantage

$$RXA_{ij} = \frac{X_{ij}}{X_t} / \frac{X_{jw}}{X_{wt}} \dots \dots \dots (5)$$

RXA_{ij}=Relative Export Advantage of country i in exporting commodity j

X_{ij} =is the country's export of commodity j, X_t =is the country's total exports

X_{jw} = is the world's export of commodity j, X_{wt} =is the total world exports

This paper is based on the main importers of Tanzanian rice which include Kenya, Rwanda, Uganda and Burundi that are within EAC and other neighbouring countries which are South Sudan and Democratic Republic of Congo. Competitiveness of Tanzanian rice exported is assessed relative to the competing countries in the world which are countries that also exports rice. These countries includes; India, Pakistan, Vietnam, Thailand, Bangladesh, Philippines and China. Therefore, RXA_T is used to assess the competitiveness of Tanzanian rice exported relative to the competing countries in the world by comparing the rice export share of Tanzania relative to the rice export share of the competing countries in the international market. The formula for assessing competitiveness is given as follows;

$$RXA_T = \left(\frac{Xr_T}{Xe_T}\right) / \left(\frac{Xr_{EAC}}{Xe_{EAC}}\right) \dots\dots\dots (6)$$

Where; Xr_T = Tanzania rice exports to the neighbouring countries, Xe_T = Tanzania total exports to the neighbouring countries, Xr_{EAC} = Rice export of competing countries to EAC block, Congo and South Sudan, Xe_{EAC} = Total exports of the competing countries to EAC block, Congo and Sudan. If RXA is greater than one ($RXA > 1$) means that Tanzanian rice exported is competitive in international markets compared to other competing countries while if RXA is less than one ($RXA < 1$), this means that Tanzania is less competitive in exporting rice relative to the competing countries.

4. Results and Discussions

4.1 Model Adequacy Test

4.1.1 Unit root test

Unit root test was performed using Argumented Dickey Fuller test so as to ensure that all variables are stationary. The results of the tests show that rice price, real exchange rate and quantity of rice exported are non-stationary at the level as the Argumented Dickey Fuller test values were less than the critical values. This implies that these variables need to be tested at the first difference. All variables they were all found to be stationary after the first difference implying that they follow I(1) series. Since all variables are stationary at I(1), therefore Vector Error Correction Model was employed for analysis.

4.1.2 Lag Length Selection Criteria

Before estimating a time series equation, it is important to decide on the maximum number of lags (Gujarati, 2004). The rule of thumb is to select the criteria with lowest lag length because the lower the number, the better the model. Therefore we choose the lag length for which the values of most of these lag length criteria is minimal (Gutierrez *et al.*, 2009). The optimal lag length is 2 and the best selection criteria to adopt for the model is Schwarz information criterion.

4.1.3 Johansen Co-integration Test

The Johansen approach was used to test for co-integration and it was found that the Maximum Eigen value test verifies the evidence of one co-integrating equation. Based on the results

obtained, the null hypothesis of no co-integration ($H_0: r = 0$) is rejected at $p < 0.05$ because the computed Maximum Eigenvalue test (127.06) is higher than the critical value (52.36). Green (2006) points out that, before running a VECM, the variables should be co-integrated at the same level. This is the necessary condition before running the VECM.

4.2 The Influence of Price and Non-price Factors on Rice Export Performance in Tanzania

The short run estimates of the variables estimated by the Vector Error Correction Model show that rice price, international price and quantity produced have statistically significant influence on the performance of rice export in Tanzania.

As stipulated in theory, own price elasticity of rice is positive showing a positive relationship between price of rice and quantity of rice exported. As expected, rice price has positive effect on rice export performance. In the short run, it is estimated that, if rice price increases by 1%, the mean rice export supply will increase by 6.0724%, holding other variables constant. These empirical results are in line with the theory that the higher the price, the higher the quantity of rice supplied (*ceteris paribus*). It is estimated that in the short run, if real exchange rate increases by 1%, the mean rice export will increase by 0.0078% holding all other variables constant. When the exchange rate for the Tanzanian shillings with dollars increase, exports become cheaper to the neighboring countries and hence increasing rice export. These results are in line with the study done by Jagdambe (2016) who found that, the adjustments of the exchange rate policy in India resulted to the decrease of Indian's price of rice compared to others in

international markets hence increasing competitiveness of Indian rice. The increase in competitiveness lead to the improvement of rice exportation. However, these results are contrary to the study done by Paltasingh and Goyari (2013) who determined the supply elasticity of agricultural produced crops in India using the Vector Error Correction Model (VECM). Their results revealed that rainfall found to be highly significant on increase of supply of agricultural produced than other factors.

As expected, international price of rice to the competing countries has a positive effect on the performance of rice export in Tanzania. In the short run it is estimated that, increase of international rice price to the competing countries by 1% results to the mean increase of rice export by 9.5828% holding other variables constant. When rice price to the competing countries such as India, Vietnam, Thailand and Pakistan increases, importers within EAC region and other neighbouring countries will be attracted to Tanzanian rice due to price competitiveness (holding other things constant). International rice price is highly significant with positive elasticity indicating that increase of rice price to the competing countries has a positive effect on the increase of rice exports in Tanzania. Increase of rice price to these competing countries prompts the importers to shift towards Tanzania rice due to price advantage hence increasing competitiveness of Tanzania rice in international markets. In the short run it is estimated that, 1% increase of quantity of rice produced in the country results to 0.4014% mean increase of rice supply to the export markets holding other things constant. Rice export is more influenced by the previous year's production, when more rice is produced in the previous year; more export is expected in the current year. Continuous higher rice production adds to

stock of rice, indicating that the government should take initiatives to increase production. As expected, increase of the GDP per capita of the importing countries indicates the increase of the purchasing power, holding other things constant; this will increase rice purchases by importing countries from Tanzania. In the short run, it is estimated that 1% increase of average GDP of the countries that imports rice from Tanzania results to 4.4589% mean increase of rice export holding other variables constant.

Contrary to the expectation, rice price has negative effect on rice export supply in the long run. It is estimated that if rice price increases by 1%, the mean rice export will decrease by 4.0036% holding all other variables constant. These results reveal that, increase of rice price in Tanzania, assuming price in the competing countries remain constant, decreases rice export in Tanzania as rice importers in the neighbouring countries will purchase rice from other competing countries. In the long run, it is estimated that, 1% increase of rice production results to mean increase of rice export by 5.1392% holding all other variables constant. These results confirm the theory that, increase in production results to the increase of quantity supplied, holding other factors constant. In the long run, it is estimated that 1% increase in the international price of rice to the competing countries results to the mean increase of rice export by 4.001% holding all other variables constant. This reveals that in the long run, increase of international rice price (assuming rice price in Tanzania remains constant), this will increase price competitiveness of Tanzanian rice to the neighboring countries thus increasing rice export. In the long run, it is estimated that if GDP of importing countries increase by 1%, mean rice export supply will increase by 1.089% holding all other variables constant.

Table 3. The factors that determines rice export in the short run and in the long run

Variable	Short run				Long run			
	Coefficient	Standard error	T-Statistics	P-Values	Coefficient	Standard error	T-Statistics	P-Values
Rice price	6.0724	2.5152	2.3742	0.0112**	-4.004	0.295	-3.117	0.001***
Real GDP	-0.1898	0.1924	0.9862	0.3304	-0.507	0.144	1.271	0.104
InternatPrice	9.5828	4.3644	2.1956	0.0024**	0.188	0.462	0.115	0.914
QuantityProd	0.4014	0.1404	-2.8760	0.0078**	5.139	0.943	-8.481	0.000***
RealExchang	0.0078	1.4514	4.9708	0.0054**	4.001	1.384	5.814	0.003***
AGDPofimp	4.4589	1.3478	3.1514	0.0019**	1.019	1.189	3.442	0.042**
AnnualRainf	0.4192	0.4347	0.9641	0.5102	-3.380	1.229	1.721	0.347
C	2.5917	0.2364	0.0598	0.1934	Trend	-8.567	1.3405	-1.325
R-squared	0.8437	F-statistic	9.864		C	0.943	0.0249	-0.0416
Adj. R-squared	0.5843	Prob(F-statistic)	0.0302					
		Durbin-Watson	1.5242					

* Indicates 90% confidence level, ** indicates 95% confidence level and *** indicates 99 level of confidence

An R-squared of 0.8437 indicates that, 84.3% of variation in rice supply for export markets can be explained by the variables in the model. With an F-Statistic probability of 0.0302 we can conclude that the Vector Error Correction model as a whole is statistically significant at 0.05 significance level

4.3 The Competitiveness of Tanzanian Rice Supplied to the Export Markets

The results of the analysis show that Relative Export Advantage XA (0.24) is less than one. This implies that Tanzania rice exported is less competitive within EAC region and to the neighboring countries compared to the rice exported from other rice growing countries such as Pakistan and India. This can be attributed to poor production and low usage of better-quality varieties by rice producers in Tanzania which results to poor quality of rice produced. Other reasons could be due to lack of membership of cooperative societies by rice traders which all these minimizes the bargaining power of rice traders in international markets and increase of production costs thus minimizes competitiveness of rice exported to the international markets (Ngailo, 2017). These findings are consistent with the study done by Sampaothon (2016) on factors affecting the performance of Thailand export market in Chinese using revealed comparative advantage which found that Thailand was less competitiveness in Chinese market compared to Vietnam due to high labor cost, high production cost, high transport cost and existing discouraging government policies towards export market. To sustain and increase rice exports, rice has to be competitive in the international market. The results are presented in Table 4.

Table 1: Estimate of Relative Export Advantage of Tanzania rice

Year	Export value of rice in Tanzania to the neighbouring countries (in '000 USD)	Total exports of Tanzania to EAC block, Congo and South Sudan (in '000 USD)	Total rice export value of competing countries to EAC block, Congo and South Sudan (in '000 USD)	Total exports of the competing countries to EAC block, Congo and Sudan (in '000 USD)
2018	1245	15 397.63	26 209.928	94 615.971
2017	1211	17 112.98	24 682.356	111 598.861
2016	2765	19 648.96	20 749.716	128 432.044
2015	1049	31 210.78	23 215.966	148 914.859
2014	1919.3	29 824.04	26 450.157	115 684.220
2013	2003	39 216.33	24 060.336	143 700.180
2012	5427	47 349.59	23 680.443	172 583.167
2011	1271.9	55 472.29	23 985.454	171 335.161
2010	1448	44 125.48	20 143.661	178 023.579
2009	216	57 046.53	19 306.929	176 541.492
2008	1648	58 542.30	20 236.398	152 750.954
2007	3974	47 419.24	13 748.857	148 554.885
2006	1410	41 781.09	10 593.462	165 678.258
2005	1734	36 692.12	9612.789	150 019.782
Total	27 321.2	809 439.37	286 675.963	2 058 433.413
Ratio of Tanzania rice export to Total exports of Tanzania	0.03375			
Ratio of total export competing countries to total exports of competing countries	0.13933			
Relative Export Advantage	0.24223			

The analysis of competitiveness showed that, Tanzanian rice found to be less competitive for their export compared to other competing countries in the international markets as evident from RXA which is less than 1. Apart from competitive pricing, other factors such as quality, honoring export commitments, regularity of supply play important role in

capturing international rice markets (Bhullar, 2005).

5. Conclusion and Recommendations

We have found that, rice price, real exchange rate, rice production and international rice price are the main determinants of rice export performance in Tanzania in the long run. Furthermore, in the short run it has been realized that quantity produced have positive implications on rice export performance in Tanzania. International price of rice in the competing countries has been found to be statistically significant on influencing rice export performance in Tanzania both in the long run and in the short run. This shows that, for Tanzania export to increase, the government policy should increase production so as to lower the domestic price thus grabbing export opportunities within EAC region and attracts more importers from neighbouring countries.

We have discovered that, rice exported from Tanzania is not competitive within EAC regional market and other neighbouring countries such as Zambia, Malawi and DRC. This implies that, there is a room for improvement of rice competitiveness so as to improve rice export performance in Tanzania. Moreover, to improve rice competitiveness in export markets, production should be improved by using improved rice varieties so as to attain surplus production and increase rice export share to the regional market hence achieving competitiveness to the regional market. Based on the findings it is plausible to recommend that, the government of Tanzania should improve market infrastructures and quality of rice produced hence improve rice export performance in Tanzania. Also the government stakeholders should keep much emphasis on cooperative societies membership by rice traders

so as to increase the bargaining power of rice traders in the regional market. Thus increase rice traders participation and export share to the regional market hence achieve competitiveness of rice exported

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