
Determinants of Export Performance of Tea in Tanzania: Parametric and Non Parametric Analysis

John Kingu
Mohanlal Sukhadia University, Udaipur, India

This paper investigates the determinants of export performance in tea using secondary data spanning from 1970 to 2012. The study utilizes parametric and non-parametric statistics to examine the determinants of export performance. Parametric analysis shows that all variables are non stationary at level and are stationary at first difference. Co integration test using Engle-Granger and Johansen test supported that all variables are co integrated means all variables have long run relationship. In long run coefficients, study reveal that world prices and production quantities are main determinants of tea export performance whereas real exchange rates and dummy variable are not significant. In short run, world prices remain significant determinant of tea export performance while other variables are not. Error correction term has negative sign (-0.721545) which signifies that all variables have long run relationship and adjusting at the speed of 72 percent per annum to correct the disequilibrium amongst the variables. Non parametric statistic test concurred with dummy variables results that trade liberalization has no significant changes in tea export performance. Therefore, tea export performance is mainly determined by internal and external factors as such Tanzanian government should earmark on those factors in order to improve the export performance in Tanzania.

Keywords – Agricultural cash crops, Determinants of Export Performance, Parametric and Non Parametric techniques and Trade Liberalization.

INTRODUCTION

Tanzania like many other developing countries depends more in exporting cash agricultural products to earn foreign currencies. Other agricultural cash crops exported from Tanzania are cashew nuts, cloves, pyrethrum, sisal, cotton, coffee, tobacco and sesames. However the productions of these agricultural cash crops remains a problem in agricultural sector in Tanzania before and even after liberalize the agricultural sector in mid 1980s as such affected the export performance of agricultural cash crops at large. In this regard, tea production and exports is very uncertain due to various reasons such as natural calamities and human factors like poor farming techniques. Production of tea in Tanzania mainly is done by smallholders and large estates owned by big companies. Smallholders they owned small plots which averaging less than a hectare whereas large estates owned by big companies normally estates exceeded 1000 hectares. Following poor performance in production and export of tea, Tanzanian government in the early 1980s embarked on privatization and rehabilitation of two tea estates. These two tea estates were nationalized in 1970s. In that effort the government restructured the tea Board and privatized six state tea factories. Those changes improved the production of tea and ultimately increased the export performance of tea (Bargawi, 2008). However, tea production was not insulated from the problems like droughts, inadequate infrastructure and economic crisis

experienced in late 1970s and 1980s as such export performance of tea was extremely affected. For instance, in 1985 smallholders produced 30 percent of the total tea output in Tanzania but in late 1980s smallholder's encountered serious problems in input provisions and marketing of tea following trade liberalization in 1986. As a result in 1995 its share to total tea output declined dramatic from 30 percent in 1985 to less than 10 percent in 1995 (Bargawi, 2008).

It is important to note that Tanzania's agricultural sector normally constitutes over fifty percent of national Gross Domestic Product (GDP) and brings substantial contributions to the country's export earnings in the economy at large (Bargawi, 2008). In order to make the agricultural sector more efficient, the Tanzanian government liberalized the trade in 1986. Contrary to the expectation, liberalization of agricultural sector was implemented gradually. For instance, many cash crops were liberalized in 1993/94 onwards and tea been among.

Despite the effort being taken by the government to liberalize the tea industry but much remains which constraining the prosperity of tea industry in Tanzania. Those problems include inadequate infrastructure, tax multiplicity that is tax structure is too complex as well as a lot of taxes in the same crop. Furthermore tax rate is still too high as such discouraged the farmers (small holders). Again, liberalization of agricultural sector was implemented without considering the supply chain management as such halted the production and quality of many agricultural cash crops. Ultimately liberalization process harmed the export performance in tea industry. Thus, those factors affected tea export performance significantly. Therefore, this study intends to examine the determinants of export performance of tea following the inception of trade liberalization in mid 1980s. This is done purposely in order to know the situations before and after liberalization. The results from this study will be of great importance to the government, policy makers and practitioners. For instance, if the policy makers get informed the main

determinants of Tanzanian tea export performance and put it in its policy implementations may improve economy at large. Or if Tanzanian government improves export performance after being aware of the determinants of tea export growth it will stimulate the economic growth, import and productivity growth, balance of payments and economic welfare as whole.

Trade Liberalization

Having an overview in tea production and export performance, it is imperative to understand the term trade liberalization. However, there no single definition/meaning of the term trade liberalization. But the most celebrates definition of trade liberalization was given Krueger and Bhagwati, 1978. They defined Trade liberalization as "any policy that reduces the degree of anti-export bias and this could be achieved through removal of all trade distortion including import tariff and export subsidies" (Krueger and Bhagwati, 1978 cited in Kazungu, 2009:15). On the other hand, other scholars defined trade liberalization as the reduction and gradual elimination of tariff and non tariff trade barriers which may obstruct the free flow of goods and service across national borders (Zulfiqar and Kausar, 2012:32). In addition, trade liberalization defined as the removal or reduction of trade barriers which prevent the smooth trade transactions of goods and services among trade partners. Trade barriers include tariff and non tariff. Non tariff includes duties, export subsidies, import quotas and import regulations like licensing regulations. Moreover, trade liberalization viewed as reduction of government incentives and trade restrictions between trading countries (World Bank 2001 cited in Allaro, 2012). In tandem with those definitions, trade liberalization in this study is considered as the tendency of Tanzanian government to relax trade restrictions to nearly free trade among trade partners. In order to ensure successful process of trade liberalization in Tanzania, government started to abandon export licenses and registration of export companies, means that companies were allowed to export their products freely, all this was done in

1993/94. In 1999 government again removed all forms of export restrictions. On the other hand, government also reduced the import tariff rate gradually since that side had economic implications. Reducing import tariffs means reducing the government revenue as such may harm the entire economy at large. For instance, in 1980 to 1986, import tariffs were 40 percent, but with imposition of trade liberalization, in 1986 import tariffs were reduced from 35 per cent to 23 percent in 1988 respectively. On top of that, in 1999 tariffs rate were reduced to between 20 and 15 percent. On the issues regarding import licensing were removed in 1993 (Kannan, 2000). Removing tariffs and non tariffs as well as import licensing were expected to improve export performance.

Export Performance

Export performance is defined as the success or failure of the efforts of a nation to export goods and services beyond national borders (Zou and stan, 1998 cited in Allaro 2010:4). Other things remains constant, trade liberalization tends to improve export performance of the liberalized country. In this regard, there some literatures which supported this notion. For instance, Rodrick, (1992), Jenkins 1997, Paulino 2003, Penélope 2005, Hadas et al. 2010 and Mold and Prizzno 2010 but to mention a few have supported notion that trade liberalization improved export performance of the countries under study. In the same vein, trade liberalization makes export sector of the liberalized country to be more outward oriented than inward looking (Ahmed 2000, Paulino, 2003 and Penélope, 2005). In this perspective, outward looking increases country's resource allocation from non productive sector to productive sector as such improves the exports of a particular country. Furthermore, empirical evidences pointed out that, trade among trade partners in recent years have increased tremendously as such improves the export performance of the liberalized countries significantly (Sloman, 2006, Samuelson and Nordhaus, 2010 and Sloman et al, 2010). Moreover, export performance is associated with the economies of scale to trade partners. Economies of scale

normally are attained when the trade partners acquire new mode of production line from trading activities as such cost of production tend to fall as more products are produced (Thrillwall, 2000). Other scholars contend that, export performance is made possible through access to new technology from trade partners as such export performance influences other sectors to grow as well. That influence known as positive spillover effect to other sectors (Santos-Paulino 2003 and Penelope, 2005). Positive spillover effects are attained in form of management skills and efficient allocation of resources of a particular sector. It is important to stress that, studies undertaken so far on the impact of trade liberalization on export performance on liberalized countries have revealed conflicting results. Some studies found positive relationship between trade liberalization and export performance whereas others find opposite results that is there are negative (weak) relation between trade liberalization and export performance in developing countries. Generally speaking, many studies have supported the theory that trade liberalization improves export performance of developing countries.

Determinants of export performance

In order to attain export led growth or export performance in any country, there are important variables which determine the export performance. These determinants of export performance are internal and external. It should be clear that these determinants are the ones which may boost or deter the export performance of a country. External determinants are the factors which are beyond the control of the country in trade. External factors include terms of trade, world income of trading partners and elasticity of demand of exported commodities. On the other hand, internal determinants are those factors which are internal oriented, means that are factors which internally generated such as domestic policies on trade like revaluation / appreciation or devaluation / depreciation of domestic currency against trading partners, infrastructures and taxation policies on

agricultural exports as well as credit policies on agricultural activities (Gbetnkom and Khan, 2002). Internal and external determinants now days have raised discussion among scholars whether those factors are determining the export performance or not.

Regarding internal and external determinants, currently there hot debate on the determinants of agricultural exports in many developing countries. Debate is centered on whether those determinants have improved the export sector of the liberalized countries or not. In ongoing debate, mainly there two school of thoughts which trying to explain the decline of many developing countries agricultural exports. The first school of thought asserted that, there factors which are external to the individual country such as deteriorating of terms of trade and world income of trade partners which are external determinants are not effective enough in supporting developing countries export sectors. On the other hand, second school of thought emphases that, the factors which are internal orientated are the one which deter the export growth of the developing countries like Tanzania, such factors are poor domestic policies on trade, poor infrastructures, poor crop husbandry, natural calamities such as droughts and floods, inadequate or lack of agricultural export credit and multiplicity of taxes on agricultural exports amongst others (Gbetnkom and Khan, 2002). It is from this line the study find it is imperative to undertake a study in agricultural products in Tanzania particularly in tea industry to examine its determinants of export performance from 1970 to 2012.

LITERATURE REVIEW

Empirical studies regarding determinants of export performance in developing countries in agricultural products have produced conflicting results. Studies found that in some developing countries internal determinants are vital factors in influencing export performance in agricultural products whereas in some developing countries external determinants are significant factors in determining the export

growth. Furthermore, other studies found that both internal and external determinants are vital factors in determining the export growth of liberalized countries. So far there no clear demarcations which underline the main determinants of export performance of agricultural products in developing countries. For instance, studies which found that internal determinants were significant determinant of export performance were studies conducted in Morocco, Algeria and Tunisia by Mouna and Reza (2001) and in Pakistan by Majeed and Ahmad (2006) whereas Agasha (2009) he found that both internal and external determinants were significant factors in promoting export growth in Uganda similar to Anwar et al (2010) where they found both internal and external determinants were significant factors in determining the export performance of cotton lint in Pakistan respectively. Contrary to the above results Kusi (2002) found that external determinants were main determinants of export performance in South Africa. However, Kusi's empirical results reflected manufacturing sector rather than agricultural sector. Furthermore, other studies supported that internal determinants were significant than external determinants in promoting export performance of agricultural products. Studies by Yeboah (2008) and Mesike et al (2008) pointed out that internal determinants were significant factors in promoting export performance of agricultural products in West African countries. In the same line, Abolagba et al (2010) examined the determinants of agricultural export in Nigeria particularly in cocoa and rubber and they found similar results as Yeboah and Mesike et al in 2008 that internal determinants were important factors which promoted export performance in cocoa and rubber in Nigeria. Concurrently Folawewo and Olakojo (2010) they examined the determinants of agricultural export in oil exporting economy. Their findings revealed that both internal and external determinants were significant determinants of export performance in oil exporting economy. In Ethiopia, internal determinants were significant factors in promoting export performance of oil seed. That was proved by Allaro (2010) who examined the export performance

of oil seed and its determinants in Ethiopia. Similar to Allaro (2010), Hatab et al (2010) they found similar results that internal determinants were vital determinants of Egyptian agricultural export in Egypt. It is important to note that, internal determinants found to be more powerful in determining agricultural products in developing countries than external factors. Apart from the above empirical evidences also Amoro and Shen (2012) supported that internal determinant in Cote d'Ivoire promoted substantially the export performance of cocoa and rubber. In the same vein, Kingu (2014) he examined the determinants of agricultural export in cotton lint in Tanzania and he found that cotton lint export growths were determined mostly by internal factors such as real exchange rate and agricultural productivity. However that study included only internal variables in its investigations. All in all based on the empirical results described above, internal determinants remain to be important determinants of agricultural products in developing countries. With these conflicting results and ongoing debate about the important determinates of export performance in developing countries which exports more of agricultural products, motivates this study to be taken in Tanzania particular in tea industry which is among of the major industry which export tea crop from Tanzania. Empirical results obtained in this study will add to the body of knowledge regarding the determinants of export performance of tea industry in Tanzania.

RESEARCH METHODOLOGY

This study follows parametric and non parametric tests so as to be able to measure the objective the study. The objective of the study is to examine the determinants of export performance in tea in Tanzania. Under this research objective parametric (econometrics) is suitable research method in investing the determinants of export growth as well as non parametric research method is appropriate since has the power to measure the effect of changes before and after trade liberalization. In this study model specifications under econometrics employ

single equation (multiple regression analysis) utilising tea secondary data spanning from 1970 to 2012. The regression equations are in natural logarithms so as to be able to reduce the problems of heteroscedasticity and outliers respectively. Modelling considered the demand conditions in importing countries as given similar to Ahmed (2000) as such Tanzania's demand is infinitely price elastic. With this regard we estimated a single equation of the determinants of export performance under supply function (approach) for tea. Export trade modelling in this study followed the imperfect substitute model similar to many scholars like Ahmed, (2000), Bashir, (2003), Penélope-López. (2004) Yusuph and edom (2007), Agasha, (2009), Allaro, (2010), Allaro, (2012) and Kingu, (2014) amongst others. Main assumption about imperfect substitute model is that neither export nor imports are perfect substitute for domestic products particularly agricultural products. The long run cash crops export supply function is specified as follows:

$$\text{Export values (X)} = F(\text{WP, Q, RER}) \quad (1)$$

Where X is tea export values, WP is world price, Q is production quantities and RER is real exchange rate and F is function of. Equation (1) is transformed into econometrics model so as capture the measurability of the variables also include the dummy and error terms. Dummy variable is included in the model to capture the distinction (if any) before and after trade liberalization periods from 1970 to 2012. Value of zero is given for the period before trade liberalization (1970 to 1985) and value of one is given for the period after trade liberalization from 1986 to 2012. In order to examine the determinants of export performance in tea the following econometrics modeling was formulated. All variables are instituted the natural logarithms except dummy variable.

$$\ln X_t = \alpha_0 + \alpha_1 \ln WP_t + \alpha_2 \ln Q_t + \alpha_3 \ln RER_t + \alpha_4 D_t + \varepsilon_t \quad (2)$$

The definition of variables remains the same as describes above except for D_t and ε_t . D_t is dummy variable and ε_t is the error term. Expected

coefficients are all positive signs. Variables included in this model are adopted from various researchers such as Ahmed, (2000), Mouna and Reza, (2001), Were et al. (2002), Kumar and Rai (2007), Agasha, (2009), Olubango et al. (2009), Allaro, (2010), Folawewo and Olakojo (2010), Amoro and Shen, (2012) and Kingu, (2014) just to mention a few.

Many macroeconomics data particularly time series data are seriously affected by non-stationarity problem as such economic regression on such modeling can provide spurious regression. This implies that mean and variance are time variant and thus basic assumptions of the ordinary least squares (OLS) are violated. In this line, this study finds it is imperative to test for non stationarity and stationarity using Augmented Dickey Fuller test (ADF). Moreover, after testing for non-stationarity and stationarity and find variables are integrated in same order then co integration and error correction model are applied. Non stationary variables means mean and variance are time variant while stationary variables means mean and variances are time invariant whereas covariance between the two-time periods depends on distance or lag and not otherwise (Gujarati, 2004). OLS regression under stationary variables its regression outputs are not spurious. It is important to note that if the residuals of the regression at level are stationary then outputs at level also is not spurious rather it representing the long run relationship output (Granger and Engle, 1987, Gujarati, 2004 and Utkulu, 2012).

Testing for unit root

This study employs Augmented Dickey Fuller (ADF) test in testing for unit root since this test is more powerful than Dickey Fuller (DF) test. We this regard it is imperative to go for powerful test in order to able to get good results in this study.

Testing for Co integration

There are number of methods used in testing for co

integration such as the Dickey-Fuller (DF) or Augmented Dickey Fuller unit root test on the residuals regression from co integrating regression popularly known as Engle-Granger (EG) or Augmented Engle-Granger (AEG) Test, the Co integrating Regression Durbin-Watson (CRDW) test and Johansen (1988) co integration test. This study utilized two techniques in testing for co integration. First, the study employs Engle-Granger residuals co integration test and Johansen co integration test. This is done purposely since the first technique has the power to estimate only one co integrating equation especially in multiple regression analysis as such it is important to supplement that technique with the powerful one such as Johansen co integration test in which has the power of estimating more than one co integrating equations under multiple regression analysis. However, apart from the above weakness Engle-Granger residuals co integration test has the ability to tell whether the equation at level is spurious or not. Thus combining these two tests are imperative decision so as to eliminate the weakness of each test.

Engle-Granger (EG) or Augmented Engle-Granger (AEG) co integration Test.

The Engle-Granger (EG) test for co integration has two step procedures. First step of the Engle-Granger (EG) test requires to fit the co integrating regression by ordinary least squares (OLS) where the variables are at level and are integrated of order one $I(1)$ that is non stationary. Second, to test the residuals obtained from step one (co integrating regression) using the unit root technique being Dickey-Fuller or Augmented Dickey Fuller (ADF). If the residuals are stationary, then reject the null hypothesis of no co integration. On the other hand if they are non stationary do not reject null hypothesis then variables are not co integrated. Study employs the residual series technique (Granger, 1986, Granger and Engle, 1987), using Augmented Dickey-Fuller test where in this context is known as Augmented Engle-Granger (AEG) test employing the following formulation:

- (i) Co integrating regression equation

$$\ln X_t = \alpha_0 + \alpha_1 \ln WP_t + \alpha_2 \ln Q_t + \alpha_3 \ln RER_t + \alpha_4 D_t + \varepsilon_t \quad (3)$$

- (ii) Residuals estimation equation

$$\Delta U_t = \alpha_1 + U_{t-1} + \varepsilon_t \quad (4)$$

$H_0: \alpha_1 = 0$: no co integration (unit root). Variables are not co integrated

$H_1: \alpha_1 \neq 0$: co integrated (no unit root). Variables are co integrated

Decision criteria: Rejection of the null hypothesis implies the residual is stationary. If the residual series is stationary then variables included must be co integrated (Zivot, 2012). On the other hand if the computed absolute value of the tau statistic exceeds the AEG critical values, reject the null and vice versa are true (Gujarati, 2004: 824). Thus, if the residuals of the equation (3) are stationary, then co integrating regression output in step one is not spurious even though individually variables are non stationary (Engle and Granger, 1987 and Gujarati, 2004). Furthermore, provided the study checked that the residuals from co integrating regression are integrated of order zero means are stationary then the traditional regression methodology which include the t and F tests are applicable in data involving non stationary time series. Engle and Granger (1987) contended that "the valuable contribution of the concepts of unit root, co integration is to force us to find out if the regression residuals are stationary. A test for co integration can be thought as a pre test to avoid spurious regression situations" (Gujarati, 2004:822) and the equation (3) in step one is known as co integrating regression whereas α 's are known as co integrating parameters. However, this technique is not free from shortcomings since it is not capable to determine more than one co integrating equations as mention. Thus, best in bivariate regression analysis than multivariate regression analysis. Despite the shortcoming this technique is still applicable in multiple regression analysis since has the power to determine the co integration amongst the variables

as well as providing the clue about the equation in non stationary if it is spurious or not. With this regards, the study utilize the Johansen co integration test in order to find out if there more than one co integrating equations.

The Johansen co integration test

As mentioned earlier that Engle and Granger test has no power to show more than one co integrating equations in multiple regression analysis. In order to resolve the shortcomings of Engle-Granger tests the maximum likelihood method of Johansen (1988) is the proper solution. The Johansen (1988) mostly is used for two main reasons: first to determine the maximum number of co integrating vectors and second is to obtain the maximum likelihood estimators of the co integrating matrix. Moreover, Johansen (1988) has ability to estimate long run and short run parameters using the OLS estimator. Some economic soft ware such as EViews is able to perform this test. This study using EViews 7 so this test performed thoroughly.

Error correction model (ECM)

After being certain that all variables are co integrated, then error correction term is incorporated in the short run coefficients. The error term in short run equation treated as the "equilibrium error" (Engle and Granger, 1987, Watson and Teelucksingh, 2002 and Gujarati, 2004). Error term used to tie the short run behavior to its long run value. Historically error correction term for the first time was used by Sargan and thereafter it was popularized by Engle and Granger in 1987 in their influential seminar paper on "corrects for disequilibrium". They produced an important theorem known as "Granger representation theorem" in which it states that if two variables Y and X are co integrated, then the relationship between the two can be expressed as error correction mechanism (ECM) (Gujarati, 2004:822). So to form the short run equation (5), equation (3) transformed into first difference except dummy variable.

The short run equation expressed as follows:

$$\Delta \ln X_t = \alpha_0 + \alpha_1 \Delta \ln WP_t + \alpha_2 \Delta \ln Q_t + \alpha_3 \Delta \ln RER_t + \alpha_4 D_t + \varepsilon_t \quad (5)$$

Equation above contain only the short run information as such it is imperative to incorporate the error term so as to tie the short run behavior into long run value. So the Error term model (ECM) expressed as follows:

$$\Delta \ln X_t = \alpha_0 + \alpha_1 \Delta \ln WP_t + \alpha_2 \Delta \ln Q_t + \alpha_3 \Delta \ln RER_t + \alpha_4 EC_{t-1} + \alpha_5 D_t + \varepsilon_t \quad (6)$$

The equation (6) according to Engle and Granger (1987) known as error correction model (ECM) since has incorporated the error term (ECt-1) in the short run model. The error correction model (ECM) states that dependent variable (tea export values) depends on the independent variables and also on the equilibrium error term (ECt-1). If the error term is nonzero, this implies that the model is out of equilibrium and vice versa is true. Assume if all the independent variables are zero and error term is positive, this implies that Xt-1 is too high to be in equilibrium, thus Xt-1 is above its equilibrium value. Normally α_4 is expected to be negative, then the error term (ECt-1) is negative and therefore export value (Xt) will be negatively restoring the equilibrium. Therefore if the dependent variable (tea export value-Xt) is above its equilibrium value, then it will start declining in the next period to correct the equilibrium error. Thus, from there they derived the name "error correction mechanism" (ECM). Similarly if the error term (ECt-1) is negative, this implies that dependent variable is below its equilibrium value. Indeed the absolute value of error term reflects how quickly the equilibrium is adjusted (restored). Suppose the error term is statistically equals to zero (insignificant values), this suggests that dependent variable adjusts in independent variables in the same time period (Gujarati, 2004:825). Furthermore, if the residuals of the co integrating regression are stationary then those results are reported as long run coefficients and the coefficients obtained from error correction model (ECM) are reported as short run coefficients.

Non Parametric statistic

MacNemar test has been developed to evaluate the significance of the effect of changes. McNemar test employed in cases where the states of affairs before and after the introduction of change are to be analyzed (Prakash, 2013). The aim of MacNemar test is to be determined the effect of changes in the initial condition or state. In that matter the comparison is to be made between the states before and after the change of the phenomenon. Thus MacNemar test facilitates the evaluation of the effect of change before and after the change. This study examines the effect of changes before and after trade liberalization. MacNemar test examine if there are no significant changes before and after trade liberalization on export performance in tea. In order to test the hypothesis, under McNemar test research sample is divided into two samples as required by this test. Sample one are the data before trade liberalization (n1 = 16) and sample two are data after trade liberalization (n2 = 27). To test the significance of the effect of change, a 2X2 contingency table is required to capture the effect of change before and after. Chi-square test is employed since the cell frequencies are greater than 5 (Prakash, 2013). The 2x2 contingency table is presented as follows:

		AFTER	
		-	+
BEFORE	+	A	B
	-	C	D

For this sample utilizes the chi square under this formula $\chi^2 = \frac{(A-D)^2}{A+D}$. Thus, chi square test with one degree of freedom is used. Decision criteria: If the computed Chi-square value is greater than critical table value under one degree of freedom then, null is rejected of no significant change before and after trade liberalization and vice versa is true (Prakash, 2013).

MODEL ESTIMATIONS AND DISCUSSION OF FINDINGS

This section estimated the unit root, co integration, long run and short run coefficients using the parametric methods stipulated above in section three as well as MacNemar test under non parametric statistic. Estimated coefficients for long run and short run for tea employs equation (3) and (6) respectively.

Unit root results

This study performed unit roots tests as required in time series data. The Augmented Dickey –Fuller

(ADF) test in all variables was performed. The results shows that all variables at level are non stationary as such are integrated of order one I(1). While at first difference all variables are stationary as such are integrated of order zero I(0).

Engle-Granger residuals co integration test results

Furthermore, the study estimated Engle-Granger residuals co integration test using the Augmented Dickey-Fuller tests. Findings reveal that computed value of the tau statistic (-7.000360) in absolute value exceeds the Engle – Granger critical tau values (-2.86154) at 5 percent level (MacKinnon, 2010) then rejected the null hypothesis means that residuals are

Table 4.1 Unit root test results at level and at first difference

AT LEVEL				
Coefficients				
Variables	Without constant and trend	With constant	With constant and trend	Order of integration
Lnexport values	4.049780	-0.814116	-1.171389	I(1)
Ln WP	3.254227	-0.562875	-1.438730	I(1)
LNRER	1.078348	-1.143663	-2.155453	I(1)
LNQ	3.952938	-0.354421	-4.965920	I(1)
FIRST DIFFERENCE				
Coefficients				
Variables	Without constant and trend	With constant	With constant and trend	Order of integration
Lnexport values	-4.625618	-6.361633	-6.377288	I(0)
Ln WP	-5.373711	-6.992673	-6.952918	I(0)
LNRER	-7.934954	-8.550251	-8.490475	I(0)
LNQ	-2.050710	-5.207219	-5.080623	I(0)

Without constant and trend: Test critical values: 1%, 5% and 10%, with constant: Test critical values: 1%, 5% and 10%, with constant and trend: Test critical values: 1%, 5% and 10%. Notes: If variables are integrated of order one I(1) means variables are non stationary. If variables are integrated of order zero I(0) means variables are stationary

Table 4.2 Engle-Granger residuals co integration results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002258	0.017925	0.125959	0.9004
RESID (-1)	-1.097239	0.156740	-7.000360	0.0000

Dependent Variable: DRESID

Determinants of Export Performance of Tea in Tanzania: Parametric and Non Parametric Analysis

stationary and implies variables are co integrated. Since tau statistic obtained is (-7.000360) and it is significant at 5 percent level of significance. Thus it is concluded that, the regression output obtained in non stationary variables are no longer spurious. Its empirical results are used to present the long run relationships amongst the variables.

Johansen co integration test results

The Johansen co integration test results supported the findings obtained in the previous test in Engle-Granger residuals co integration test. The powerful test which is trace statistic confirms that there are two co integrating equations whereas max-eigen statistic indicates no co integrating equation.

Long run coefficients

The significant determinants of tea export performance in long run are world prices and

production quantities whereas real exchange rates and dummy variable are not significant determinants of tea export performance as depicted in table 4.4 below. World prices have the positive sign (1.108703) and statistically significant at 5 percent level of significance. This implies that other things remain constant; one percent increase in world price increases tea export performance by 1.108703 percent. Production quantities have expected sign (0.659435) and statistically significant at 5 percent level of significance. This suggests that one percent increase in production quantity increases tea export performance by 0.659435 percent. However, real exchange rates have negative sign (-0.005560) and statistically insignificant at 5 percent level of significance. Dummy variable has a negative sign (-0.209056) and statistically insignificant at 5 percent level of significance. Thus, these imply that real exchange rates and dummy

Table 4.3 Johansen co integration results

Rank Test (Trace)				Rank Test (Maximum Eigenvalue)			
Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	P-values	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	P-values
None *	57.06432	47.85613	0.0054	None	25.17418	27.58434	0.0986
At most 1 *	31.89014	29.79707	0.0283	At most 1	19.75817	21.13162	0.0769
At most 2	12.13198	15.49471	0.1507	At most 2	10.66802	14.26460	0.1717
At most 3	1.463955	3.841466	0.2263	At most 3	1.463955	3.841466	0.2263

Notes: Trace test indicates there are two (2) co integrating equations at the 0.05 critical levels whereas Max-Eigen statistic test indicates no co integrating equations at the 0.05 critical levels.

*denotes rejection of the hypothesis at the 0.05 critical level under MacKinnon-Haug-Michelis (1999) p-values

Table 4.4 Long run coefficients results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.045675	1.146250	1.784667	0.0823
LNPRICE	1.108703	0.042306	26.20686	0.0000
LNRRER	-0.005560	0.026986	-0.206040	0.8379
LNQ	0.659435	0.148061	4.453814	0.0001
DUMMY	-0.209056	0.117593	-1.777802	0.0834

Durbin-Watson statistic: 2.171696 and Adjusted R-squared: 0.997958

Determinants of Export Performance of Tea in Tanzania: Parametric and Non Parametric Analysis

variable affecting tea export growth negatively. Thus, internal and external determinants are chief factors which promote tea export performance in Tanzania. These results are similar with the previous observations by Jongwanich (2007), Abolagba et al. (2010), Allaro (2010), Folawewo and Olakojo and Amoro and shen (2012). A real exchange rates result is line with Kumar and Rai (2007) result in India where they found that real exchange rate was not a determinant of tomato export from India.

Short run coefficients results

In short run coefficients, world prices remains important determinant of tea export performance since have positive sign (0.910818) and statistically significant at 5 percent level of significance. This suggests that other things remain constant, one percent increase in world price increases tea export performance by 0.910818 percent. On the other hand, error term (EC_{t-1}) found with expected negative sign (-0.721545) and statistically significant at 5 percent level of significance. This result implies that variables have long run relationship and adjusting to restore the equilibrium at the speed of 72 percent per annum. Therefore, error term result confirmed the co integration results obtained in Engle-Granger and Johansen co integration tests. However, production quantities in short run found to be insignificant determinant of tea export performance since have positive (0.097888) but statistically insignificant at 5 percent level of significance. Furthermore, real exchange rates and dummy variable remains

insignificant determinants of tea export performance in short run. Notwithstanding, in short run have positive signs but still are statistically insignificant at 5 percent level of significance. Real exchange rates have (0.026637) as well as dummy variable has (0.003267) but are insignificants factors. Thus, real exchange rates and dummy variable have positive contributions in short run but statistically insignificant. Moreover, estimations of tea export performance consider all the diagnostic tests as required by the ordinary least square such as absence of serial correlation in error terms, presence of homoscedasticity, presence of normality and good model specification. Employing Breusch-Godfrey, Breusch-Pagan-Godfrey and Jarque Bera respectively passed these entire diagnostic tests.

Non parametric test result

As a way to ascertain the dummy variable results obtained in long run and short run. This study performed the non parametric test using MacNemar test. In the computation the study finds that the computed Chi-square (2) is less than critical value (3.84) at one degree of freedom. The result failed to reject null hypothesis of no significant changes before and after trade liberalization on tea export performance similar to dummy variables obtained in parametric technique. Therefore both parametric and non parametric techniques affirmed that trade liberalization in tea industry has no significant impact on improving tea export performance under the period of study.

Table 4.5 Short run coefficients results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.036226	0.027205	1.331597	0.1914
DLNPRICE	0.910818	0.060764	14.98952	0.0000
DLNRRER	0.026637	0.023771	1.120596	0.2699
DLNQTE	0.097888	0.159441	0.613943	0.5431
ECt-1	-0.721545	0.153544	-4.699261	0.0000
DUMMY	0.003267	0.032726	0.099817	0.9210

Adjusted R-squared: 0.872754 and Durbin-Watson statistic: 1.852460

CONCLUSION, MANAGERIAL IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

Conclusively, this study reveals that world prices and production quantities in long run are main determinants of tea export performance. On the other hand real exchange rates and dummy variable are insignificant determinants of tea export performance. In short run, world prices remains important determinant of tea export performance while other variables like real exchange rates, production quantities and dummy variable are statistically insignificant determinants of tea export performance. In the same line, non parametric statistic under MacNemar test provides the similar result as in dummy variable that trade liberalization has no significant changes before and after trade liberalization in tea export performance. Thus the recommendations for tea export performance are straight forward based on the obtained results, since tea export performance mostly determined by internal and external factors then the government should improve the business environment for tea and production capacity of tea for both estate and smallholder producers by subsidizing some important agricultural inputs. Ignoring these factors will be disastrous to tea industry since other variables like real exchange rates and trade policy are not important determinants of tea export performance. Policy implications of this study mainly based on the empirical findings, Tanzanian government and other beneficiaries they should capitalize in qualities of tea and production quantities in order to increase the export performance of tea in Tanzania. Furthermore, business environment should be improved since trade liberalization found to be inefficient since its inception due parametric and non parametric analysis evidences. On the other hand, this study is

not free from limitations; there are some limitations. First, regression analysis in time series followed the supply side approach in estimating determinants of tea export performance as such we did not look determinants of export growth at demand side approach. The second limitation based on the types of data we employ. This study utilized secondary data from various sources as such there may be some errors in figures (data) we employ but we have no ability to rectify that weakness since are prepared by certain authorities other than researcher themselves. However, it is important to note that using secondary data in research theoretically is not a problem. Further areas of research: other studies may examine the determinants of export performance on agricultural products using demand side approach. Second, inclusions of new variables in their study apart from world prices, production quantities and real exchange rates and third, other cash crop which are not included in this study should be studied so as to see if they will bring similar or different results.

REFERENCES

- Abolagba, E.O., Onyekwere, N.C., Agbonkolor, B.N., & Umar, H.Y. (2010). "Determinants of agricultural exports." *Journal of Human Ecology*, 29(3), 181-184.
- Agasha, N. (2009). "Determinants of export growth rate in Uganda 1987-2006." Uganda revenue authority, research and planning, Kampala, Uganda.
- Ahmed, N.U. (2000). "Export responses to trade liberalization in Bangladesh." *A Cointegration analysis. Applied Economics*, 32, 1077-84.
- Allaro, H. B. (2010): "Export performance of oilseeds and its determinants in Ethiopia." *Journal of Cereals and Oilseeds*, 2(1), 1-15.
- Allaro, H. B. (2012): The impact of trade liberalization on the Ethiopia's trade balance. *American Journal of Economics*, 2(5), 75-81.
- Amoro, G & Shen, Y. (2012): "The determinants of agricultural export: Cocoa and Rubber in Cote d'Ivoire." *International Journal of Economics and Finance*; 5(1) 1916-97.
- Anwar, S., Shaikat, F., & Hussain, Z. (2010). "Impact of trade liberalization on export of cotton from Pakistan: A time series

analysis." *Sarhad Journal of agriculture*, 26 (2).

- Bargawi, H (2008): Tanzania's Agricultural Institutions in Flux: Lessons from Coffee and Cotton Producing Villages: Working Paper No 2009/20, September 2008, NCCR Trade Working Papers.
- Bashir, Z. (2003). "The impacts of economic reforms and trade liberalization on agricultural export performance in Pakistan." *The Pakistan Development Review* 42 (4), 941-960.
- Engle, R. F. & Granger, C. W. J. (1987) "Cointegration and error correction representation: estimation and testing", *Econometrica*, Vol. 55, pp. 251-276.
- Gbetnkom, D., & Khan, S. A. (2002). Determinants of agricultural exports: The case of Cameroon: AERC Research Paper 120 African Economic Research Consortium, Nairobi.
- Gujarati, D. N. (2004). "Basic econometrics," 4th edition. USA: United States Military Academy, West Point. Online book.
- Granger, C. W. J (1986). Developments in the study of co integrated economic variables: Oxford bulletin of economics and statistics, 48, 3, 0305-9049.
- Hatab, A.A., Romstad, E. & Huo, X. (2010): "Determinants of Egyptian agricultural exports: A gravity model approach". *Modern Economy*, 1, 134-143. doi:10.4236/me.2010.13015 (<http://www.SciRP.org/journal/me>).
- Jenkins, R (1997) "Trade Liberalisation in Latin America: the Bolivian Case1". *Bull. Latin Am. Res.* Vol. 16, No.3, 307-325.
- Jongwanich, J (2007): Determinants of Export Performance in East and Southeast Asia: Economics and Research Development Working Paper Series No.106, Asian Development Bank.
- Kanaan, O. (2000). Tanzania's experience with trade liberalization. *Finance and Development*, 37 (2), 1-7. Retrieved from General One File database.
- Kazungu, K. (2009). "Trade Liberalization and the Structure of Production in Tanzania". Unpublished Doctoral thesis, University of Glasgow, United Kingdom.
- Kingu, J (2014). "Determinants of Tanzanian agricultural exports: A case of cotton lint", *The Journal of Developing country studies*, Vol.4 No.1, 2014:91-104.
- Kumar, N. R., & Rai, M. (2007). Performance, competitiveness and determinants of tomato export from India. *Agricultural economics research review* Vol. 20 (Conference Issue), India, pp (551-562).
- Kusi, N. K. (2002). Trade Liberalization and South Africa's Export Performance: 2002 Annual Forum at Glenburn Lodge, Muldersdrift: Trade and Industrial Policy Strategies.

- Mold, A., & Prizzon, A. (2010). "Fragile states, commodity booms and export performance: analysis of the Sub Saharan African case". *Ideas.repec.org/p/rseui/2010-21.html*.
- Mouna, C and Reza, J. N. A (2001) "Trade Liberalization, Real Exchange Rate, and Export Diversification in Selected North African Economies. Particularly in Tunisia, Algeria and Morocco", www.erf.org.eg/CMS/getFile.php?id=847
- Penélope-López. (2005). "The effect of trade liberalization on exports, imports, the balance of trade, and growth: The case of Mexico". *Journal of Post Keynesian Economics*, 27(4), 595-619.
- Prakash, S (2013). "Non parametric methods of research in management": Handout, 2013, BIMTECH, India.
- Rodrick, D (1992) "The Case for Trade Liberalization in Developing Countries". *The Journal of Economic Perspectives*, Vol. 6, No. 1: 69-85
- Rweyemamu, D. (2003). "Reforms in the agricultural sector: The Tanzanian experience". A paper submitted to GDN under the Global Development Award Competition 2003. Agricultural Reforms and Rural Development in LICs Economic and Social Research Foundation, Tanzania
- Samuelson, P & Nordhaus, W. D. (2010). *Economics: Indian adaptation by Chaudhuri, S & Sen, A*, 19th edition. New Delhi: Tata McGraw Hill Education Private Limited.
- Santos-Paulino. (2003). "Trade Liberalization and trade performance in the Dominican Republic". *Journal of International Development*, 18, 925-944.
- Sloman, J. (2006). *Economics: six edition*. India: Dorling Kindersely (India) pvt, Ltd.
- Sloman, J., Hinde, K., & Garratt, D. (2010). *Economics for business: 5th edition*. UK: Pearson Education Limited.
- Thirlwall A. P. Trade (2000) "Trade Liberalization and Economic Growth: Theory and Evidence": The African Development Bank: Economic Research Papers NO 63
- Utkulu, U (2012). "How to estimate long-run relationships in economics: an overview of recent development". Retrieved 10/07/2013: kisi.deu.edu.tr/utku.utkul u/dosyalar/How_to_estimate_DOC
- Watson, P.K & Teelucksingh, S.S (2002): A practical introduction to econometric methods: classical and modern: Online book, University of the West Indies Press: 1A Aqueduct Flats Mona, Kingston 7 Jamaica.
- Were, M., Ndung'u, N. S., Geda, A., & Karingi, S. N. (2002). "Analysis of Kenya's export performance: An empirical evaluation". Paper presented at Kenya Institute for Public Policy: Research and Analysis: KIPPRA Discussion Paper No. 22.
- Yeboah, A.O., Shaik, S., Wozniak, S., & Allen, A. J. (2008).

Determinants of Export Performance of Tea in Tanzania: Parametric and Non Parametric Analysis

"Increased cocoa bean exports under trade liberalization: A gravity model approach," Paper presented at the annual meeting at Applied Economics & Agriscience Education, Dallas, Texas. <http://purl.umn.edu/6819>.

Yusuf A. S and Edom, C.O (2007): Determinants of timber exports in Nigeria: an error correction modeling approach. Munich Personal RePEc Archive: Online at <http://mpa.ub.uni-muenchen.de/2608/> MPRA Paper No.2608, posted 6. April 2007.

Zivot, E (2012). Estimation and Inference in Cointegration Models: Economics 582

Zulfiqar K., & Kausar, R. (2012). "Trade liberalization, exchange rate and export growth in Pakistan", Far East Journal of Psychology and Business, 9 (2).

BRIEF PROFILE OF THE AUTHOR

John Kingu, PhD. is a Lecturer in Economics Area at Institute of Finance Management (IFM), Dar es salaam, Tanzania. He has done Ph.D. on "Economics of globalization: Determinants of Export Performance of Selected Cash Agri-products - Pre and Post Trade

Liberalization in Tanzania" from the Department of Management Studies, Mohanlal Sukhadia University, Udaipur, India. He did MA-Economics from The University of Leeds, UK and Bachelor of Arts with Education (BAED) from The University of Dar es salaam (UDSM), Dar es salaam, Tanzania. He has about eleven years of teaching experience. His research papers have been published in reputed journals like Journal of Economics and Sustainable Development, (IISTE, USA); The African Journal of Finance and Management, (IFM, Tanzania); Journal of Global Economics, Management and Business Research, (IKP, India); Journal of Poverty, Investment and Development (IISTE, USA); and The Journal of developing country studies (IISTE, USA) among others.

He has done research work on Challenges and Prospects for Planning at Local Government level in Tanzania: Experience from selected local government councils sponsored by Netherland government while being in the teaching at IFM. His research interests are in the area of Economics of globalization, Macroeconomics issues, Microeconomic issues and international business.