International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. X, Issue 6, June 2022

http://ijecm.co.uk/

DETERMINANTS OF COTTON COMPETITIVENESS IN ZIMBABWE

Kuwenyi Sinikiwe
University of Eswatini, Eswatini
skuwenyi@gmail.com

Awoyemi Taiwo Timothy
University of Ibadan, Nigeria
tt.awoyemi@ui.edu.ng

Douglas Kibirige
University of Eswatini, Eswatini
kibirige@uniswa.sz

Abstract

Competitiveness of cotton plays a critical role in maximising trade gains in economies. Despite its importance, the competitiveness of cotton and determinants are less known in Zimbabwe. This study aims at establishing the competitiveness levels of cotton for the period 1980 to 2016 in Zimbabwe using FAOSTAT data. RTA and Johansen cointegration were among the methods used in the study to determine the competitiveness levels and determinants. The findings of the study indicate that Zimbabwe had competitiveness in cotton production and exportation within the SADC region. In the short-run, cotton's competitiveness is affected by imports, exports, yield, and SADC exports. In the long run, all the variables became significant indicating their importance in ensuring the competitiveness of the agricultural sector. To improve the competitiveness of cotton, the study recommends the smoothening of the production and exportation process. There is also need to discourage imports by applying import substitution strategies within the country.

Keywords: Competitiveness, relative trade advantage, Johansen cointegration, SADC, Zimbabwe

INTRODUCTION

Cotton is an important export oriented commodity in Zimbabwe produced for both seed and lint (Poulton & Hanyani-Mlambo, 2009). Being a dry land commodity, cotton has great production and exportation potential as most parts of the country are suitable for the production of at least one of its varieties`, unlike other commodities such as tobacco and sugarcane, which are grown in specific regions (Keyser, 2002). Production is mainly carried out on contract farming whereby farmers receive inputs (seed, fertilizer, and chemicals) and in turn supply over 15 contractors with the harvested commodity for processing (Kamoyo et al., 2015). Zimbabwe has a ginning capacity of 750,000 tonnes per year in the 22 ginners countrywide (Esterhuizen, 2017) which are under-utilised as current production is less than 600,000 tonnes (RBZ, 2017). This was because cotton production in Zimbabwe was heavily affected by the land reform programme and severe droughts which reduced production to the lowest yield ever of 65,000 bales in 2015 (RBZ, 2016) resulting in a drop in exports.

Zimbabwe, being a member of several pro-free trade organizations including the World Trade Organisation (WTO), Common Market for East and Southern Africa (COMESA), African Union (AU), and Southern African Development Community (SADC), is exposed to both regional and global competition. This has resulted in intense pressure on the agricultural commodities especially cotton which mostly comprises of small-scale farmers to produce quality commodities competitive on the international market (Mukarumbwa & Mushunje, 2010). There is therefore, a need to understand the competitiveness levels of Zimbabwean cotton within the SADC region and its determinants.

Current studies in Zimbabwe have looked at the general agricultural commodities' competitiveness by determining its comparative advantage, while others have looked at specific commodities such as wheat and poultry competitiveness (Chawarika et al, 2017; Zengeni, 2017). This has left a gap in understanding the competitiveness of export oriented commodities such as cotton which bring in the much needed foreign currency. Therefore, the main aim of this study is to determine the competitiveness levels of cotton and its determining factors.

Conceptual perspectives of competitiveness

Competitiveness is a broad concept involving the ability to innovate and upgrade industries, producing and providing a superior product on the markets, generation of income, and the laws and policies enacted by the good government, which determine productivity (Porter, 1990; Onyemenam, 2004; WEF, 2017). The four main pillars which result in competitiveness include the availability of resources (land), demand, institutions and government policies, and global performance (Porter, 1990).

These main pillars are drawn directly from both the classical and neoclassical theories. The theories of comparative advantage and the Heckshian and Ohlin model significantly provide theoretical backing and understanding to the concept of competitiveness. The theory of comparative advantage provides the importance of trade indicting that countries without absolute advantage can still trade while the HO models adds more factors of production.

Competitiveness model

The double diamond model as shown in Figure 1, was formulated by Rugman and D' Cruz (1993) and later extended by Moon, Rugman, and Verbeke (1998) who came up with the generalized double diamond model.

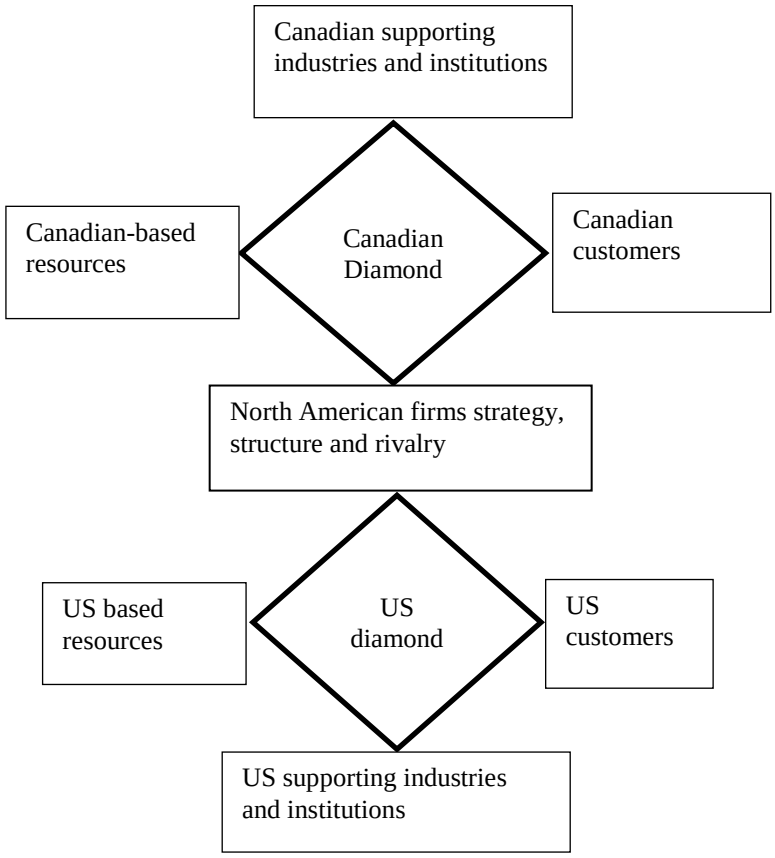

Figure 1: Double Diamond Model

Source: Rugman and D' Cruz (1993)

The model maintains the four groups of factors affecting competitiveness in the diamond model but goes on to divide the factors into domestic and international. This addition by Rugman and D'Cruz brings in a very important point that international factors also play a vital

role in achieving competitiveness. Factors external to the domestic market are labelled as the diamond of the trading partner and include the resource endowments, its industry structure and strategies, and the demand for their commodities.

In studying the competitiveness of agricultural commodities, the double diamond model draws the theoretical aspects of the comparative advantage and Heckscher and Ohlin theories. The model brings out the trade gains enjoyed when each country utilises its abundant resources.

RESEARCH METHOD

The Relative trade advantage (RTA) index was used to calculate the competitiveness levels in Zimbabwe for the period 1980- 2016. The RTA index was chosen because it compares two countries' share of traded goods relative to each other by measuring the import and export intensities. RTA is obtained as the difference between relative export advantage (RXA) and the relative import advantage (RMA) indicating whether a country has a comparative advantage or disadvantage. The RTA index is expressed using the following formulae (Fertö & Hubbard, 2002; Alidou et al., 2017):

RTA = RXA-RMA

$RXA_{ij} = \frac{X_{ijt}/X_{iwt}}{\sum X_{jt}/\sum X_{wt}}$ = RCA

$RMA = \frac{m_{ijt}/m_{iwt}}{\Sigma m_{jt}/\Sigma m_{wt}}$

RTA = $\frac{X_{ijt}/X_{iwt}}{\sum X_{jt}/\sum X_{wt}} - \frac{m_{ijt}/m_{iwt}}{\Sigma m_{jt}/\Sigma m_{wt}}$

Where

X_{ijt} = Exports of country j for product i in time t

X_{ist} = Country s exports for product i in time t

X_{jt} = Total exports for country j in time t

X_{st} = Total exports for country s in time t

m_{ijt} = Imports of country j for product i in time t

m_{ist}= Country s imports for product i in time t

m_{jt} = Total imports of country j in time t

m_{st}= Total imports for country s time t

Factors Affecting Competitiveness

Factors that affect competitiveness were centred on the Double diamond model (highly related to Porter's diamond model) which separates the four sources of competitiveness as factor conditions, demand conditions, firm's strategy of related and supporting industries into domestic and international factors (Rugman & D' Cruz, 1993). In studying the competitiveness of agricultural commodities, the double diamond model draws the theoretical aspects of the Heckscher and Ohlin theory. The model brings out the trade gains enjoyed when each country utilises its abundant resources.

The factors which affect competitiveness differ per region and per country however, despite these differences, it is generally agreed that land size, yield, exports, imports, GDP, and GDPP influence competitiveness (Fertö & Hubbard, 2002; Kharlamova & Vertelieva, 2013; Ndlangamandla et al., 2016; Šegota et al., 2017).

RTA = f (land size, yield, price, GDP, GDPP, Zimbabwean cotton exports other Zimbabwean exports, SADC cotton exports, other SADC exports).

The independent variables proposed for the study include: yield, total imports, total exports, size of cultivated land, SADC exports, and imports, hence the model becomes;

$$Y = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \cdots + \beta_n X_{nt} + \varepsilon_t$$

Where

Y = RTA score representing competitiveness; X_i is the series of exogenous variables;

X_1 =Land size (ha)

X_2 = Yield (metric tonnes)

X_3 = Global cotton price (USD)

X_4= Real GDP (USD)

X_5= GDPP (USD)

X_6= Price of Zimbabwean cotton exports (USD)

X_7 = Quantity of Zimbabwean cotton exports (tonnes)

X_8 = Quantity of Zimbabwean agricultural exports cotton (tonnes)

X_9 = Quantity of global cotton exports (tonnes)

X_{10}= Quantity of global agricultural exports excluding cotton (tonnes)

X_{11} = Quantity of Zimbabwean imports cotton (tonnes)

ε_t = The error term

The Johansen Cointegration analysis (Johansen, 1988) was used to analyse the factors affecting the competitiveness of cotton in Zimbabwe. This was achieved by first carrying out a bivariate analysis to determine variables that had a relationship with the dependent variable (competitiveness). The Johansen cointegration was chosen due to its ability to show the relationship between variables both in the short and long term (Harris, 1995).

To ensure stationarity of the data, Gujarati and Porter (2009) state that the mean and variance of the data need to be stationary over time while the covariance depends only on the lags and not the time of computation. The model for factors affecting Zimbabwean agricultural commodities' competitiveness uses time-series data that is liable to non-stationarity. The time-series data are said to be stationary if their means and variances are independent of time (Gujarati, 2004). Ignoring non-stationarity and treating the series as stationary cause bias, and thus misleading the economic analysis. Therefore, the model may fail to forecast meaningful outcomes and can result in spurious or nonsensical regressions. Non-stationarity can be corrected through detrending or differencing the time-series processes.

This study used differencing to correct for non-stationarity by assuming that the series has a unit root and the Augmented Dickey-Fuller test was used to test for stationarity. Variables that are stationary at levels are said to be integrated of order zero (I(0)), and data that become stationary after the first difference are said to be integrated of order one (I(1)) (Harris, 1995).

To test for stationarity, the Shapiro-Wilk test was first applied to the data, this is a normality test to check if data are normally distributed. The null hypothesis that data are normally distributed is accepted if p>=0.05. The stationarity of data is further tested using the augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1981), several lags of the dependent variable (competitiveness) were added to the regression to 'whiten' the errors as the ADF test assumes the presence of 'white noise' errors in regression (Levin, Lin & Chu, 2002). The *ur.df* function in R was used to test the data both at levels and first difference for stationarity.

H_0: α=1 unit root

H_1: α <1 integrated of order zero.

RESULTS

The Shapiro -Wilk Normality Test

The Shapiro-Wilk results in Table 1 provide results to check whether or not the data used in the study were normally distributed. The results revealed that all cotton related variables except, yield, land, and exports were significant. Other variables such as GDP, GDPP, and FDI

also had p-values that were less than 0.05. The study rejected the null hypothesis that data is normally distributed due to the presence of p-values that were less than 0.05 justifying a need to carry out the ADF tests and correct for stationarity.

Table 1 The Shapiro- Wilk Normality Test

	W	p- value
Cotton		
Yield	0.97717	0.633
Land	0.9796	0.699
Exports quantity	0.95729	0.1659
Imports quantity	0.60113	$7.963e^{-0.9}$
Price	0.86162	0.0002974
RTA	0.9271	0.01821
Zimbabwe exports	0.86515	0.0003635
SADC cotton exports	0.9199	0.01105
SADC exports	0.90747	0.004786
GDP	0.93551	0.03326
GDPP	0.89369	0.001978
FDI	0.73032	$6.777e^{-0.7}$

Unit Root Test

To further test for stationarity of the data, the ADF test (Dickey and Fuller, 1981) was applied to the data. This is the first formal test done on the data to test for stationarity. It is important because it gives the order of integration and it gives the econometric framework for the analysis (Harris, 1995). The ADF test was conducted on all three commodities to establish the order of integration. This is important as it is a requirement for us to choose between multivariate integration and Auto Regressive Distributive Lag (ARDL) test. It is important to check for unit roots testing for data normality (Levin et al., 2002). ACF and PCF graphs were used to visualise the data and identify the presence of unit-roots.

In the ADF test, the lags of the first difference are included for the trend and intercept. To correct for stationarity the log of the first differences was taken. The null hypothesis was rejected depending on how strongly negative the test statistic value was observed. The test statistic was weakly negative at levels and had lags, hence the study accepted the null hypothesis that the unit root existed (Table 2). However, at the first difference, the data had no lags and the test statistics were all strongly negative, hence the

null hypothesis was rejected and concluded that a unit root did not exist. Therefore, the data became stationary at first difference. The results reveal that there were no lags observed for all the variables at first difference implying all variables were I(1) or stationary (Levin et al., 2002). The study was therefore analysed using the Johansen multivariate cointegration (Johansen, 1988) as the requirement of integration was for all variables to be stationary was met.

Table 2 ADF Test for Unit Roots

	At levels				1st Difference			
	Lags	**Trend + intercept**	**Intercept**	**None**	**lags**	**Trend + intercept**	**Intercept**	**None**
Cotton (cot)								
Yield	5	0.370	1.908	-0.315	0	-7.535	-7.404	-7.514
Land	4	-2.113	-1.387	-1.628	0	-9.047	-9.188	-9.118
Cot exports	2	-2.679	-2.679	-2.067	0	-7.953	-7.964	-8.75
Cot imports	3	-3.053	-2.969	-2.460	0	-5.978	-6.069	-6.16
Price	1	-3.130	-2.976	-2.653	0	-7.860	8.106	8.220
SADC cot exports	8	-0.737	-0.735	0.385	0	-7.418	-7.497	-7.608
RTA	2	-3.170	-2.862	-1.132	0	-8.170	-8.326	-8.437
Zim exports	3	-1.028	-1.028	-0.684	0	-7.688	-7.763	-7.88
Zim imports	6	-1.372	0.198	1.34	0	-7.656	-7.726	-7.677
SADC exports	4	-1.466	0.218	1.646	0	-6.905	-6.864	-6.888
GDP	3	-2.588	-2.542	0.110	0	-3.590	-3.654	-3.652
GDPP	3	-1.030	-1.162	0.240	0	-4.55	-3.964	-4.008
FDI	3	-2.078	-0.954	- 0.300	0	-7.711	-7.759	-7.711

Cotton Competitiveness

Table 3 shows that cotton competitiveness (RTA) had a sharp decrease from 2002 to 2005 due to severe drought coupled with a government policy that enforced foreign export proceeds being paid in highly inflationary local Zimbabwe currency (Poulton & Hanyani-Mlambo, 2009; Fang et al*.,* 2020). In 2005 exports were pegged using the underperforming local currency, hence discouraging the production and exportation of cotton (MacNair, 2014). However, changes to pro export policies (such as pegging export-oriented products in foreign currency) resulted in a sharp increase in the competitiveness of cotton from 2005 to 2011 as this reduced the effects of inflation on commodities (Poulton et al., 2002).

Table 3 Cotton Balassa RTA Indices

Year	RTA	Year	RTA	Year	RTA
1980	7.254	1993	2.435	2005	-2.869
1981	3.781	1994	2.915	2006	1.029
1982	2.999	1995	1.73	2007	-1.128
1983	4.597	1996	1.341	2008	1.863
1984	5.26	1997	2.277	2009	5.381
1985	4.537	1998	3.352	2010	4.525
1986	5.327	1999	3.291	2011	6.275
1987	4.537	2000	3.822	2012	3.411
1988	4.449	2001	4.169	2013	3.398
1989	4.44	2002	4.736	2014	3.206
1990	3.747	2003	3.861	2015	2.842
1991	2.948	2004	3.875	2016	1.97
1992	2.435				

Cotton's competitiveness, decreased after 2011 as the country suffered from the effects of dollarisation which rendered the Zimbabwean adopted USD expensive to buy. This implies that Zimbabwean cotton was more expensive on the international market making it uncompetitive.

The Johansen cointegration analysis (Johansen, 1988) was conducted to assess the influence of the selected independent variables on competitiveness. Cointegration analysis was chosen because it solves the problem of determining both long-term and short-term relations between variables by ensuring that data were best described and could be used for forecasting (Harris, 1995).

Cotton Short-run Analysis

Table 4 presents the short-run Johansen multivariate cointegration model's results for cotton.

Overall, the short-run model was significant with a model fit value of 9.98 (p= 0.000). About 80% variation in competitiveness was explained by the given independent variables. All variables were found to have expected signs as per literature. The model had an ect coefficient of -1.294613 showing its ability to return to equilibrium. This means that in the event of a shock, there is a 129% chance of returning to equilibrium.

Table 4 Cotton Short-run Relationship

Variables	Estimates	std. error	t-value	p-value
Ect	-1.295	0.244	-5.29	0.000***
Constant	3.625	0.704	5.147	0.000***
Competitiveness	-1.300	0.199	-6.526	0.000***
Cotton imports	-0.057	0.0106	-5.388	0.000***
Yield	0.553	0.3227	1.713	0.0992*
Cotton exports	0.023	0.0126	1.805	0.0832*
Zim exports	-0.004	0.00283	-1.478	0.152
SADC cotton exports	-0.020	0.00798	-2.556	0.017**
Zim imports	0.00238	0.0024	0.995	0.321
SADC exports	-0.00353	0.00820	-0.431	0.6701
R square	0.80			
Adjusted r square	0.720			
F statistic	9.976			
p-value	0.000			

*Significant codes *** =< 0.01, ** =< 0.05, * = < 0.1*

The results further show that, in the short-run, cotton imports were an important factor in determining competitiveness (p=0.057). A 1% increase in imports decreases the competitiveness of Zimbabwean cotton by 0.057% indicating a negative relationship between the variables. Increased cotton imports into the country reduce the domestic market by increasing the options for the local demand. The ability to import cotton plays an important role in competitiveness as it brings in competition from the international market which may contain more efficient producers. Zimbabwe is bordered by large cotton producers within the SADC region such as Mozambique, Malawi, and Zambia (Bennett, Salm & Greenberg, 2011). These countries enjoy tariff-free trade onto the Zimbabwean market without any restrictions hence, to succeed in such markets, there is a need for a highly competitive product that can compete on both domestic and international markets.

The variable SADC cotton exports were found to negatively affect the competitiveness of Zimbabwean cotton (p=0.017). Increasing SADC cotton exports by 1% would reduce competitiveness by 0.02%. This was expected as increasing SADC exports increases competition on Zimbabwean cotton reducing its competitiveness. Trade within SADC has lowered trade costs due to the ability to use the road system as a cheaper mode of transportation for goods and services leading to an increased exchange of goods within the region. Increased exports from other SADC members, therefore, reach markets at relatively low

costs. This would also have an impact on the price of cotton as more farmers and countries become more efficient in cotton production resulting in Zimbabwe's commodity becoming less competitive over time.

Cotton exports were found significant at 10% level (p = 0.0832). Cotton exports positively influenced the competitiveness of Zimbabwean cotton, as a 1 unit increase in cotton exports increased competitiveness by 0.023. In Zimbabwe cotton is mainly purchased by merchants who then initiate the processing of the cotton into lint and seed before marketing on the international markets (Kamoyo et al., 2015). The ability to compete therefore depends on the quality of the cotton harvested and processed. Producing quality cotton leads to increased exports which directly results in improved competitiveness.

Yield also plays a role in ensuring the competitiveness of Zimbabwean cotton (p=0.009) as a 1% increase in yield increases competitiveness by 0.55%. Yield is defined as output per unit area. This means that increasing output per fixed piece of land leads to the competitiveness of Zimbabwean cotton. This is only possible through achieving efficiency in the production process of cotton as more output is needed to be produced on a given piece of land. This shows that the Zimbabwean problem is not of the size of cultivated land but of how efficiently the land can be utilised (Poulton & Hanyani-Mlambo, 2009). In Zimbabwe, cotton production is mainly carried out by small-scale and peasant farmers who can produce on their own or under a contract (Kamoyo et al., 2015). Increasing yield is therefore paramount to these farmers as it improves their earnings. This, therefore, raises the need for improved extension services that assist farmers to improve their yields. The results contradict Narayan and Battacharya (2019) who found yield was an unimportant variable in explaining competitiveness.

Cotton Long-run Analysis

The long-term results in Table 5 show that SADC other exports had no long-term influence on the competitiveness of cotton in Zimbabwe. All other variables were highly significant at 1%. This means that in the long-run competitiveness of Zimbabwean cotton is not influenced by regional production and exportation, but by factors that are directly linked to Zimbabwe. To improve the country's competitiveness, Zimbabwe needs to focus much more on internal factors such as its production process and exportation.

Yield had a negative highly significant effect on competitiveness. This indicates that's producers and policymakers make to look beyond achieving high yield and focus on other related factors such as the intensification of land use to produce more and hence increase competitiveness.

Table 5 Cotton Long-run Results

Variable	Estimate	Standard error	p-value
Competitiveness	1.000000		
Cotton imports	0.0657	0.003597	0.000***
Yield	-0.874	0.1515527	0.000***
Cotton exports	-0.032	0.0052541	0.000***
Zim exports	0.006	0.00108593	0.000***
SADC cotton exports	0.0162	0.00383437	0.000***
Zim imports	-0.0041	0.000762622	0.000***
SADC other exports	-0.000733	0.00402296	0.388

*Significant codes *** =< 0.01, ** =< 0.05, * = < 0.1*

The long run results show that all other variables except SADC other exports become important variables in determining the competitiveness of Zimbabwean cotton. There is, therefore, a need to boost production and exportation of cotton. This can be achieved by reaching out to small-scale farmers and offering incentives for improved yield. The introduction of irrigation facilities will greatly improve yield as most of the crops are under rain-fed system meanwhile, the country has been receiving erratic rainfall (Keyser, 2002). Provision of input subsidies to small scale farmers coupled with extension services will lead to improved yield.

CONCLUSION AND RECOMMENDATIONS

Zimbabwean cotton was competitive for the period under study. Periods of extremely low competitiveness were noted to be in 1993 and 2005. These were drought and economic meltdown years respectively.

Economic activities in Zimbabwe change very fast, hence the factors which affect competitiveness in the short-run are expected to be much more useful than the long-term results. This is because as events change at a faster rate, the response needs to be in the short term to mitigate the negative shocks. The factors which affect Zimbabwean competitiveness in the short-run are imports, exports, yield, and SADC cotton exports. In the long run all factors except SADC other exports have an effect on its competitiveness.

To improve the competitiveness of cotton, the study recommends the smoothening of the production and exportation processes. Zimbabwe needs to increase production at lower costs to match the regional commodity prices. There is a need to capitalize especially the bigger A2 farms through drilling of boreholes, construction of dams and provision of irrigation pipes to

reduce effects of erratic rains and draughts. This will further improve yield and the quality of cotton lint and seed presented on the international market.

To enhance production and ensure improved competitiveness, the government needs to re-evaluate supply-side policies which include government subsidies, export-oriented taxes, and rebates. These supply-side policies can directly reach the anticipated beneficiaries and lead to quick results in improving competitiveness. However, distortions can easily mar their effectiveness. There is, therefore, a need for a direct national database linkage with the farmers to remove any political influence within the process.

Processes that can lower or discourage the importation of goods through import substitution need to be encouraged through the monitoring of the country's demand for cotton and ensuring prices offered to producers are competitive enough within the local market.

The study focused on understanding competitiveness at the macro level, there is a need to understand cotton's competitiveness at the micro level. This further assists policymakers to improve competitiveness at grassroots level.

REFERENCES

Alidou, M., Ceylan, F.R., & Ilbasmis, E. (2017). Trade and Revealed Comparative Advantage Measures: A Case of Main Export Commodities of Benin Republic. *Kastamonu University Journal of Faculty of Economics and Administrative Sciences, 18(1), 382-397.*

Bennett, M., Salm, A., & Greenberg, D. (2011). *Southern Africa's Cotton, Textile and Apparel Sector: A Value Chain Analysis.* Gaborone: USAID/Southern Africa. Retrieved December 17, 2021, from https://satradehub.org/images/stories/downloads/pdf/technical_reports/Technical%20Report%20-%20Textile%20Cotton%20and%20Clothing%20Value%20Chain%20Analysis.pdf

Esterhuizen, D. (2017). *Cotton Production and Consumption in Zimbabwe*. Pretoria: USDA Foreign Agricultural Service.

FAO. (2016). "Agriculture in Sub-Saharan Africa: Prospects and challenges for the next decade", in *OECD-FAO Agricultural Outlook 2016-2025*. Paris: OECD Publishing.

FAO. (2016). *Country Programming Framework for Zimbabwe 2016 to 2020*. Retrieved January 12, 2022, from http://www.fao.org/3/a-i6577e.pdf

Fertὸ, I., & Hubbard, J.L. (2002). *Revealed Comparative Advantage and Competitiveness in Hungarian Agrifood sectors Technology Foresight in Hungary*, IEHAS Discussion Papers, No. MT-DP - 2002/8, Budapest: Hungarian Academy of Sciences, Institute of Economics. Retrieved January 10, 2022, from https://www.econstor.eu/bitstream/10419/108046/1/MTDP0208.pdf

Gujarati, D.N. (2004). Basic Econometrics (4th ed.). New Delhi: McGraw-Hill Companies.

Gujarati, D.N., & Porter, D.C. (2009). Basic Econometrics (10th ed.). Singapore: McGraw- Hill International Editions Economics Series.

Harris, R.I.D. (1995). Using Cointegration Analysis in Econometric Modelling. Heartfordshir: Prentice-Hall/ Harvester Wheatsheaf.

Johansen, S. (1988). Statistical analysis of cointegrating vectors. *Journal of Economic Dynamics and Control, 12, 231-254.*

Kamoyo, M., Muranda, Z., & Chikuya, T. (2015). Agricultural export commodity participation, contract farming and rural livelihood in Zimbabwe: The case of cotton farming in Rushinga district. *IOSR Journal of Economics and Finance, 6(6), 110-120.*

Keyser, J.C. (2002). *The Costs and Profitability of Tobacco in Zimbabwe Compared to other Crops* (Health, Nutrition and Population (HNP) Discussion Paper, Economics of Tobacco Control Paper Number 1). Washington, DC: The World Bank.

Kharlamova, G., & Vertelieva, O. (2013). The International Competitiveness of Countries: Economic-Mathematical Approach. *Economics and Sociology 6(2):39-52.*

Levin, A., Lin C.F., & Chu, C.S.J. (2002). Unit root tests in panel data asymptotic and finite sample properties. *Journal of Econometrics*, *108(1), 1-24.*

Markusen, R.J., Melvin, R.J., Kaempter, H.W., & Maskus, E.K (1995). International Trade: Theory and Evidence (1th ed.). McGraw-Hill Inc.

Mosoma, K. (2004). Agricultural Competitiveness and Supply Chain Integration: South Africa, Argentina and Australia. *Agrekon, 43(1), 132-144.*

Mukarumbwa, P., & Mushunje, A. (2010). Potential of Sorghum and Finger Millet to Enhance Household food Security in Zimbabwe's Semi-Arid Regions: A Review. *Proceedings of the 2010 AAAE Third Conference/AEASA 48th Conference, September 19-23, 2010, Cape Town, South Africa.*

Mutambara, J., & Mujeyi, K. (2020). Enhancing competitiveness of Zimbabwe's cotton production under contract farming. *African Journal of Science, Technology, Innovation and Development, 1-9.*

Mutambatsere, E. (2008). Competitiveness and revealed comparative advantage in the SADC maize industry. *Proceedings of the 2007 Second International African Association of Agricultural Economists (AAAE) Conference, August 20-22, 2007, Accra, Ghana.*

Okereafor, G., Ogungbangbe, B.M., & Anyanwu, A. (2015). Positioning Nigeria for Global Competitiveness in the 21st Century: The Policy Imperatives*. International Journal of Management Science and Business Administration, 1 (10), 56-69.*

Poulton, C.., Davies, R., Matshe, I., & Urey, I. (2002). *A Review of Zimbabwe's Agricultural Economic Policies: 1980-2000* (ADU Working Papers 10922). Imperial College at Wye, Department of Agricultural Sciences.

Poulton, C., & Hanyani-Mlambo, B. (2009). *The Cotton Sector of Zimbabwe* (Africa Region Working Paper Series No. 122). Washington: World Bank.

Rajesh, P., Sethi, M., & Chaudhuri, S. (2016). Changing Paradigm in Trade Theories: A Review and Future Research Agenda. *Indian Journal of Science and Technology. 9(46), 1-6.*

Rugman, A.M., & D'Cruz, J.R. (1993). The Double Diamond Model of International Competitiveness: The Canadian Experience*. Management International Review*, *33, 17- 39.*

Stojčić, N., Benić, D., & Karanikić, P. (2014). Regional Determinants of Export Competitiveness in Croatian*. Zbornik Radova Ekonomskog Fakulteta u Rijeci, 32 (2), 193-212.*

Thorne, F. (2005). *Examining the Competitiveness of Cereal Production in Selected EU Countries*. (Working Papers 0507), Rural Economy and Development Programme, Teagasc.

Webber, C.M., & Labaste, P. (2010). B*uilding Competitiveness in Africa's Agriculture.* A Guide to Value Chain Concepts and Applications. New York: World Bank.

WEF. (2017). *The Africa Competitiveness* Report: Addressing Africa's Demographic Dividend, World Bank, African Development Bank, and Ministry of Foreign Affairs of Denmark. -10: 92-95044-44-4. World Economic Forum. Retrieved December 17, 2021, from https://www.afdb.org/en/documents/document/africa-competitiveness-report-2017-95417