

## **AGRICULTURE EXPORTS AND ECONOMIC GROWTH IN ZIMBABWE**

Mufaro Andrew Matandare

Faculty of Commerce, BA ISAGO University, Gaborone, Botswana  
P. Bag 149, Kgale Hill Postnet, Gaborone, Botswana

### **ABSTRACT**

This paper examined the relationship between agricultural export and economic growth in Zimbabwe. The study used time series data from 1980 to 2016. The theoretical model was specified in the spirit of Mankiw, Romer, & Weil (1992). Ordinary Least Square (OLS) methodology was adopted. The empirical findings in the study revealed that agricultural exports, labour, exchange rate and inflation rate have a statistically significant impact on economic progress in Zimbabwe. The paper recommended that government should redirect efforts to improve agricultural export in the process of economic growth in the country. The government should enhance the agricultural sector by giving incentives to the producers in the form of subsidization. To be able to compete in the foreign markets, local farmers should focus on production of food products as well as improve product quality. Furthermore, the government should revive the agro-based industries to enhance backward and forward linkages.

**Keywords:** Agriculture, Agriculture exports, RGDP, Economic growth, Zimbabwe

### **1. INTRODUCTION**

The relationship between economic growth and exports occupies the center stage with respect to policies geared for development. Economic Growth is possibly the leading goal of policy makers worldwide (Hernandez, 2011). It is a conventional wisdom among academics and policy makers that exports are key factor in stimulating economic growth in emerging nations (Dreger, 2011). The concern borders on the fact that most developing nations are profoundly dependent on exports of primary commodities to developed nations (UNCTAD, 2005). The economic success of the Asian NICs (newly industrializing countries) has prompted all countries in the region to pursue aggressive export promotion strategies, and some countries have indeed achieved rapid economic growth.

One of the commonly used methods to achieve economic growth is export promotion due to its witnessed success in Asian newly industrializing countries (NICs), (Krueger 1985). However,

the Marxist ideology viewed trade as a mechanism for developed nations to exploit developing nations. The answers to the primary question whether export growth causes economic growth remains obscure. Although further theoretical insights would be important, empirical analyses is needed to explore and better appreciate the relationship between economic growth and exports, (Ram, 1985).

Approximately Z\$13.4 billion is produced by agriculture exports annually in Zimbabwe. 40% of Zimbabwe's foreign exchange earnings are realized from exports of agricultural products. It is the economic sector that mostly contributes to Zimbabwe's involvement in international trade, (ZimTrade, 2016). Related agricultural activities include trade and investment opportunities in processing of this sector's output. Major export crops in Zimbabwe (that is cotton and tobacco) and horticultural produce (fruits and flowers) accounted for over 60% of export receipts annually, (Saungweme and Matandare, 2014). Other major agricultural exports from Zimbabwe include: tea, sugar, coffee, vegetables, maize, seeds, animals, birds, dairy products, beef, poultry and wildlife meat, (ZimTrade, 2016). Despite the steep decline in agricultural output in Zimbabwe, over 80 percent of the country's population still live in rural areas and are directly or indirectly linked with the agricultural sector as their source of livelihood.

Agriculture is the backbone of the Zimbabwean economy, has strong forward and backward linkages with the rest of the economy, provides employment and income for 60-70 percent of the population and supplies 60 percent of the raw materials required by the industrial sector. Of note is the fact that the Zimbabwean agriculture sector remained continuously engaging in reformation since independence in 1980. It was considered as a leading sector in the early time period but due to the political, social, environmental and climate conditions its production yield has gone down gradually, (Maiyaki, 2010). While many studies have shed some light and brought the relationship of export and growth to the fore of academic discussion, the literature is still very much limited in Zimbabwean context especially in recent years. Moreover, most of the studies debating on the export led growth hypothesis were done in developed countries; few have been done in developed nations including Africa.

This study examines the contribution of agricultural exports to economic growth in Zimbabwe. The importance of the study can be rationalized from the fact we are applying the most recent data to explore the importance of agricultural exports for Zimbabwe's economic growth. Also, this work could serve as a roadmap for further solutions to problems of multilateral trade in the agricultural domain. As, Zimbabwe is an agricultural economy, development of the agricultural sector is the main source for policy makers to implement appropriate policies towards the sector thus ensuring economic growth and welfare of all.

### **1.1 Objectives of the study**

The main objective of this study is to evaluate the effects of agricultural exports on economic growth in Zimbabwe as well as to recommend some policy implications from the findings.

### **1.2 Hypothesis**

H0: Agriculture export has a positive effect on economic growth.

H1: Agriculture export does not have a positive effect on economic growth.

## **2. LITERATURE REVIEW**

### **2.1 Theoretical literature review**

Most of the less developed nations produce primary products, instead of secondary and tertiary activities. Subsequently, forex revenue from these primary exports play a very important role in these countries, and also represents a substantial share of their gross domestic product, (GDP), (Todaro and Smith 2011). Over the past few decades, agricultural products exports have played a fundamental role in the economic progress of many developing nations. Exports of agricultural products continue to be the most principal source of forex most of Sub-Saharan African nations (Gilbert, 2009).

Advocates of ALG supports that agriculture investment and accompanying infrastructure and institutions developments are an economic progress prerequisites, (Schultz 1964; Timmer 1995). Johnston and Mellor (1961) propose that agriculture contributes to economic progress through five inter-sectoral linkages. One of the contributions identified was the supply of forex from agricultural exports to finance import of capital as well as intermediate goods.

In contrast to the ALG opinions, the advocates of the contrary viewpoint suggests that the agricultural sector does not have strong linkages to other sectors and lack suitable innovative structure needed for nurturing increased productivity and export growth (Lewis 1954; Hirschman 1958; Jorgenson 1961; Fei and Ranis 1961). In a theoretical analysis, Matsuyama (1992) uses the comparative advantage argument to contest the claim that agricultural productivity is an engine of economic growth.

### **2.2 Empirical Literature review**

Levin and Raut (1997) explored the effect of primary commodity and manufactured exports on economic growth. The study concluded that manufacturing exports were the main source of economic growth and the exports of primary products had a negligible effect.

Dawson (2005) examined contribution of agricultural exports to growth in developing nations. The first model was based on agricultural production function, including agricultural and non-agricultural exports. The second model included agricultural and non-agricultural where each sector was sub divided into exports and non-export sector. Fixed and Random effects were estimated in each model using a panel data of sixty two nations for the period 1974-1995. The study provided evidence from less developed countries that supported theory of export led growth and suggested that the export promotion policies should be balanced.

Nadeem (2007) provided the empirical analysis of the dynamic influences of economic reforms and liberalization of trade policy on the performance of agricultural exports in Pakistan. The author examined the effect of both domestic supply side factors and external demand on the performance of agricultural exports. The major finding of the study was that export diversification and trade openness contributed more in agriculture domestic side factors performance. The results of the study suggested that agricultural exports performance is more elastic to change in domestic factors.

Sanjuan-Lopez and Dawson (2010) estimated the contribution of agriculture exports to economic growth in under developed countries. They estimated the relationship between Gross Domestic Product and agrarian and non-agrarian exports. The results of the study indicated that there existed long run relationship. The study suggested that the poor countries should adopt balanced export promotion policies but the rich countries might attain high economic growth from non-agricultural exports.

### **3. METHODS**

#### **3.1 Theoretical framework**

This study follow Mankiw, Romer, & Weil (1992) who used the theoretical framework as guided by the derivation of the Solow growth model with Harrod-neutral technological progress. We assume that the aggregate production function is given by the Solow (1957) growth model:

$$Y = f[K, L, t] \tag{1}$$

Where  $Y$ ,  $K$ ,  $L$  and  $t$  are respectively, total output, capital, labour and technological progress. When technological progress is Harrod-neutral, equation (1) is stated as:

$$Y(t) = f[K(t), A(t)L(t)] \tag{2}$$

Where  $A(t)$  is the state of the art, “knowledge” or the “effectiveness of labour” (Romer 2006). Faridi (2012), Abrar ul haq et al. (2015), and Ijirshar (2015) considered agriculture export as an important variable which affects total output. Therefore we add non-food export [ $G(t)$ ] and food export [ $F(t)$ ] to the production function as follows:

$$Y(t) = f[K(t), A(t)L(t), G(t), F(t)] \quad (3)$$

Anderson and Jordan (1968); and Ram (1986), Hwa (1988), Barro and Lee (1994), Awan and Alam (2015) included exchange rate (E), interest rate (R) and inflation rate (P) as control variables. These are captured by vector variable  $X(t)$  in (4) as follows:

$$Y(t) = f[K(t), A(t)L(t), G(t), F(t), X(t)] \quad (4)$$

### 3.2 Econometric model

Uremadu and Onyele (2016) guide the following modified production function which is to be estimated:

$$Y_t^* = \beta_0 + \beta_1 K_t^* + \beta_2 L_t^* + \beta_3 G_t^* + \beta_4 F_t^* + \beta_5 E_t^* + \beta_6 R_t^* + \beta_7 P_t^* + U_t \quad (5)$$

Where the variables with asterisks (\*) are the transformed logged variables. Logarithms help to solve the problem of heteroscedasticity and coefficients obtained in the estimated results can be readily read as elasticities.  $\beta_0$  is constant.  $\beta_1$  to  $\beta_7$  are the coefficients to be estimated. Taking the natural logs on both sides of the equation also rule-out the differences in the units of measurements for our variables.

### 3.3 Source and definitions of Data

Time series data on agriculture export and economic growth covering the time period from 1980 to 2013 is used. The secondary data is collected from World Development Indicators (WDI) databank. The variables that are included in this paper are Real Gross Domestic Product per capita ( $Y$ ), Non-food export ( $G$ ), Food export ( $F$ ), Labour force participation ratio ( $L$ ), Gross fixed capital formation ( $K$ ), Exchange rate ( $E$ ), Lending interest rate ( $R$ ) and Inflation rate ( $P$ ). Data is processed using E-views 8 econometric package.

## 4. RESULTS AND DISCUSSION

Table 1 contains descriptive statistics for the indicators of non-food exports, food exports, real gross domestic product (RGDP) and other selected macroeconomic variables. It can be seen from Table 1 that all the variables are positively skewed and to the right except capital. Also, all the

series were normally distributed as could be seen by their probability values. Thus, this buttresses the use of the least square approach as against all other estimation approach.

**Table 1: Descriptive statistics**

	Y	K	L	G	E	R	P	F
Mean	1073.3	14.3	5284671	9.5	3.16	343.0	28229.6	2.737
Median	1159.6	14.8	48865120	8.9	0.02	36.5	221.4	2.734
Maximum	1342.5	24.6	7812529	23.1	2.08	1616.5	44766.7	2.764
Minimum	590.7	2.0	319.3	3.8	0.0006	11.7	2.3	2.706
Std. Dev.	219.4	6.0	14.2	4.0	6.2	504.1	9683.0	0.017
Skewness	0.7	-0.6	0.3	1.4	1.7	1.3	3.4	0.027
Kurtosis	2.1	2.7	1.6	5.5	4.5	3.3	13.3	1.558
Jacque-Berra	3.9	2.1	3.5	21.8	21.5	0.9	236.5	3.207
Probability	0.141	0.034**	0.017**	0.000***	0.000***	0.004***	0.000***	0.201

**Source:** Author’s computations E-views 8. Key: \*\*\* and \*\* denote significance at 1% and 5% respectively.

The result of the ordinary least square regression (OLS) method is presented in Table 2. The linear function best fit the model as it has four independent variables with significant effects on real GDP per capita. The R-squared value of 0.892828 implies that 89.28 percent of total variance in GDP is explained by the regression equation. Coincidentally, the goodness of fit of the regression remained high after adjusting for the degrees of freedom as indicated by the adjusted R-squared which is 0.866959 or 86.70 percent. F-statistic of 94.51338, which is the measure of the joint significance of the explanatory variables, is found to be statistically significant at 1 percent as indicated by the corresponding probability value (0.000000).The Durbin-Watson statistic of 1.925875 implies absence of autocorrelation in the model, the Durbin-Watson statistic 1.9 is higher than R-squared of 0.89 this indicate that the model is non-spurious and therefore can produce meaningful results.

**Table 2: Regression results, Dependent Variable: Y**

Dependent Variable: Y, Sample: 1980 2016

Method: Least Squares, Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-685.2177	373.0499	-1.836799	0.0765*
K	0.014816	0.031138	0.475810	0.6378
L	-25.76595	14.15220	-1.820632	0.0790*
G	0.004032	0.055503	0.072644	0.9426
F	398.3720	216.1226	1.843268	0.0755*
E	-0.009600	0.004463	-2.150865	0.0400**
R	-0.029819	0.044398	-0.671627	0.5071
P	-0.044279	0.009464	-4.678460	0.0001***
R-squared	0.892828	Adjusted R-squared	0.866959	
F-statistic	94.51338	Durbin-Watson stat	1.925875	
Prob(F-statistic)	0.000000			

**Source:** Author’s computations using E-views 8. Key: \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% respectively.

As per expectation the GDP per capita of Zimbabwe is positively affected by agriculture exports, notably food exports which had a statistically significant influence. However non-food exports had a statistically insignificant influence. The results indicate that any positive increase in food exports results in a significant increase in the GDP per capita. These results could be explained by the exports led development prospective for Zimbabwe. This result is also supported by Uremadu and Onyele (2016)’s findings that food exports positively affected real GDP. Results also postulate that capital is insignificant but unemployment has a negative significant influence on GDP and its increase affects GDP negatively.

Exchange rate and inflation rate are significant and affected real GDP negatively by 0.0096 and 0.0443 respectively. A 5% change in exchange rate result in a 0.96% decline in GDP while a unit change in inflation rate caused real GDP to decrease by 4.4%. The plausible reason why agricultural production and economic performance of Zimbabwe have deteriorated overtime could be due to the prevailing unfavorable domestic prices, thereby inhibiting domestic production. On the other hand, interest rate does not play an important role. This in agreement

with a priori expectations in that unfavorable interest rates that do not enable farmers to have access to funds would invariably affect domestic production of agricultural exports.

## **5. CONCLUSION**

The present study is an attempt to examine the contribution of agricultural exports to economic growth empirically. The empirical analysis is based on the time series econometrics. It is found in the current study that capital play a minimum role in economic growth. The present research further concludes that food exports have a positive effect on economic growth. The economic growth rises as the agricultural exports increases. Further, we have found that interest rate have insignificant and negative influence on economic growth. However, labour, exchange rate and inflation rate have negative but significant effect on economic growth.

On the basis of above findings, it is concluded that agricultural exports are vital for Zimbabwe's economic growth and development. We suggest that government should take initiatives to promote agriculture exports. The exports of agricultural products may be enhanced by giving incentives to the producers in the form of subsidization. In order to compete in the international trade markets, local producer should focus on production of food exports and improve the quality of their products. Besides this, government should revive agro-based industries in order to foster backward and forward linkages. For sustainability of agricultural crops production and hence agricultural exports, it is necessary to start various reforms in the sector i.e. reforms about crops production, extension services, basic infrastructure and mechanization.

## **ACKNOWLEDGEMENTS**

I am grateful and acknowledge the remarks and propositions made by Dr. B. Muyambiri. This research is supported and funded by BA ISAGO University therefore I take this opportunity to thank BA ISAGO University for the support.

## **AUTHOR'S INFORMATION**

Mufaro Andrew Matandare is an Economist, currently working as a Lecturer at BA ISAGO University in Gaborone, Botswana. Mufaro holds a BSc. (Hons) Economics and a MSc. Economics from the University of Zimbabwe. He is currently a PhD Economics scholar at the University of Botswana. His research field is in macroeconomics and development issues. His specific research interests include environmental economics, agriculture economics, public sector economics, monetary theory and practice, monetary and fiscal policy coordination in both developing and developed nations. In his spare time, Mufaro watches soccer, plays social soccer and reads a wide range of books as well as follow current business and macroeconomic affairs at local and global levels.

## REFERENCES

- [1] Abrar Ul haq, M. *Agriculture export and economic growth: A case study of Pakistan*. MPRA paper no 6749, pp88-96, 2015.
- [2] Anderson, L. and Jordan, J. "Monetary and fiscal actions: A test of their relative importance to economic stabilization." *Federal Reserve Bank of St Louis review*, pp11-24, 1968.
- [3] Awan, A. G. and Alam, A. "Impact of agriculture productivity on economic growth: A case of Pakistan." *Industrial engineering letters*, Vol 5(7), 2015.
- [4] Balassa, B. "Exports and Economic growth: Further evidence." *Journal of Development Economics* , pp181-189, 1978.
- [5] Barro., R. J. and Lee, J. "Sources of economic growth." *Carnegie-Rochester conference series on public policy*, pp1-46, 1994.
- [6] Dawson, P.J. "Agricultural exports and economic growth in less developed countries." *Agricultural Economics*, Vol33, 145-152, 2005.
- [7] Dreger, C. *A further examination of the export-led*. Oder: European University Viadrina Frankfurt, 2011.
- [8] Faridi, M. Z., "Contribution of agricultural exports to economic growth in Pakistan." *Journal of commerce and social sciences*, Vol6(1), pp133-146, 2012.
- [9] Hirschman, A. *The Strategy of Economic Development*, New Haven: Yale University Press, 1958.
- [10] Hwa, E. C. "The contribution of agriculture to economic growth, some empirical evidence." *World development*, Vol 16(11), pp1329-1339, 1988.
- [11] Ijirshar, V. U. "The empirical analysis of agricultural exports and economic growth in Nigeria." *Journal of development and agricultural economics*, Vol 7(3), pp113-122, 2015.
- [12] Johnston, B. and Mellor, J. "The role of agriculture in economic development." *American Economic Review*, Vol51 (4), pp566-93, 1961.
- [13] Jorgenson, D. "The development of a dual economy." *Economic Journal*, Vol282, pp309-334.,1961.

- [14] Krueger, A. *The experience and lessons of Asia super exporters*. In Corbo, V., Krueger, A.O. and Ossa, F.(eds). *Eport-oriented development strategies: The Success of Five Newly Industrialized*, 1985.
- [15] Kwa and Bassoume, *Exploring the linkages between agricultural exports and sustainable development*, Ecofair trade dialogue, Discussion Paper No. 2, pp. 1 – 38, 2007.
- [16] Levin, A. and Raut, L.K. “Complementarities between exports and human capital in economic growth: evidence from the semi-industrialized countries.” *Economic Development and Cultural Change*, Vol46, 155-174, 1997.
- [17] Lewis, W. A. “Economic development with unlimited supplies of labour.” *The Manchester School*, Vol22 (1), 139–91, 1954.
- [18] Maiyaki, A. A. “Zimbabwe’s agricultural industry.” *African Journal of Business Management*, Vol4(19), pp4159-4166, 2010.
- [19] Matsuyama, K. 1992. “Agricultural productivity, comparative advantage, and economic growth.” *Journal of Economic Theory*, Vol58 (2), pp317–34, 1992.
- [20] Nadeem, M. *Pakistan Agricultural Export Performance in the Light of Trade Liberalization and Economic Reforms*, Working Paper 45854, University of Balochistan, Commerce Department, 2007.
- [21] Ram, R. (1985). *Exports and Economic Growth: Some Additional Evidence*. University of Chicago Press, 1985.
- [22] Ram, R. “Government size and economic growth: A new framework and some evidence from cross section and time series data.” *American economic review*, Vol 76, pp191-203, 1986.
- [23] Saungweme, T and Matandare. M. “Agricultural expenditure and economic performance in zimbabwe (1980-2005).” *Int.J.Eco. Res.*, 2014, Vol5i5, 50 – 59, 2014.
- [24] Schultz, T. W. *Transforming Traditional Agriculture*. New Haven: Yale University Press, 1964.
- [25] Timmer, C. P. “Getting agriculture moving: Do markets provide the right signals?” *Food Policy*, Vol20 (5), pp455–72, 1995.
- [26] Todaro, M. P., and Smith, S. C. *Economic Development*, 11th edition. USA: Addison Wesley, 2011.

[27] UNCTAD. *Policy issues in international trade and commodities*, Study series no 19. UNCTAD, 2005.

[28] ZimTrade. *The National Trade Development and Promotion Organisation of Zimbabwe*, Zimbabwe, 2016.

### **ABBREVIATIONS AND ACRONYMS**

ALG – Agriculture Led Growth

NICs – Newly Industrializing Countries

OLS – Ordinary Least Square

RGDP – Real Gross Domestic Product

UNCTAD – United Nations Conference on Trade and Development

WDI – World Development Indicators