

2005: International Conference on International Aid, Trade & Development in Africa – A Search for a Development Paradigm, Addis Ababa, Ethiopia.

The Impact of Trade on Africa: Empirical Evidence from Zimbabwe

By

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ABSTRACT

The research addresses empirically the Export-led Growth Hypothesis (ELGH) using Zimbabwe as a laboratory test ground. This research work attempts to provide some evidence in this regard by examining the influence of trade on economic growth in the economy and ascertaining if the regressors utilised are good predictors of growth. Ordinary Least Squares (OLS) method is resorted in order to estimate the specified equations used in the study. The time-series data utilized runs from 1991 to 2003. The results of the study confirm the existence of the export-led growth model in Zimbabwe. In the face of continual instability in its export receipts, we recommend that fundamental economic and political restructuring should be embarked upon in order to address and subsequently reverse the current situation that Zimbabwe finds itself. Finally, it is envisaged that the results arising from this study would be useful to the other economies of Africa, especially in their export drive.

I. Introduction

Development economists have long recognized the potential impact of export-led strategy in the growth process of national economies. Indeed, several empirical studies have consistently demonstrated that economies with a favourable export growth record also enjoy higher rates of economic growth. Other studies have also established additional effects of a quantitative jump in exports to the economy of a nation, besides promoting economic growth, Mathew [1] and Ogbokor [2]. The Export-led Growth Hypothesis (ELGH) postulates that export expansion is one of the key determinants of growth. It maintains that the overall growth of countries does not only depend on the amount of labour and capital within the economy, but also through export expansion. In fact, exports are perceived as an “engine of growth”. Existing studies on the issue under investigation for the economy of Zimbabwe have been scanty and qualitative in nature. Consequently, the cardinal objective of this study was to determine the impact of trade on the economy of Zimbabwe, by considering a different specification of the ELGH model. The rest of the paper is structured in the following sequence. Section II focuses on literature review, while Section III presents the method of investigation and also discusses the model as well as the data used in the study. Discussions of the statistical results are shown in Section IV. Finally, conclusion and policy recommendations of the study as well as direction for further research are highlighted in Section V.

II. Review of Related Literature

Over the years, lots of studies have attempted to establish the connection between exports and economic growth; a relationship popularly referred to in the literature as Export-Led Growth Hypothesis.

Lewis [3] explains that, in addition to the multiple functions, which exports perform in the process of economic growth, it is also much easier for a country to begin its process of economic development via exporting. He cautioned, however, that this foreign market is usually very small in the early stage of development. He maintained that, the unique role of exports as a development strategy combine to make exports an “engine of growth”. This is why historically, the genesis of economic development in virtually every country have been induced by an increase in exports.

In a similar fashion, Emery [4] investigated the relationship between exports and selected macroeconomic aggregates using regression methods. He observed the following results:

Firstly, the study indicates a very strong positive connection between exports and economic growth. Secondly, he noted that a 2% increase in a country's exports is likely to enhance its per capital real GNP to the tune of 1%.

Papanek [5] using data for 85 developing countries found a direct relationship between economic growth and the following selected macroeconomic variables that came under focus in the study: domestic savings, foreign aid, foreign private investment as well as other foreign inflows. The model used for the study also explained about 37% systematic variation in economic performance.

The results obtained by Mathews [6] using the British economy as a laboratory test ground reinforces the work of Papanek. He observed a positive relationship between productivity, growth and trade.

Ram [7] in his study of India, using time-series data running from 1950 to 1971 investigated the export-led growth hypothesis. Relying on double-log transformation regression equations, he noted that a 1% increase in export earnings is associated with a 0.73% jump in domestic product.

Fajana [8] observed a strong positive relationship between export and output changes. He also noted that exports generally had a greater impact on the economic performance of Nigeria for the period under investigation vis-à-vis foreign capital inflow. He concluded that exports constitute a great source of growth for the Nigerian economy.

Sosa [9] investigated the connection between external debt and the Philippines' economic growth. He also wanted to see if developing countries would be better off in the absence of external debt in their quest for economic development. Using a simple version of the Harrod-Domar growth model, the study found a direct relationship between foreign capital and economic growth of the Philippines.

Aslam [10] using multiple regression models determined the effect of foreign capital inflows on domestic savings and investment in Pakistan. He disaggregated foreign capital inflows into Public capital inflows and Private capital inflows. The following results were obtained: Private capital inflow was found to have minimal impact on domestic savings, while it exhibited direct relationship with investment. Similarly, Public capital inflow was observed to have negligible effect on investment.

Ogbokor [11] investigated the macroeconomic impact of oil exports on the economy of Nigeria. Utilizing the popular OLS technique, he observed that export is undeniably a critical source of growth for the Nigerian economy. He also found that a 10% increase in oil exports would lead to a 5.2% jump in economic growth. He concluded that export-oriented strategies should be given a more practical support by the relevant authority.

Akerele [12] relying on appropriate quantitative techniques identified sources of instability in export earnings for the Nigerian economy for the period 1980-1997. He observed that political as well as economic factors provided sources of instability in Nigeria's export earnings. The influence of political factors is not surprising, since the period of the study coincided with the imposition of various sanctions on Nigeria for failure to adopt western-style democracy.

Other studies reviewed Sharer [13] and Frankel *et al.* [14] also lend credence to the export-led growth paradigm.

III. Materials and Method of Investigation

Data Sources: The data for the study were obtained from a combination of various sources. These sources include World Bank debt tables and National Accounts data published by the World Bank, Washington D.C., the International Financial Statistics Yearbook and Government Finance Statistics Yearbook published by the International Monetary Fund. Other sources utilized are United Nations Yearbook of National Accounts and the various statistical publications of the Central Bank of Zimbabwe.

Method of Research: As a result of protracted economic mismanagement of the economy coupled with unhealthy political manipulation Zimbabwe, which used to be a leading economy at one time in the southern part of Africa is presently finding it increasingly difficult to provide foreign exchange needed for the importation of capital goods, intermediary inputs and raw materials. Zimbabwe's exports mainly primary goods of mining and agricultural origin have also been adversely affected by the country's deteriorating terms-of-trade. Of concern for this study is the functional relationship between Zimbabwe's economic growth and selected macroeconomic data as well as the magnitude and pattern of its economic growth and development.

In the light of this, the study uses time-series data covering the period 1991 to 2003. In order to identify and analyse the important factors, which have contributed to the fluctuation in Zimbabwean growth cum development the study utilised the Ordinary Least Squares (OLS) method of estimation. The double-log transformations for each of these models are also specified and fitted. The prime objective of generating the natural log transformations is to determine the degree of sensitivity of the dependent variables to changes in the explanatory variables. The macroeconomic data used are highly aggregative, since the study was concerned with macroeconomic analysis.

Model Building: Using the knowledge gained from the surveyed literature and recognizing the constraints imposed by data availability, the general functional model relied upon in carrying out the study is implicitly stated as follows:

$$BX_t = f(EX_t, EX_{t-1}, IM_t, IM_{t-1}, NE_t)$$

Where:

BX= Economic growth

EX= Export variable

EX_{t-1}= Lagged export variable

IM= Import variable

IM_{t-1}= Lagged import variable

NE= Net export variable

More precisely, the variable to the left-hand side of the equality symbol represents the dependent variable, while those to the right-hand side are referred to technically as explanatory variables. Furthermore, if we take the derivative of the functional model with respect to each of the explanatory variables, the following results are expected:

$$\frac{\partial(BX)}{\partial(EX)} > 0; \frac{\partial(BX)}{\partial(EX_{t-1})} > 0; \frac{\partial(BX)}{\partial(IM)} < 0;$$

$$\partial(\text{EX}) \quad \partial(\text{EX}_{t-1}) \quad \partial(\text{IM})$$

$$\frac{\partial(\text{BX})}{\partial(\text{IM}_{t-1})} < 0; \quad \frac{\partial(\text{BX})}{\partial(\text{NE})} \geq 0$$

The results of the partial derivatives obtained above are interpreted in the following manner: We expect economic growth to be positively related to export and lagged export variables. Similarly, we expect economic growth to decrease as a result of an increase in import and lagged import variables. Changes in net exports could have either a positive or no effect on economic growth. On the basis of the general model, the following linear equations are specified and estimated bearing in mind the core objective of the study:

1. $\text{BE}_t = Z_0 + Z_1\text{EX}_t + U_t$
2. $\text{BE}_t = Z_0 + Z_1\text{EX}_{t-1} + U_t$
3. $\text{BE}_t = Z_0 + Z_1\text{IM}_t + U_t$
4. $\text{BE}_t = Z_0 + Z_1\text{IM}_{t-1} + U_t$
5. $\text{BE}_t = Z_0 + Z_1\text{NE}_t + U_t$
6. $\text{BE}_t = Z_0 + Z_1\text{EX}_t + Z_2\text{IM}_t + U_t$

Natural logarithmic equations used in the study are also specified as:

7. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{EX}_t + U_t$
8. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{EX}_{t-1} + U_t$
9. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{IM}_t + U_t$
10. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{IM}_{t-1} + U_t$
11. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{EX}_t + Z_2\ln\text{IM}_t + U_t$
12. $\ln\text{BE}_t = Z_0 + Z_1\ln\text{EX}_t + Z_2\ln\text{EX}_{t-1} + Z_3\ln\text{IM}_t + Z_4\ln\text{IM}_{t-1} + U_t$

IV. RESULTS AND DISCUSSION

In this study, we have tried to test empirically the validity of the proposition that fluctuations in economic growth are assumed to be influenced to a considerable extent by factors such as exports, net exports, imports, etc. Various equations were estimated with several explanatory variables. We report only the best fitting regression equations. The Ordinary Least Squares results were obtained through the use of a software package known as Statistical Package for Social Sciences version 8. The study was also concerned with isolating the effects of changes in the explanatory variables on economic performance, hence the use of natural logarithmic equations. The use of the asterisk symbol (*) implies that the variable is significant at 5% level. Estimation of linear equation for economic growth yielded the following results with t-ratios supplied in parentheses:

1. $\text{BE} = 89000.481 + 2.673\text{EX}$
(1.202) (1.535)
 $R^2 = 0.176$ $R^{-2} = 0.102$ $D-W = 0.453$
2. $\text{BE} = 109653.65 + 1.336\text{EX}_{t-1}$
(1.336) (0.720)

$$R^2=.049 \quad R^{-2}=-.046 \quad D-W=.276$$

$$3. \text{ BE}=57038.090+3.210\text{IM}$$

$$(0.694) \quad (1.759)$$

$$R^2=0.219 \quad R^{-2}=0.149 \quad D-W=0.412$$

$$4. \text{ BE}=85681.331+1.779\text{IM}_{t-1}$$

$$(0.910) \quad (0.884)$$

$$R^2=.072 \quad R^{-2}=.020 \quad D-W=.282$$

$$5. \text{ BE}=170902.36-1.762\text{NX}$$

$$(2.773) \quad (-0.214)^*$$

$$R^2=0.004 \quad R^{-2}=-0.086 \quad D-W=0.144$$

$$6. \text{ BE}=29900.868-4.391\text{EX}+7.813\text{IM}$$

$$(0.308) \quad (-0.574) \quad (0.948)$$

$$R^2=0.244 \quad R^{-2}=0.093 \quad D-W=0.339$$

In all the above six equations, we observed that the coefficients of export, lagged export, import, lagged import are positively signed, except in equations 5 and 6 where export and the net export variables came out with negative signs. Only the net export variable is significant at 5% level despite that, this variable is negatively signed. Therefore, net export is the only regressor, which appears to offer an explanation to the growth process. Overall, the performance of the economic growth equation is highly unsatisfactory with the regressors explaining only about 2% of the fluctuation in economic growth. We have also estimated the economic growth equation in logarithmic form, which yielded the following results:

$$7. \ln\text{BE}=1.845+.966\ln\text{EX}$$

$$(0.794) \quad (4.217)^*$$

$$R^2=0.618 \quad R^{-2}=0.583 \quad D-W=0.479$$

$$8. \ln\text{BE}=2.549+0.874\ln\text{EX}_{t-1}$$

$$(0.787) \quad (2.768)^*$$

$$R^2=0.434 \quad R^{-2}=0.377 \quad D-W=0.369$$

$$9. \ln\text{BE}=0.391+1.089\ln\text{IM}$$

$$(0.152) \quad (4.357)^*$$

$$R^2=0.633 \quad R^{-2}=0.600 \quad D-W=0.393$$

$$10. \ln\text{BE}=0.936+1.014\ln\text{IM}_{t-1}$$

$$(0.257) \quad (2.901)^*$$

$$R^2=0.457 \quad R^{-2}=0.403 \quad D-W=0.311$$

$$11. \ln\text{BE}=0.137-0.201\ln\text{EX}+1.311\ln\text{IM}$$

$$(0.039) \quad (-0.112) \quad (0.656)$$

$$R^2=0.634 \quad R^{-2}=0.560 \quad D-W=0.386$$

$$\begin{aligned}
12. \ln BE &= 0.292 - 1.466 \ln EX - 1.094 \ln EX_{t-1} \\
&\quad (0.072) \quad (-0.833) \quad (-.676) \\
&\quad + 3.646 \ln IM - 2.714 \ln IM_{t-1} \\
&\quad (1.584) \quad (-.014) \\
R^2 &= 0.766 \quad R^2 = 0.633 \quad D-W = 1.429
\end{aligned}$$

The logarithmic results displayed in equations 7 to 12 remarkably improved upon those of equations 1 to 6. It is apparent from equation 7 that the coefficient of the export variable is statistically significant at 5% level with positive sign suggesting that higher exports are associated with higher economic performance. It explains about 62% of the variation in the growth process. Similarly, a 1% increase in exports is expected to induce a corresponding jump in economic activities. In equation 8, lagged export variable is positive as expected and significant at 5% level. This regressor explains over 43% of the variation in economic performance. A 1% increase in lagged export will lead to 0.9% jump in economic activities. In equation 9, the import variable is positively signed and significant at 5% level. In particular, this variable accounted for over 63% of the variation in economic growth. A 1% increase in import is expected to generate approximately 1.1% in economic growth. In equation 10, the coefficient of the lagged import variable is positive and significant at 5% level. Only about 46% of the variation in economic growth is explained by a change in the regressor. A 1% increase in lagged import variable will lead to a similar rise in economic growth. In equation 11, the export and import variables are considered. These two variables are statistically insignificant at 5% but taken together they explained about 56% of the variation in economic growth. All the explanatory variables considered in equation 12 failed the significance test at 5% level and accounted for about 63% of the systematic variation in economic growth. Their coefficients assumed negative values except for that of import.

So far, our results and discussion enable us to infer that the foreign sector of the economy of Zimbabwe is weakly linked with the rest of its economy. All the variables considered appear to be poor predictors of growth. This is not surprising if one considers developments in Zimbabwe, especially in the past six years or so. In the face of land grabbing and unhealthy political manipulation the government of Zimbabwe is facing increasing international isolation and criticism being engineered by the West and their allies. As a result of this, the government of Zimbabwe is increasingly finding it difficult to obtain sufficient revenue to finance the importation of essential inputs needed for the smooth operations of her economy. This situation is anti-developmental.

V. Concluding Comments

The export sector of the Zimbabwean economy experienced a dramatic downturn in the last six years or so. Indeed, export receipt has been on the decline in the face of international isolation, economic as well as political sanctions. It is possible that the problem of simultaneous equation biased cropped up in the estimated equations used in the study as a result of the method relied upon in this research; nevertheless the study has succeeded in some ways in providing evidence on the existence of the export-led growth model for the Zimbabwean economy. In the face of increasing international sanctions, it is suggested that the government of Zimbabwe should focus on policies that will assist towards reversing the current situation of the country.

REFERENCES

1. Mathews, F.O., 1973. Foreign trade and British economic growth. *Scottish J. Political Econ.*, 20: 195-198.
2. Ogbokor, C.A., 2002. Investigating sources of economic growth by regression methods. *J. Development Alternatives and Area Studies*, 21: 187-190.
3. Lewis, W.A., 1966. *Some Aspects of Developing Nations*, New York: Oxford, pp: 39-41.
4. Emery, R.F., 1967. The Relation of Exports and Economic Growth. *Kyklos*, 20: 470-480.
5. Papanek, G.F., 1972. The effect of aid and other resource transfers on savings and growth in less developed countries. *The Economic J.*, 46: 935-940.
6. Mathews, F.O., 1973. Foreign trade and British economic growth. *Scottish J. Political Econ.*, 20: 195-200.
7. Ram, M., 1976. Trade-an engine of economic growth: The case of India during the planning period. *The Indian J. Econ.*, 56: 401-410.
8. Fajana, O., 1979. Trade and growth: The Nigerian experience. *World Development*, 7: 73-75.
9. Sosa, C.M., 1986. External finance in the economic development of the Philippines. *The Central Bank Rev.*, 38: 28-32.
10. Aslam, N., 1987. The impact of foreign capital inflows on savings and investment: The case of Pakistan. *Pak. Develop. Rev.*, 26: 787-788.
11. Ogbokor, C. A., 2001. Oil and economic growth: An econometric analysis. *J. Develop. Alternatives and Area Studies*, 20: 124-130.
12. Akerele, A.O., 2001. Nigeria's export trade: Instability and forecast. *J. Development Alternatives and Area Studies*, 20: 64-67.
13. Sharer, R., 1999. Trade: An engine of growth for Africa. *Finance and Development*, 36: 26-29.
14. Frankel, J.A. and D. Romer, 1999. Does trade cause growth? *American Econom. Rev.*, 89: 379-399.