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Cover Masuka[1], M. Chipumuro[2], Fungai H. Mudzengerere[3], Andrew T. Chigumira[4]

[1]Mathematics and Statistics, Ministry of Primary and Secondary Education, Mutare, Zimbabwe
[2]Mathematics and Computer Science, Great Zimbabwe University, Masvingo, Zimbabwe
[3]Research, Monitoring and Evaluation, World Education/Bantwana, Harare, Zimbabwe
[4]Economics and Management of Business, Ministry of Primary and Secondary Education, Mutare, Zimbabwe

(ZIMBABWE)

E-mails: covermasuka@gmail.com; amaimusara@yahoo.co.uk; fmudzengerere@gmail.com

ABSTRACT

The research aim to empirically investigate the impact of exchange rate on the Zimbabwean Balance of trade (BOT) using the Ordinary Least Square (OLS) method of estimation for secondary data covering the period between 1980- 2005. The study found out that the exchange rate had a negative coefficient of (-1.510995) showing that exchange rate depreciation affected the BOT position of Zimbabwe negatively. Exchange rate depreciation usually results in an improved export performance for the nation's which adopt it however this was not the case in Zimbabwe. This could be attributed to the fact that the domestic firms in Zimbabwe might have failed to increase their operations due to constraints on increasing production including, limited capital and productive capacity. The investigation henceforth recommends better management of exchange rate systems to help boost the BOT position of Zimbabwe.

Keywords: exchange, expenditure, inflation, consumption, economy

1. INTRODUCTION

Exchange rates which is the price of one currency (the domestic currency) in terms of another (the foreign currency) is critical for international economic transactions. Variations in the exchange rate have got the swell effect on the economic variables including; government expenditure, inflation rate, unemployment and interest rates. Exchange rates also create a link in the price systems of two different nations making it viable for international trade to make direct assessment of traded merchandises (Oladipupo, 2011). Exchange rates serve as one of the most important determinants of BOT position (Rincon, at el, 2001). Zimbabwean economy has been in a free fall state since the 1990s where the GDP was falling every year and inflation had been increasing (Kaminski and Ng, 2011). The real GDP per capita fell from $2, 247 in 1991 to $1, 925 in 1995 whereby the inflation was increasing and averaged 18, 9% by 1997 (National Budget Statement, 1999) which resulted in the decline in exports due to the fall in Zimbabwe's foreign exchange reserves.

The trade balance problems in Zimbabwe has been an evident feature for many years, thus Zimbabwe posted US$338 million current account deficit by 2004 National Budget Statement, (2005). At the same time the exchange rate in Zimbabwe had been depreciating, and Munoz, (2006) argues that by the end of 2004 the official exchange rate in Zimbabwe had fallen from Z$824 (US$1) to Z$5700 (US$1). The depreciation of the Zimbabwean dollar has to a larger extent affected the exchange rate which resulted in imports exceeding exports. From 1991 to 1995 supportive exchange reforms towards a liberalized trade and exchange were implemented through the Economics Structural Adjustment Programme (ESAP) which led to the adoption of the floating of the exchange rate and the liberalization of the Current Account in 1994.

A number of studies have been carried to try to determine the impact and relationship between exchange rates and the trade balance in several countries including studies by Yaya and Lu, (2012) in China, Herve, (2010) in Cote d'Ivoire, Onafawa, (2003) in Malaysia, Thailand and Indonesia. The main objective of this research is to analyse the impact of exchange rates on the BOT in Zimbabwe by looking at the effects of external debt on the BOT position in the country. It also focusses on the effect of household expenditure on the BOT.

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2. METHODOLOGY

The research is primarily based on secondary data obtained from the Ministry of Finance and Economic development as well as Zimbabwe Statistics Agency (ZIMSTAT). In this study, secondary data has the advantage of being accurate as it was timeously collected for policy making purposes. Literature review was used to provide argument and benchmarking. Econometric analysis of data was done using E-views statistical package and this also helped in checking the normality of the data collected.

3. RESULTS AND FINDINGS

3.1   Regression model

The data gave a regression model as shown in table 1 with the balance of trade being the endogenous variable whilst the exchange rate (EXRT), household consumption expenditure (HCE), government consumption expenditure (GCE), terms of trade (TOT) and external debts (EXE) are the explanatory variables and these variables are of the following functional form:

BOT = f (EXRT, HCE, TOT, GCE, EXE) Thus the econometric form is as follows:

$$\Delta BOT = B_0 + B_1 \Delta HCE + B_2 \Delta\Delta \log EXRT + B_3 GCE + B_4 \Delta EXE + B_5 \Delta TOT + \varepsilon_t$$
Where:
$B_0, B_1, B_1, B_2, B_3 And B_5$ they represent coefficients
ε_t = the error term with mean zero and a constant variance
Table 1: Regression Results

Variable	Coefficient	Std. Error	t- Statistic	Prob
C	9.249245	3.706877	2.495158	0.0225
DDLOGEXRT	-1.510995	0.771584	-1.958302	0.0659
DEXE	-0.120855	0.057193	-2.113099	0.0488
DHCE	-0.396657	0.090801	-4.368443	0.0004
DTOT	0.068133	0.02708	2.516010	0.0216
GCE	-0.447875	0.189666	-2.36138	0.0297
R- squared	0.677285	Durbin- Waston stat		2.621532
Adjusted R- squared	0.587641	Prob (F- statistic)		0.000560

As shown in table 1, the variables TOT, EXE, GCE and HCE are statistically significant at 5% level of significance, while EXRT is statistically significant at 10% level of significance. The constant is however statistically significant at 5% level as well. The F test probability value is 0.00056 and this is less than 0.05, implying that the whole model is significant at 5% level of significance. In addition, the coefficient of determination, R2 is 0.677285 while the adjusted R2 is 0.587641. This adjusted R2 shows that the model is justly a good fit since more than half of the deviations, (58%) are described within the model. The model is in line with the one developed by Brada et al, (1976).

Exchange rate (LogEXRT) is statistically significant at 10% level of significance, with a negative coefficient of (-1.510995), indicating that a 1% decrease in exchange rates worsened the BOT position in Zimbabwe by (0.015%). In Zimbabwe the depreciation of the exchange rate did not ultimately increase the exports therefore the trade deficit persisted. The depreciation or decrease of the Z$ as compared to the US$ was supposed to make Zimbabwean

exports cheaper and favorable on the international market. However due to production and capital constraints domestic firms might have failed to increase their operations to match the increase in export demand.

External Debt (EXE) is statistically significant at 5% level with a negative coefficient of (0.12085), indicating that a 1% increase in external debt for Zimbabwe will result in a reduction in economic growth by (0.12%). This is attributed to the fact that an increase in external debt results in currency devaluation which in turn affects a nation's economic growth resulting in a decline in its exports specifically for developing countries as argued by (Ojo, 1989).

Household Consumption Expenditure (HCE) k is found to be statistically significant at 5% level of significance with a negative coefficient of (-0.396657), implying that a 1% increase in household expenditure will result in a (O.39%) decrease in the trade balance. Developing countries face increased consumption patterns as a result of the rise in the demand for imported goods as households seek to improve their personal standards of living (Saruni, 2006) this in turn causes a deficit in the trade balance as a country becomes a net importer rather than net exporter.

Terms of Trade (TOT) is statistically significant at 5% level of significance with a positive coefficient of (0.668133), thus implying that a 1% increase in exports will improve the trade balance by (0.66%). This shows that the terms of trade in Zimbabwe is favourable for economic growth and development, since the exports in Zimbabwe are increasing at a faster rate than the imports

Government Consumption Expenditure (GCE) is statistically significant at 5% level of significance with a negative coefficient of (-0.447875), indicating that a 1% increase in government expenditure will result in a (0.44%) deficit in the trade balance. Government expenditure in Zimbabwe has been based on government spending money on more foreign assets (imports) than exports as evidenced by the negative relationship.

3.2 Correlation

The outcomes from a correlation test carried on stationary variables are shown in Table 2

Table 2: Correlation matrix

	DBOT	DDLOGEXRT	DEXE	DHCE	DTOT	GCE
DBOT	1.000000					
DDLOGEXRT	-0.171106	1.000000				
DEXE	-0.204965	0.185483	1.000000			
DHCE	-0.463350	0.036590	-0.189070	1.000000		
DTOT	0.463180	0.265803	0.024276	-0.002386	1.000000	
GCE	-0.183750	-0.214764	-0.006907	-0.446137	-0.397892	1.000000

The results show absence of multi-collinearity. This is so because the partial correlation coefficients in absolute terms are all less than 0.8. In essence, the individual effects of explanatory variables on the explained variable can be isolated since they do not move together in systematic ways.

3.3 Descriptive Statistics

Table 3: Descriptive Statistics

	BOT	TOT	HCE	GCE	EXE	EXRT
Mean	-1.990856	90.41158	67.31708	18.89401	52.22642	3517.213
Median	-1.823710	94.05800	64.93680	17.96824	57.68515	6.210000

Maximum	3.894500	116.6030	92.20996	27.48708	86.50246	84587.57
Minimum	-9.257967	42.62000	50.43086	14.94707	12.03110	0.630000
Std. Dev.	3.864736	16.62592	8.574910	3.088875	20.56428	16573.17
Skewness	-0.270533	-0.863712	1.005353	1.129201	-0.250881	4.765761
Kurtosis	2.039740	3.923133	4.430476	3.753497	2.073341	23.82074
Jarque-Bera	1.316090	4.155849	6.596632	6.140484	1.203002	568.0492
Probability	0.517863	0.125190	0.036945	0.046410	0.547988	0.000000
Observations	26	26	26	26	26	26

There are some variations in the variable observations as shown by standard deviations. On the other hand, the coefficients of skewness were positive for HCE, GCE and EXRT showing that these are positively skewed and skewness was negative for BOT, TOT and EXE displaying that these observations are negatively skewed. In addition, the Jacque-Bera probability value for these variables BOT, TOT and EXE is greater than 0.05 while that of HCE, GCE and EXRT is zero. This implies that the hypothesis that the errors are normally distributed is rejected at 5% level of significance for the rest of the variables. However, although the normality assumption is not fulfilled, one can still proceed to run regression and still obtain the anticipated results. The assumption of normality is regarded as pointless to the regression model and hence it is just for suitability purposes (Greene, 2003).

3.4 Stationarity

Stationarity of variables was tested using the Dickey Fuller Tests which test for existence of a unit root. The null hypothesis that there is a unit root was tested against the unconventional hypothesis that there is no unit root of which its existence implies that the variables are nonstationary. The results are accessible in table 4.

Table 4: Unit Roots Tests Using ADF

Variable	BOT	EXRT	EXE	TOT	HCE	GCE
ADF Statistic	-5.280981	-2.909713	-4.113132	-9.144292	-5.660601	-4.2454
Critical Value at 5%	-2.991878	-3.020686	-2.991878	-2.991878	-2.991878	-2.986225
Critical Value at 10%	-2.635542	-2.650413	-2.635542	-2.6335542	-2.635542	-2.632604
Order of Integration	1	2	1	1	1	0

As shown in Table 2 only one variable GCE is stationery at its level and hence is integrated of order zero. Variables BOT, EXE, HCE and TOT had at least a unit root and this means that they were non-stationary at their levels. After being differenced once, variables BOT, EXE, HCE and TOT became stationary at 5% and 10%level of significance as presented above. Variable EXRT however became stationary after being differenced twice and hence it is differenced of order 2.

3.5   Diagnostic of test

For normality tests the calculated Jacque-Bera statistic was found to be 0.08686 and the probability value was 0.957496. This value is greater than 0.05 and hence we may accept the null hypothesis that the errors are normally distributed at 5% level of significance.

Autocorrelation test was done using the Durbin-Watson test, which concluded that there is no autocorrelation among successive error terms if the computed D-W statistic lies between D_{Upper} and (4- D_{Upper}). The D-W calculated value obtained is 2.621532 and this is not between [1.902; 2.098], therefore the results are inconclusive.

3.6   Heteroskedasticity

Table 5: Heteroskedasticity Test: Breusch- Pagan- Godfrey

F-statistic	0.204394	Probability	0.6558
Obs*R-squared	0.221703	Probability	0.6377

Using the Breusch- Pagan- Godfrey test, the results obtained strongly reinforced the null hypothesis that the errors are homoscedastic. The probability value was 0.6377 and this is greater than 0.05, implying that we may accept the null hypothesis at 5% level of significance. Therefore, the penalties of this problem are the same of those of autocorrelation which include, large standard errors, incorrect t-calculated and F-calculated values are eliminated and thus inferences made from the results obtained would be valid and hence can be relied upon.

4.   CONCLUSION AND RECOMMENDATIONS

The research modelled the impact of exchange rates on the trade balance in Zimbabwe, by means of the Ordinary Least Square technique (OLS). It was observed that exchange rates, government consumption expenditure, external debt, terms of trade and also household expenditure amongst the other investigated variables where the main contributing factor to trade deficit in Zimbabwe. These variables as evidenced from the above study contributes up to (67%) of the variations in the BOT. Also policy instruments on international trade such as the trade liberalization imposed by the Zimbabwean government under the Economic Structural Adjustment Programme (ESAP, 1991 - 1995) also impacted on the trade balance. The results proved that the main variable under investigation, exchange rates has a negative effect on the Zimbabwe BOT thus with a coefficient of negative (-1.510995).

The research recommends proper management of the exchange rates in Zimbabwe as evident from the study above since exchange rates negatively influences the BOT with a coefficient (-1.510995). It is also observed from the study that devaluation has limitations in trying to deal with the trade deficit. There is need for proper maintenance in the foreign exchange and parallel market in order to attain the goals of having a functional exchange rate regime. The management should not over value the exchange rate in future, because this will result in an unmanageable BOT and an exponential increase in the external debt stock. Government officials should allow the exchange rate to find its stability level to enable the BOT position to be viable. On the other hand, the government should embark on policies to raise tariffs on the imported finals thus discouraging importation of goods and services, which aids in increasing domestic production. The government should also come up with means to increase savings in order to finance domestic investment thus helping boost the local exporting industries to enable of the nation gain from a positive Terms of Trade. Increasing the local industrial base through an improvement in the domestic production capacity thus infrastructural development and the development of the Human Resource base help local infant industries to grow and become competitive.

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