Trade Balance Analysis in Zimbabwe: Import and Export Examination Using Vector Auto-Regression Model

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Abstract: *Zimbabwe, just like many other developing nations have failed to register a positive trade balance for the past decade. Zimbabwe, is then labelled a net-importer or a permanent net-importer, since imports have always been greater than exports. Despite differences in value of imports and exports, quality is also essential to determine the country's development path. The trade balance is affected by both international and domestic events. Chief exports for Zimbabwe remains primary products which are unprocessed, while the country imports finished products which have been value-added. The study seeks to analyse the trade balance over the years 1980 to 2017, paying particular attention to the periodic trends. The study also explore the relationship between the trade balance components, being imports and exports. The study employed a trend analysis and a statistical analysis to attain its study objectives. The study noted a general rise in both exports and imports, however imports significantly above imports for the entire study period, whether for merchandise or non-merchandise. ADF unit root tests were applied to time series data and variables were found to be integrated of order one. Imports have been found to Granger cause exports while exports Granger cause imports as well. Johansen Cointegration test shows that exports and imports are cointegrated, however using the VAR model, the error correction term was insignificant, discarding the existence of a longrun relationship. Exports levels are affected by its past values and also past values of imports significantly. Imports are also affected by historical exports significantly. Improvement in export policy is critical, value addition to exports, market fetching through regionalism and import substitution is essential to manage the trade balance.*

Key words: *Trade balance, Trade deficit, Trade surplus, Exports, Imports, Cointegration, Vector Auto-Regression, Granger Causality, Zimbabwe.*

JEL Codes: *C01, C32, F13, F15, F18, F43, F62.*

I. Introduction

Trade balance refers to the value of exported goods minus the value of imported goods (Statista, 2018). Trade balance surplus refers to a positive trade balance, when exports are greater than imports, while a trade deficit arises when exports are less than imports. Exports are domestically produced goods and services sold abroad; imports are the purchase of foreign goods and services (Romero, 2012). When a country buys more goods than what it is selling to the rest of the world, it simply means it is borrowing. The concept of borrowing is explained by the national current account. The current account is the difference between income and expenditures, which, in addition to net exports, includes interest earned on foreign investments, debt payments to foreign investors, and net unilateral transfers, such as foreign aid (Romero, 2012).

To improve trade balance, many economies follow the Marshal-Lenner concept of devaluation, proposed by two economists Alfred Marshall and Abba Lerner. Devaluation of the exchange rate reduces the price of exports hence the demand for exports will increase, while price of imports will rise hence the demand for imports will decrease (Shigeyuki, 2008: 13). However, for devaluation to be effective, the Marshall-Lerner condition should be met; deterioration in the terms of trade is to improve a country's trade balance, provided that the sum of the country's price elasticity of demand for exports and imports must be greater than one in absolute value. Yuen-Ling, Wai-Mun and Geoi-Mei (2008: 130), supported the fact by indicating that depreciation of the currency has great impacts to trade balance but the impact may vary, probably due to different level of economic development. The J-curve concept, however, explains that after devaluation, the amount of export and import may not be responsive at the initial period of depreciation, but improves later with time.

While it is an objective for many developing countries to improve their trade balance, policies to close the gap between imports and exports should be handled with care. Devaluation as one method has brought problems in many countries than solving. Devaluation-based policies would cause increases in the cost of import (Yuen-Ling, Wai-Mun and Geoi-Mei, 2008), as commonly termed "imported inflation", which makes imports more expensive and affects such companies which imports inputs for their

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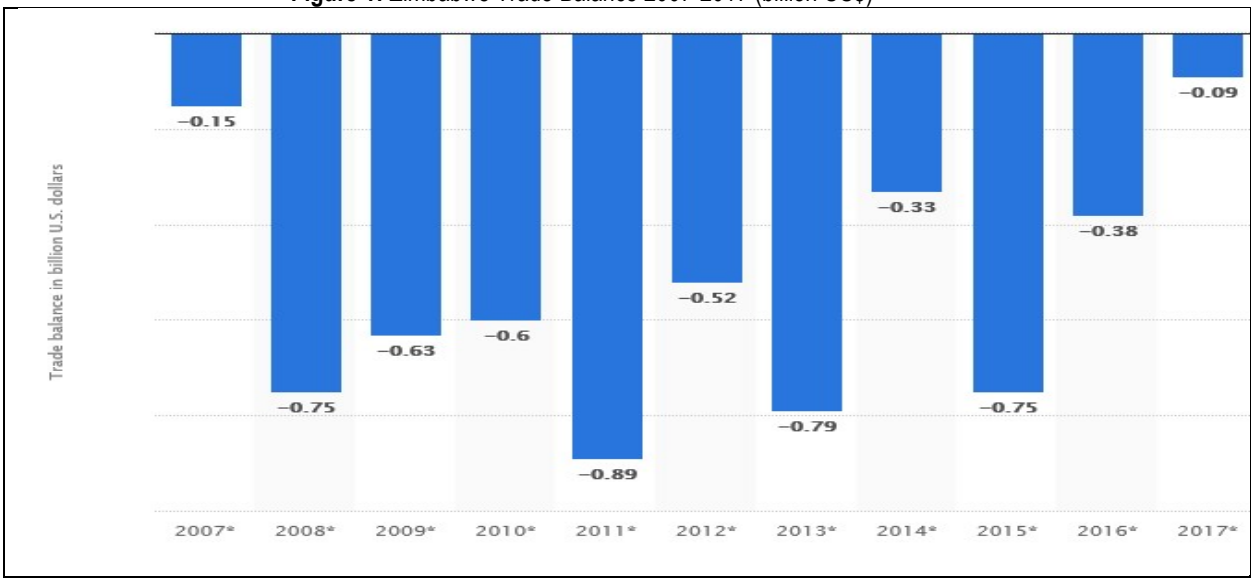
production. Devaluation may fail to work for an economy, if the concept is applied by other economies at the same time. A policy that encourages developing imports substitutes remains favourable. Import-substitution to be a success however, requires technological advancement and infrastructure development in most developing nations. According to Bonga, Shenje and Sithole (2015: 452), there is a greater need to raise exports both in terms of value and volume. Asian and Latin America experiences have shown the importance of export growth to support economic growth.

Countries such as Germany, Austria, Finland, Netherlands, Switzerland, Sweden and Ireland have recorded large trade surpluses, while some industrialised countries like USA, Greece, Portugal, Spain, United Kingdom and Australia have persistent trade deficits (Falk, 2008). Worth to note is that, the effects of trade deficits across countries have varying impacts to the development path.

II. Zimbabwe Trade Balance

Zimbabwe, for the past decade has recorded a negative trade balance, hence trade deficit, implying that imports have always been greater than exports. Zimbabwe is a net-importer. The trend of the trade balance is shown in Figure 1 below;

Figure 1: Zimbabwe Trade Balance 2007-2017 (billion US$)



Source: Statista, 2018

Figure 1 shows the trade balance for period 2007-2017, in billions US$. Over the decade, there has been an oscillating pattern, without a definite pattern over the years. The country reached a peak deficit in 2011, with US$0.89 billion, while the country recorded the lowest trade balance deficit of US$0.09 billion in 2017. A significant improvement, with a definite trend occurred for years 2015, 2016, and 2017, deficit dropping from US$0.75 billion, US$0.38 billion to US$0.09 billion.

Zimbabwe exports various commodities, of which many are in primary form. Siyakiya (2016: 9), indicated that Zimbabwe's exports are diversified ranging from agricultural products to mineral products namely tobacco, pearls, precious stones, ores, slag, ashes and cotton. Majority of imports into Zimbabwe are finished products from various economies. Table 1, below shows the top exports and top imports for the Zimbabwean nation.

Table 1: Top Exports and Top Imports for Zimbabwe 2016

Top Exports	Top Imports
• Gold ($896M), • Raw Tobacco ($383M), • Diamonds ($206M), • Ferroalloys ($163M) • Nickel Mattes ($149M),	• Refined Petroleum ($1.19B), • Corn ($285M), • Electricity ($162M), • Packaged Medicaments ($158M) • Delivery Trucks ($114M).

Source: OCD, 2018

Table 1 above shows that the top exports include gold, tobacco, diamonds, ferroalloys and nickel mattes. Exports are dominated by minerals. Zimbabwe top imports include refined petroleum, corn, electricity, medicaments and delivery trucks. Inorder, to significantly reduce trade balance deficit, the economy should aim at increasing the production of its top exports, and/or value-adding the products before exporting. Export competitiveness is determined by the quality of the exports themselves, extent of value addition of these exports and the exchange rate between the exporting country and the importer (Siyakiya, 2016: 10). On the import side, which might be a little difficult for a developing nation like Zimbabwe, work on import substitution. However, some essentials like fuel and medicaments, import-substitution will not work, hence calling for a different approach. According to IMF Country Report (2017: 10), agriculture, mining, and industry in Zimbabwe have substantial underutilized capacity and offer significant opportunities for domestic value addition. The physical infrastructure, though not adequate, is adequate enough to push Zimbabwe to a better level of development than the current, and human capital is high enough as well.

While Zimbabwe, trade with the global world, there exist major trading partners. Table 2, below shows the top exports destination, and the top imports origin for the Zimbabwean nation.

Table 2: Top Exports Destinations and Top Imports Origin for Zimbabwe 2016

Top Exports Destination	Top Imports Origin
• South Africa ($1.31B), • Mozambique ($267M), • United Arab Emirates ($216M), • China ($134M), • Belgium-Luxembourg ($102M).	• South Africa ($2.21B), • Singapore ($1.02B), • China ($380M), • India ($170M), • Zambia ($170M).

Source: OCD, 2018

Table 2, indicate that South Africa is the main export destination for Zimbabwean products, with US$1.31 billion worth of exports. Some Zimbabwean products are destined for Mozambique, United Arab Emirates, China and Belgium-Luxemborg. Zimbabwe mainly imports from South Africa, Singapore, China, India and Zambia. Worth to note is the two economies South Africa and China, both emerge as top exports destinations and top imports origin. There exist a special relationship for Zimbabwe with South Africa and China.

2.1 Imports and Exports Trends

Imports are frequently perceived to be a cost, while exports are generally considered a revenue (Van den Berg et.al, 2018: 6). Several trade policies have been in place since independence in 1980. Such policies have contributed to the general trend of country imports and exports. Figure 2 below shows the trend of both imports and exports.

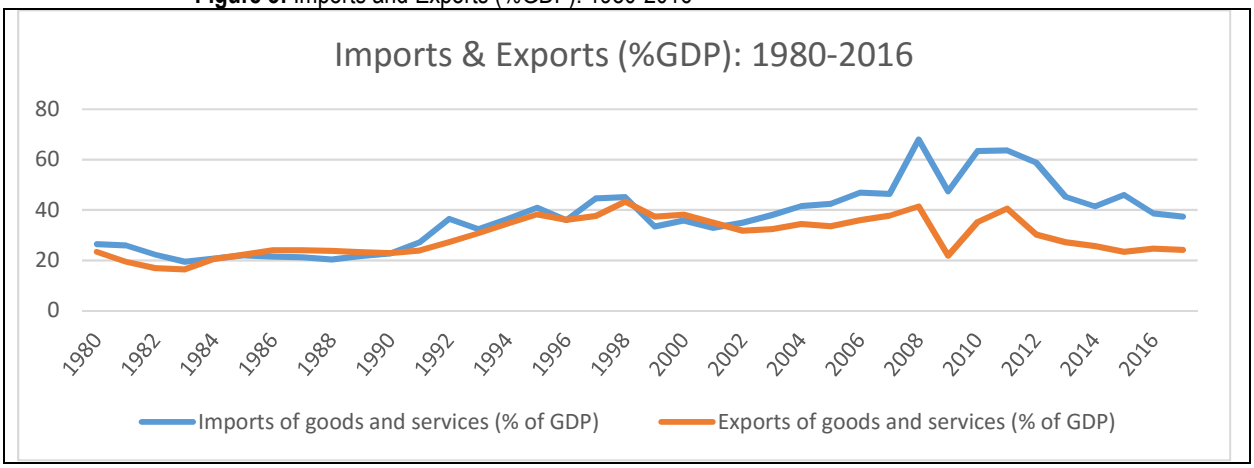
Figure 2: Zimbabwe Imports and Exports Trends: 1980-2016

Source: *World Bank Indicators, 2018.*

Figure 2 above shows trends of imports and exports for period 1980 -2016. There has been a general rise in both imports and exports from 1980 to 1997, and a decline until 2008, and a sharp increase with peaks in 2011, and a slight decline to the end period 2016. Exports and imports margin has been very small from 1980 until 2004, thereafter the difference between imports and exports became wider with time. On average imports have been larger than exports, hence defining a trade balance deficit.

Trends of imports and exports as a percentage of GDP is presented in Figure 3 below;

Figure 3: Imports and Exports (%GDP): 1980-2016



Source: World Bank Indicators, 2018.

From Figure 3 above, exports have reached a high peak for the period of about 42% of GDP in 1998, while imports have reached about 68% of GDP in 2008. For period 1980 to 2002, the share of both imports and exports to GDP has been fairly the same, indicating a low trade balance deficit. The gap later increased for period 2002 to 2016, with the highest gap recorded in 2011.

2.2 Merchandise Imports and Merchandise Exports

Total Imports and total exports are made up private and commercial. Merchandise imports/exports refers to commercial goods and services. In 2014, merchandise imports accounted around 60 percent of total imports in Zimbabwe. The finance minister, in his report notified that significant volume of the imported products were non-essential, cheap and sub-standard. Most of the goods imported could be easily produced in the country. Zimbabwe after the varnish of its local currency significantly rely on export revenues to generate liquidity and support domestic economic activity.

The trend for merchandise imports and exports is shown in Figure 4 below;

Figure 4: Merchandise Imports and Merchandise Exports: 1980-2016

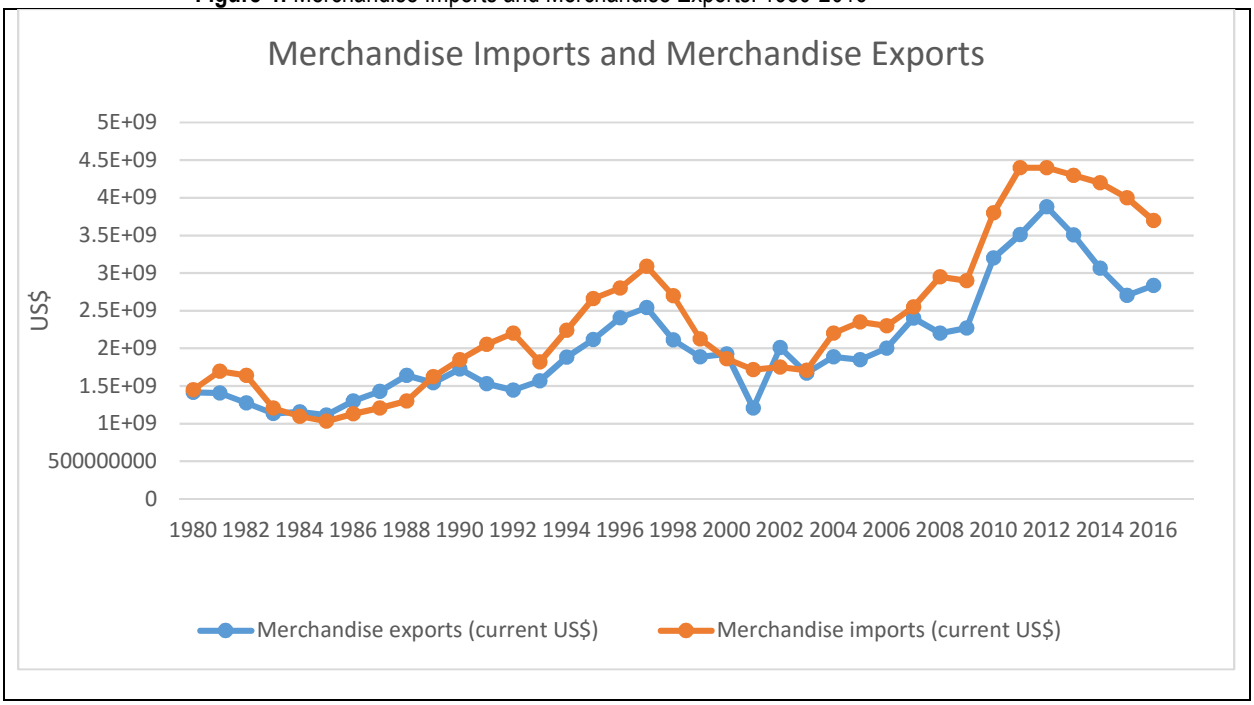


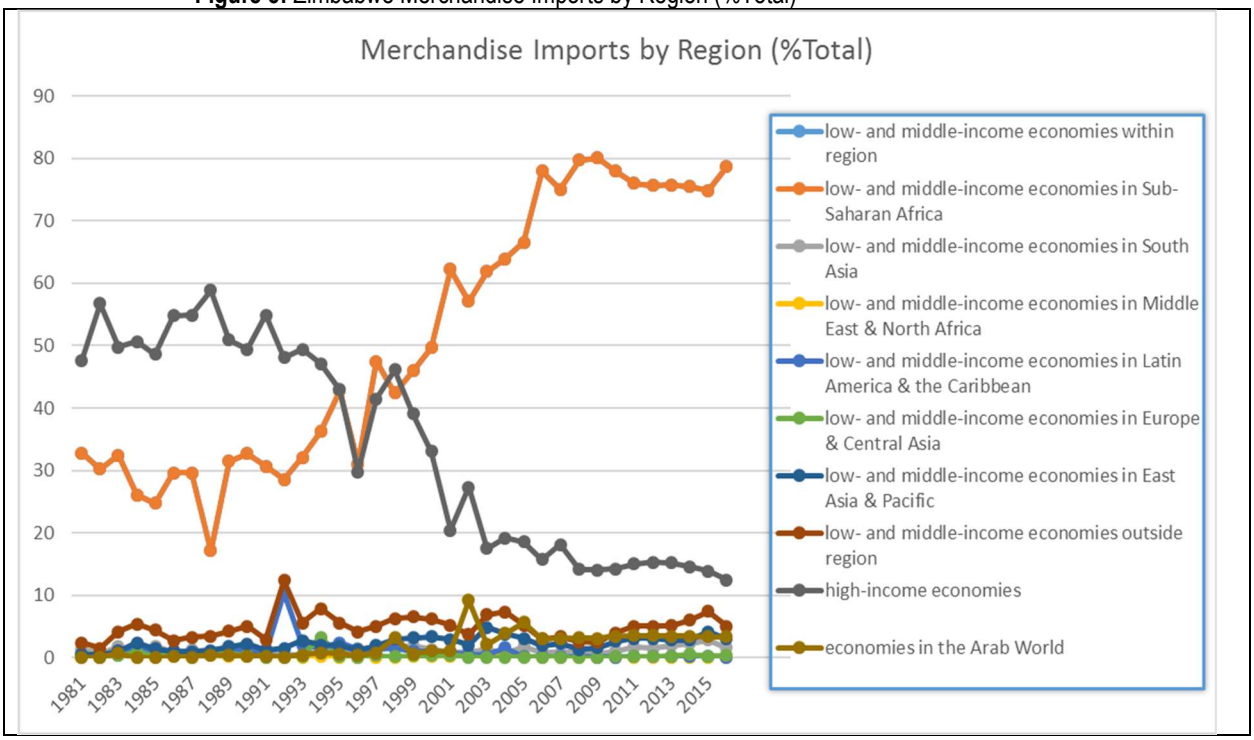
Figure 4 shows the trends of commercial imports and commercial exports for Zimbabwe for the period 1980-2016. For the period 1980-2003, both exports and imports have been oscillating around the same margins, with both trends exchanging heights, thereafter from 2003-2016, a rinsing trend for both has been recorded with commercial imports greater than commercial exports.

2.3 Imports Analysis

Zimbabwe imports over the period 1980-2016 has shown a near rising trend. However, there is greater need to understand the imports origin. Zimbabwean imports originate from various parts of the world, where the nation has various trade agreements and political friendships, among other determining factors.

Figure 5 below gives a clear picture of the origins of imports into Zimbabwe.

Figure 5: Zimbabwe Merchandise Imports by Region (%Total)



As shown in Figure 5 above, major imports into Zimbabwe for the period 1980-2016 has been dominated by low-medium income economies and high-income economies. Imports from high-income economies have dropped significantly for the period under discussion, from between 50-60% for 1980-1987, to around 10% in 2016. Such a trend was caused by poor relations between Zimbabwe and some high-income countries. As of current, the major imports are coming from low and medium income economies contributing nearly 80% of total imports into Zimbabwe. Other regions like the Arab world, Europe and Asia, latin America and Carribean, among other regions have been constantly supplying imports of just below 10% of total. Major notable difference has been on high-income economies and low-medium-income economies in the SSA regions. Zimbabwe since 1998 has been obtaining its imports from the SSA region.

2.4 Exports Analysis

Zimbabwe major exports have been minerals and agricultural products especially tobacco. Figure 6 shows the destinations of Zimbabwean exports over the period 1980-2016.

Figure 6: Merchandise Exports by Region (%Total)

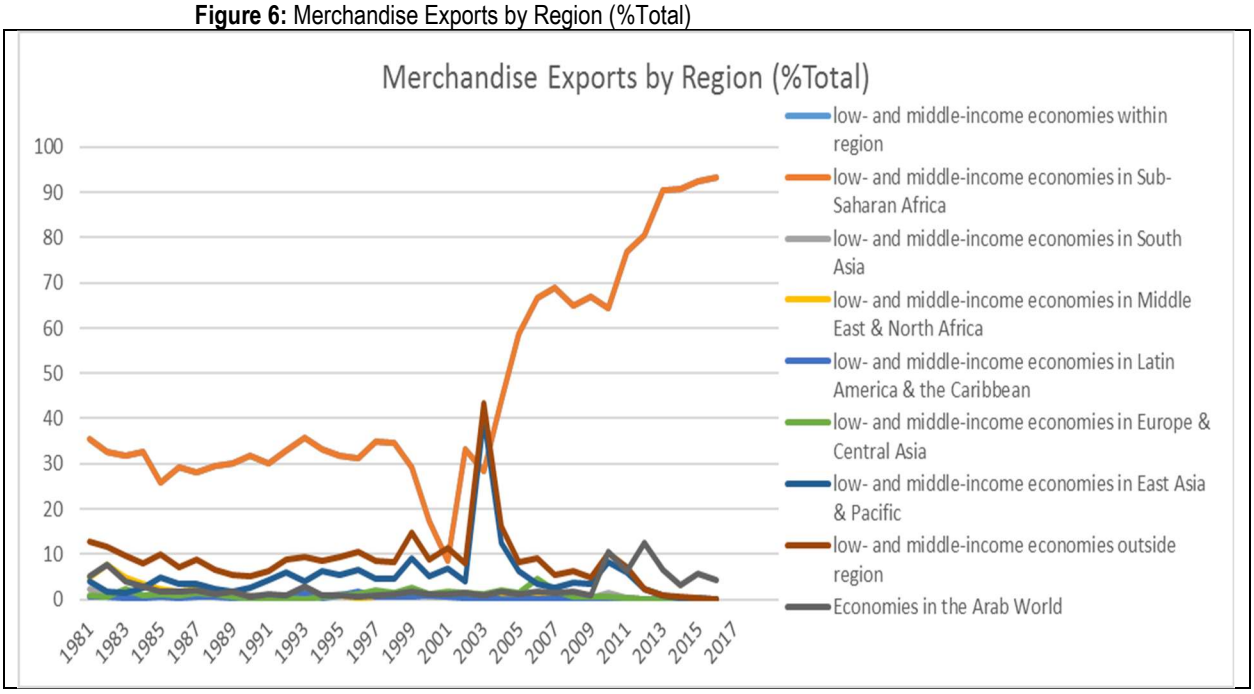


Figure 6 shows that, for the entire period merchandise exports for Zimbabwe has been destined to low and middle income economies in SSA region. Other regions with a noticeable trend include low and middle-income economies outside the region, and low and middle-income economies in Latin America and the Caribbean. The other regions have been receiving exports that are less than 10% of total merchandise exports.

3. Statistical Analysis of Exports and Imports

Exports and imports form the trade balance. The difference between the two matters a lot in the economic interpretations to determine the development path of the nations. Although there is a considerable literature concerning the link between importing and productivity, the literature regarding the link between importing and export performance of firms is almost non-existent (Van den Berg et.al, 2018: 6). According to Babatunde (2014: 45) the dynamics of the relationship between exports and imports hold significant importance for economies and have attracted the interest of researchers in testing the nature of relationships.

The study uses data from 1980 to 2017, of both imports and exports to check on the statistical relationships between exports and imports. The data used is for the current prices. The study uses Eviews 10 version in its data analysis.

3.1 Correlation

The correlation between exports and imports in levels is computed. The results are shown below.

	M	X
M	1	0.93228839...
X	0.93228839...	1

According to the above statistics of 0.932, there is a strong correlation between imports and exports. The two variables move together, with a positive relationship. Any correlation above 0.8 is regarded as strong using the rule of thumb. Such level of collinearity has blocked many studies from including the two variables in one equation. The various studies have linked exports and imports through productivity variable. Worth to note is that correlation does not necessarily imply causation, and distinguishing

between these two is by no means an easy task (Lin, 2008). Husted (1992) and Arize (2002), have linked exports and imports using simple linear models, statistically testable.

Husted (1992)	$X_t = \alpha_t + \beta M_t + \varepsilon_t$
Arize (2002)	$M_t = \alpha_t + \beta X_t + \varepsilon_t$

The relationship between exports and imports has been the subject of investigation in developed and developing economies (Al-Khulaifi, 2013: 1124), hence many studies have been conducted across the globe with various results in place. A current Zimbabwean analysis will add to various empirical literature on the subject.

3.2 Stationarity

Econometrics requires working with stationary data for meaningful and trusted analysis. Investigating the time series characteristics of the imports and exports is conducted using the Augmented Dickey-Fuller test for unit root. The results are shown below;

Variable	ADF Statistic	ADF Critical Value		Interpretation
M	-0.373962	1% level	-3.621023	Not Stationary
		5% level	-2.943427	
		10% level	-2.610263	
X	-1.429132	1% level	-3.626784	Not Stationary
		5% level	-2.945842	
		10% level	-2.611531	

According to the statistics above, for both variables the ADF statistic is greater then the critical values, hence indicating the presence of a unit root. The variables are not stationary. The next step is to apply the differencing method, thereafter applying the ADF test again on new variables. The results are presented below;

Variable	ADF Statistic	ADF Critical Value		Interpretation
DM	-4.294031	1% level	-3.626784	Stationary
		5% level	-2.945842	
		10% level	-2.611531	
DX	-4.911397	1% level	-3.632900	Stationary
		5% level	-2.948404	
		10% level	-2.612874	

3.3 Descriptive Statistics

The variables DM and DX, indicating first difference, are stationary, implying they are integrated of order 1. Further analysis will be done using stationary variables. The descriptive statistics for stationary variables are presented below;

Summary Statistics

	DM	DX
Mean	1.32E+08	74171519
Median	1.06E+08	29429700
Maximum	2.35E+09	1.69E+09
Minimum	-1.39E+09	-6.01E+08
Std. Dev.	6.55E+08	4.13E+08
Skewness	0.692449	2.244205
Kurtosis	5.660985	9.492051
Jarque-Bera	13.87312	96.03435
Probability	0.000972	0.000000
Sum	4.90E+09	2.74E+09
Sum Sq. Dev.	1.55E+19	6.14E+18
Observations	37	37

- From the summary statistics obtained, DM is more dispersed than DX, as shown by the standard deviation.

3.4 Granger Causality

Does causal relationship exist between imports and exports? The Granger causality test will be applied to verify whether there is a causal relationship. Granger causality is one of the most popular techniques inuncovering the temporal dependencies among time series (Bahadori and Liu, 2013). Granger causality requires that the series have to be covariance stationary (Foresti, 2007: 5), hence the stationary series of imports and exports will be used (DX and DM). The results of the Granger causality test are shown below:

Null Hypothesis:	Obs	F-Statistic	Prob.
DM does not Granger Cause DX	33	3.17582	0.0315
DX does not Granger Cause DM		5.00170	0.0045

The causality test indicates that imports influence exports and exports influence imports. There is a simultaneous relationship between imports and exports. Worth to note is that, Granger causality measures whether one thing happens before another thing and helps predict it and nothing else (Sorensen, 2005). However, as noted again by Sorensen (2005), researchers secretly hope that Granger causality partly catches some "real" causality in the process.

3.5 Cointegration

The study will also carry a cointegration analysis to check whether exports and imports are cointegrated. Cointegration implies existence of long-run equilibrium and also implies common stochastic trend. Short- and long- run relationship among variables can be separated with cointegration. The other advantage of cointegration include improved long-run forecast accuracy.

Johansen Cointegration test has been used to check whether export and imports are cointegrated. The results, are shown below;

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.386424	24.23846	15.49471	0.0019
At most 1 *	0.201040	7.631111	3.841466	0.0057

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.386424	16.60735	14.26460	0.0209
At most 1 *	0.201040	7.631111	3.841466	0.0057

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

The Johansen Cointegration tests, both trace test and maximum eigen value test shows that the two variables are cointegrated. This implies that a long-run relationship exist. The Johansen cointegration method helps in identifying the appropriate VAR length, (see Al-Khulaifi, 2013: 1130). For this study, the appropriate VAR lag length is shown to be 2.

3.6 Vector Auto-Regression Model

The study will run a VAR model for exports and imports. The VAR model has been necessitated by the fact that the two variables are cointegrated, as shown by the Johansen cointegration test, and the Granger causality test has shown the two variables have a dual influence at each other.

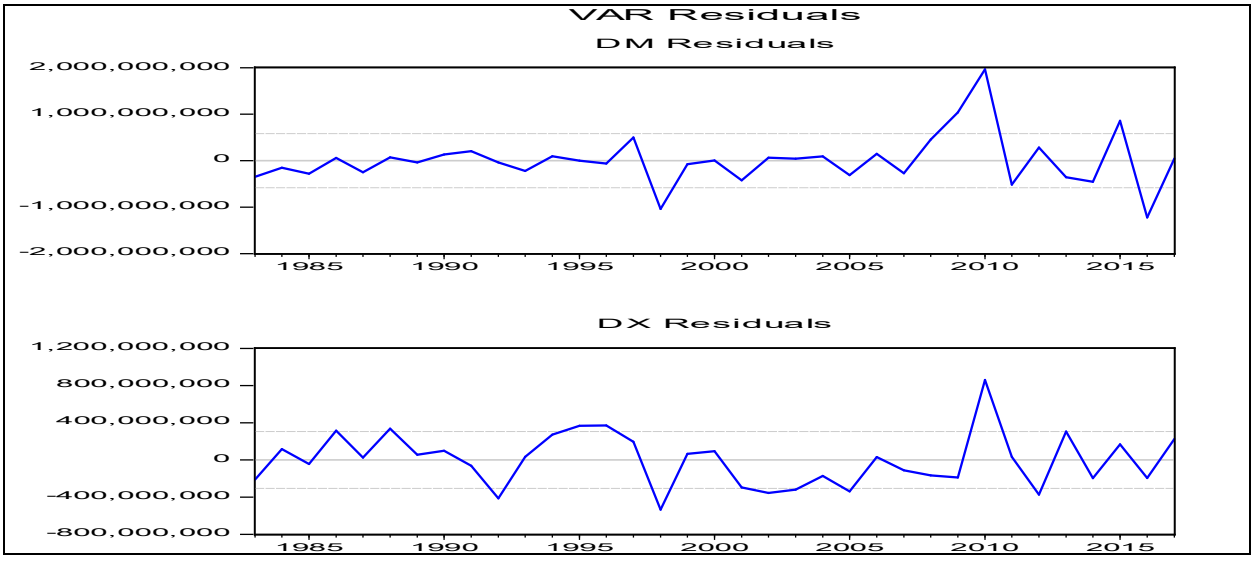
The results of the basic VAR model are shown below;

Vector Autoregression Estimates
Date: 08/29/18 Time: 18:17
Sample (adjusted): 1983 2017
Included observations: 35 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DX	DM
DX(-1)	-0.040160	0.805208
	(0.16923)	(0.32210)
	[-0.23731]	[2.49987]
DX(-2)	-0.839369	-0.513725
	(0.18077)	(0.34407)
	[-4.64331]	[-1.49309]
DM(-1)	0.465375	0.178466
	(0.10742)	(0.20447)
	[4.33214]	[0.87284]
DM(-2)	0.260673	-0.060410
	(0.11864)	(0.22581)
	[2.19718]	[-0.26752]
C	38371559	98924560
	(5.4E+07)	(1.0E+08)
	[0.71235]	[0.96487]
R-squared	0.539157	0.335623
Adj. R-squared	0.477712	0.247040
Sum sq. resids	2.81E+18	1.02E+19
S.E. equation	3.06E+08	5.83E+08
F-statistic	8.774540	3.788777
Log likelihood	-730.8533	-753.3798
Akaike AIC	42.04876	43.33599
Schwarz SC	42.27095	43.55818
Mean dependent	81703703	1.36E+08
S.D. dependent	4.24E+08	6.72E+08
Determinant resid covariance (dof adj.)		2.41E+34
Determinant resid covariance		1.77E+34
Log likelihood		-1479.340
Akaike information criterion		85.10516
Schwarz criterion		85.54954
Number of coefficients		10

The results of the basic VAR model above. The VAR model results show that past values of exports have a negative impact on current exports, however, the effect is insignificant as indicated by p-values. Also past values of imports have a positive impact on current exports, however, with insignificant effects as well. From the imports side, past values of exports have a insignificant fluctuating impact on current imports. Lagged values of imports have also registered insignificant fluctuating impact on current imports. The VAR model has not considered the short-run and long-run dynamics from the Johansen cointegration test, hence we may not conclude on them without checking on the Error-Correction term.

The VAR residuals have been computed to check on the model. The residuals are shown below, and the pattern displayed is near to stability.



3.7 Error Correction Model

The study will run an error correction model for the two equations, exports and imports, each as a dependent variable.

3.7.1 Error Correction Model [Exports]

The VAR Error correction model is specified in equation 3.1 as follows;

$$DX_t = a_0 + b_1 DX_{t-1} + b_2 DX_{t-2} + b_3 DM_{t-1} + b_4 DM_{t-2} + b_5 ECTM_{t-1} + \theta_t \quad ------(3.1)$$

The regression results of Equation 3.1 are shown below;

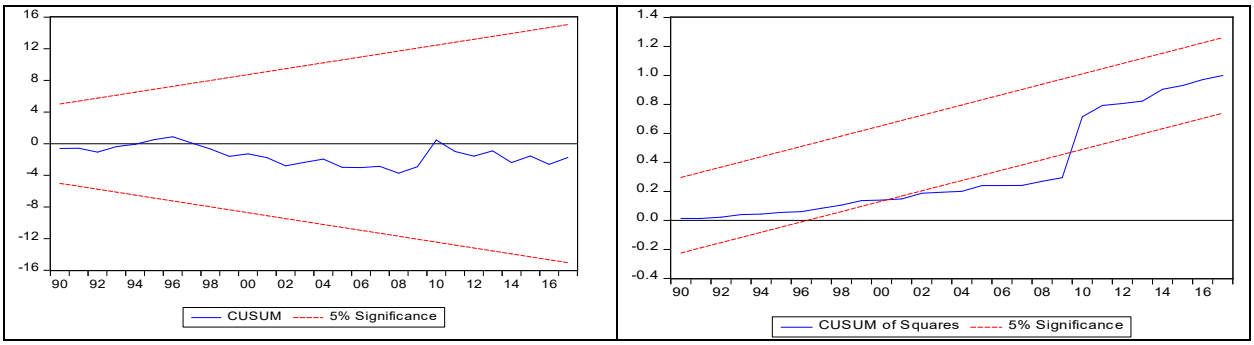
Dependent Variable: DX
Method: Least Squares
Date: 09/10/18 Time: 17:54
Sample (adjusted): 1984 2017
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47521797	56454334	0.841774	0.4070
DX(-1)	-0.106499	0.233687	-0.455734	0.6521
DX(-2)	-0.837993	0.186691	-4.488660	0.0001
DM(-1)	0.460207	0.110476	4.165690	0.0003
DM(-2)	0.282885	0.127729	2.214732	0.0351
ECTX(-1)	0.105162	0.287495	0.365789	0.7173

R-squared	0.544189	Mean dependent var	89070112
Adjusted R-squared	0.462795	S.D. dependent var	4.28E+08
S.E. of regression	3.14E+08	Akaike info criterion	42.12336
Sum squared resid	2.75E+18	Schwarz criterion	42.39271
Log likelihood	-710.0971	Hannan-Quinn criter.	42.21522
F-statistic	6.685804	Durbin-Watson stat	1.961300
Prob(F-statistic)	0.000326		

The above regression model reported an adjusted R-squared of 0.462, implying that in the specified model about 46.2% variation in DX is explained by the lagged values of DX and DM and the ECT. The F-statistic is significant (0.000326) implying the model is correctly specified. The current values of exports are negatively affected by twice lagged exports, and positively impacted by both lags of imports. The results implies that exports volumes are encouraged by levels of imports in the country. The high increase of imports in the country pushes the economy to export more to cover the gap (trade balance). The error correction coefficient is positive and insignificant, indicating that there is no existence of a long-run causality.

Stability of the model has been checked, and results are shown below;



The CUSUM test is based on the maximum of partial sums of recursive residuals (Perron, 2005). The CUSUM graph shows that the model is stable, as it lies within the 5% significant level. Hence the results of the model are reliable and can be used for policy. The CUSUM of Squares graph shows that the line crosses the acceptable range, and this shows the existence of structural breaks

for the period under study. Since independence Zimbabwe has adopted many trade reforms and policies leading to changes in patterns of trade statistics.

3.7.2 Error Correction Model [Imports]

The VAR Error correction model is specified in Equation 3.2 as follows;

$$DM_t = a_0 + b_1 DX_{t-1} + b_2 DX_{t-2} + b_3 DM_{t-1} + b_4 DM_{t-2} + b_5 ECTM_{t-1} + \theta_t \quad ------(3.2)$$

The regression results of Equation 3.2 are shown below;

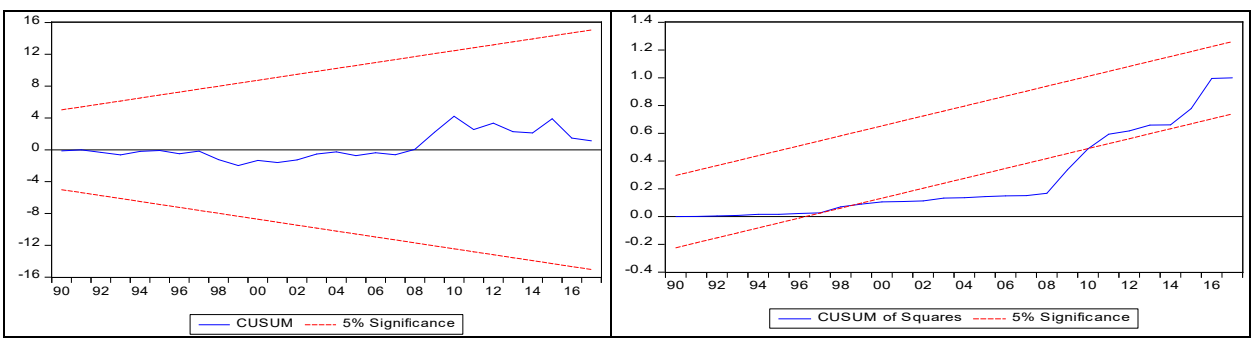
Dependent Variable: DM
Method: Least Squares
Date: 09/10/18 Time: 17:59
Sample (adjusted): 1984 2017
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61791861	1.12E+08	0.551815	0.5855
DX(-1)	0.594476	0.365277	1.627468	0.1148
DX(-2)	-1.010596	0.541434	-1.866516	0.0725
DM(-1)	0.823345	0.591653	1.391601	0.1750
DM(-2)	0.003222	0.231938	0.013891	0.9890
ECTM(-1)	-0.665965	0.570805	-1.166711	0.2532

R-squared	0.362631	Mean dependent var	1.52E+08
Adjusted R-squared	0.248815	S.D. dependent var	6.75E+08
S.E. of regression	5.85E+08	Akaike info criterion	43.37225
Sum squared resid	9.60E+18	Schwarz criterion	43.64160
Log likelihood	-731.3282	Hannan-Quinn criter.	43.46410
F-statistic	3.186112	Durbin-Watson stat	1.983636
Prob(F-statistic)	0.021160		

The results reported a correctly specified model as shown by the significant F-statistic of 3.186 (0.021160), at 5% level. A very low adjusted r-squared of 0.248815 has been reported, implying that only about 24.88% variation in DM is explained by the included explanatory variables. The variable DX(-2) is the only significant variable, with a coefficient of -1.01(0.072), indicating that lagged exports have a negative impact on the volume of current imports. Past volumes of imports have no significant impact on current imports. The error correction coefficient is negative and insignificant, indicating that there is no existence of a long-run causality. The coefficient on the error-correction term implies that a deviation from the equilibrium level of imports during the current period will be corrected by 66.5 per cent in the next period (however, this is insignificant, the current data tests does not support such, as the error correction term is insignificant)..

Checking on the stability of the model using CUSUM and CUSUM of Squares. The results are displayed in graphs below;



The results indicate the absence of any instability of the coefficients because the plot of the CUSUM statistic are confined within the 5 per cent critical bounds of parameter stability. The CUSUM of Squares graph shows the presence of structural breaks for the period under study.

4. Conclusion

The paper concentrated on trade balance analysis in Zimbabwe. The trend of imports and exports have been observed and analysed, paying particular attention to significant observed patterns for the period under study. The statistics indicated that the economy is a net importer, as imports have remained higher than exports for the period under study. The relationship between exports and imports have been examined further, as they form the component of the trade balance. Examination range from correlation, Granger causality, cointegration, and vector auto-regression analysis. Exports and imports have been found to be strongly correlated in the positive direction. A unidirectional effect has been found using the Granger causality test; exports Granger cause imports, and imports Granger cause exports. The two variables have been found to be cointegrated, signaling a longrun relationship. From the analysis made in the paper, both empirical and literature, the study recommends that export sector strengthening is critical to improve the trade balance of the nation. Exports quality are also a matter of concern, where value addition is critical to many of the primary exports. The country should take advantage to regionalism to expand foreign markets. Import substitution policy is also critical to cover some basic imports being made.

Lessons may be drawn from the Indian Government (The Foreign Trade Policy for 2005-2006). To boost its exports, the government of India through its Ministry of Industry and Commerce availed financial schemes under the banners of market access initiative (MAI) and market development assistance (MDA). Regular consultation with the private sector is critical when government is drafting and formulating trade policies. Establishment of SME consortia and export consortium is of paramount importance, because many SMEs face a number of challenges when exporting [see Bonga (2014), Bonga (2017)], and the challenges include; lack of necessary knowledge and financing, lack of capacity to meet foreign regulatory requirements, or low production quantities or differing quality of products that are not adequate for foreign buyers. Zimbabwe over rely on ZimTrade, which is on its own incapacitated, yet to stimulate exports, strong and specialised export promotion institutions must be established.

Furthermore, there is need to create an enabling business environment by improving the easy of doing business. In the fast changing world designing policy and legal framework which is in line with global developments is essential to stimulate exports. The relationship between imports and exports needs to be refined towards the overall development of the nation.

References

[1]. Al-Khulaifi Abdulla S. (2013). “Exports and Imports in Qatar: Evidence from Cointegration and Error Correction Model.” Asian Economic and Financial Review, 3(9):1122-1133.

[2]. Babatunde M.A (2014). “Are Exports and Imports Cointegrated? Evidence from Nigeria.” Journal of International and Global Economic Studies, 7(2), 45-67.

[3]. Bahadori Mohammad Taha and Liu Yan (2013). “An Examination of Practical Granger Causality Inference.” Proceedings of the 2013 SIAM International Conference on Data Mining.

[4]. Bonga W.G (2014). “International Trade: An Analysis of Hinderances and Survival Strategies by SMEs.” Social Science Research Network, http://dx.doi.org/10.2139/ssrn.2466031

[5]. Bonga W.G (2017). “Challenges Faced by SMEs on Exportation and Possible Strategies”. Social Science Research Network. Revised version, https://ssrn.com/abstract=2399878

[6]. Bonga W.G, Shenje T.E, and Sithole R. (2015). “Export Sector Contribution to Economic Growth in Zimbabwe: A Causality Analysis.” The International Journal of Business & Management, Vol. 3, Issue 10, pp. 452-464.

[7]. Falk, Martin. (2008). “Determinants of the Trade Balance in Industrialized Countries.” FIW Research Report N° 013.

[8]. Foresti Pasquale (2007). “Testing for Granger causality between stock prices and economic growth.” MPRA Paper No. 2962, http://mpra.ub.uni-muenchen.de/2962/

[9]. IMF Country Report No. 17/196, Zimbabwe, 2017.

[10]. Lin Jin-Lung (2008) Notes on Testing Causality. Institute of Economics, Academia Sinica, Department of Economics, National Chengchi University.

[11]. OEC (2018). "Zimbabwe." The Observatory of Economic Complexity. https://atlas.media.mit.edu/en/profile/country/zwe/
[12]. Perron Pierre (2005). "Dealing with Structural Breaks," Prepared for the Palgrave Handbook of Econometrics, Vol. 1: Econometric Theory.
[13]. Romero Jessie (2012). "Balance of Trade." Region Focus, Second / Third Quarter, Jargon Alert.
[14]. Shigeyuki Hamori (2008). "Trade Balances and the Terms of Trade in G-7 Countries: Penal Cointegration Approach." Applied Econometrics and International Development, Vol. 8(2), pp. 13-22.
[15]. Siyakiya Puruweti (2016). "An Econometric Analysis of Zimbabwe's Export Competitiveness." Maghreb Review of Economics and Management, Vol 03 - N° 02, pp. 6-19.
[16]. Sorensen Bent E (2005). "Granger Causality." ECONOMICS 7395.
[17]. Statista (2018). "Trade balance of Zimbabwe 2017." The Statistics Portal. https://www.statista.com/statistics/455354/trade-balance-of-zimbabwe/
[18]. Van den Berg M, Cremers D, Lemmers O, and Van Marrewijk C, (2018). "Does importing foster export performance? An overview of existing literature." CBS Heerlen, EBH-KIO.
[19]. Yuen-Ling Ng, Wai-Mun Har and Geoi-Mei Tan (2008). "Real Exchange Rate and Trade Balance Relationship: An Empirical Study on Malaysia." International Journal of Business and Management, Vol. 3, No. 8, pp. 130-137.

APPENDIX: Zimbabwe Imports & Exports (US$, current price)

Year	M	X	Year	M	X	Year	M	X
1980	1771437800	1560677300	**1993**	2129789900	2016378300	**2006**	2551253800	1957416600
1981	2075379800	1556227500	**1994**	2516441800	2384171900	**2007**	2454805000	1999583100
1982	1897496600	1445393900	**1995**	2909963900	2719089900	**2008**	3005097200	1831052800
1983	1511969000	1276639700	**1996**	3073962200	3090258100	**2009**	4088721400	1882654700
1984	1321559600	1306069400	**1997**	3805024100	3206715700	**2010**	6440274000	3569254400
1985	1240642500	1251797100	**1998**	2888629300	2778011500	**2011**	7708917000	4907581300
1986	1338069700	1495277800	**1999**	2298400000	2565485300	**2012**	8386153400	4306653100
1987	1434185800	1618950700	**2000**	2402207000	2552871400	**2013**	7000435600	4197687400
1988	1591090300	1855256800	**2001**	2232400000	2369300000	**2014**	6578074800	4080440700
1989	1799810800	1934216900	**2002**	2218000000	2019000000	**2015**	7503864600	3824969000
1990	2002043200	2008581800	**2003**	2179631000	1855571300	**2016**	6426700400	4098132100
1991	2347724600	2063885600	**2004**	2413376200	2001178100	**2017**	6673659800	4305023500
1992	2463290200	1838241100	**2005**	2445682100	1930796900			

Source: World Bank (Current US$)