

THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

Export Sector Contribution to Economic Growth in Zimbabwe: A Causality Analysis

Wellington G. Bonga

Ph.D. in Economics (AIU), MBA (ZOU), M.Sc. in Economics (UZ), Zimbabwe

Tawanda E. Shenje

M.Sc. in Economics (UZ), B.Sc. (Hons) in Economics (UZ), Zimbabwe

Rodrick Sithole

M.Sc. in Economics (UZ), B.Sc. (Hons) in Economics (UZ), Zimbabwe

Abstract:

Foreign currency reserves are of great significance to any developing country's economic growth prospects. Exports have been for long decades regarded as a major source of foreign currency and a driving force for economic growth. This paper empirically examines the export-led growth paradigm for Zimbabwe using historical data from 1975 to 2013. The study uses unit root tests, cointegration analysis, Granger causality tests, vector auto regression (VAR), Vector Error Correction (VEC) and impulse response function (IRF) in the analysis. The study aims at determining whether GDP, exports and imports are cointegrated; whether exports Granger cause growth, and whether exports Granger cause investment. Using STATA, the study found that the variables were not stationary in levels, hence differencing them to attain stationarity. No cointegration was found among the variables, and the Granger causality tests indicated a one-way causality between GDP and exports. There is no strong evidence for short-run causality running from export growth to economic growth. However, the use of VEC model and IRFs reveals that a long-run relationship exists between exports and non-export GDP, thereby supporting an export-led growth. Possible policy implications are distilled which encourage policy makers to favour export diversification and global value chains in improving export competitiveness.

Keywords: Exports, Economic Growth, Cointegration, Granger Causality, VAR, VEC, Zimbabwe

1. Introduction

Zimbabwe has for the past decades remained a net-importing country like most developing nations. However, there is a greater need to raise exports both in terms of value and volume. Abou-Stait (2005) alludes that exports of goods and services represent one of the most important sources of foreign exchange income that ease the pressure on the balance of payments and create employment opportunities. Exports can increase intra-industry trade, help the country to integrate in the world economy and reduce the impact of external shocks on the domestic economy.¹ Lessons from the East Asian economic miracle reveal how export-driven economic models propelled third world countries to first world economies at the rejection of import substitution. Just a handful of decades ago, these economies were more or less like Zimbabwe as far as development is concerned yet they managed to spur a post-war period of sustained economic growth. On the contrary, the Zimbabwean economy has struggled to take off since independence despite frequent trade policy reforms.

Though the export sector has been playing an important role in Zimbabwe's economic development, even before the 1991 reform program, there hasn't been a study that exhaustively tests the validity of Export-led-growth [ELG] in Zimbabwe. This paper intends to analyze the impact of exports on Zimbabwe's economic growth over the period 1975 to 2013.

In an effort to analyse the impact of exports on growth, the study relies on answering three questions. Whether exports, imports and GDP are cointegrated? Whether export growth Granger causes GDP growth? Whether export growth Granger causes investment growth? The paper also uses vector auto regressions (VARs), Vector Error Correction (VEC) and impulse response functions (IRFs) to investigate the impact of macroeconomic shocks.

The paper provides an empirical examination of the effectiveness of Zimbabwe's export driven strategy and an evaluation of the effectiveness of various economic policies adopted in the past two decades whose aim was to promote exports of goods and services. The research findings will aid policymakers in evaluating various economic policies, including their impact on foreign exchange, tariff

¹ Experiences of Asian and Latin American economies provide good examples of the importance of the export sector to economic growth and development, which led economists to stress the vital role of exports as the engine of economic growth.

and non-trade barriers, the role of income taxes, the reform of the public sector, and other policies and regulations that directly affect the performance of the export sector. The paper furthers scholarly debates on trade and economic growth by providing evidence on how the unfavorable policy environment in LDCs frustrates channels through which exports and openness in general promotes economic growth.

The paper comprises of six sections namely, introduction, literature review, overview of the export sector, methodology and data analysis and the conclusion and policy recommendation section.

2. Literature Review

There are several influential studies that provide a useful framework for analyzing the relationship between exports and economic growth, i.e., Baldwin and Forslid (1996), Feenstra (1990), Segerstrom, Anant and Dinopoulos (1990), Grossman and Helpman (1990), and Rivera-Batiz and Romer (1991). The basic idea behind this literature is that exports increase total factor productivity because of their impact on economies of scale and other externalities such as technology transfer, improving skills of workers, improving managerial skills, and increasing productive capacity of the economy. Another advantage of export-led growth is that it allows for a better utilization of resources, which reflects the true opportunity cost of limited resources and does not discriminate against the domestic market.

There are many more studies analyzing the role of exports in the economic growth specifically for developing countries. Most of these studies conclude by confirming the existence of a positive relationship between exports and economic growth, for example, Balassa (1978 and 1985), Jung and Marshall (1985), Ram (1985 and 1987), Chow (1987), Shan and Sun (1988), Bahmani-Oskoe, Mohtadi and Shabsigh (1991), Bahmani-Oskoe and Alse (1993), Jin (1995), Levin and Raut (1997), and Khalifa Al-Youssif (1997). Most of this literature attributes the effects of exports on economic growth to several factors. One of the key factors however is that exports promote thresholds effects due to economies of scale, increased capacity utilization, productivity gains, and greater product variety. It is also argued that exports of goods and services provide the opportunity to compete in the international markets that leads to technology transfer and improvement in managerial skills. Indeed, a recent review by Gunter, Taylor and Yeldan (2005) concludes that any gains from trade liberalization are often associated with external effects that are dynamic in nature.

After categorizing countries into 'open' and 'closed' based on indicators of export policy, tariffs and black market exchange rate premia, Sachs and Warner (1995) found that the average growth rate of per capita income of open economies was significantly higher than that of the other category in the twenty year period since 1970. Afonso (2001) examined the commercial and technological impacts on economic growth resulting from international trade since the classical period of Adam Smith up to the modern era of endogenous growth models. He found that trade openness, particularly export oriented trade policy was beneficial to both developing and developed countries. He concluded that openness affected the domestic rate of innovation for developing countries on one hand and on the other hand developing countries gained from the dynamic effects of economic integration which he termed 'the catch up of the convergence'.

Many studies have since succeeded in establishing the link between gains of trade and static effects. On the contrary, endogenous growth models advocated by Lucas (1988) and Romer (1986) in their empirical studies reveal the dynamic effects of trade.² Rodriguez and Rodrik (2000) nonetheless noted that statistical results in many of these studies were based on variables such as the black market premium which are more of macroeconomic dysfunction indicators than they are trade policy variables. In response Wacziarg and Welch (2002) formulated other openness indicators based on export data whose effects on growth were analysed by examining within-country impacts of discrete changes in trade policy openness.

Dollar and Kraay (2001) in an attempt to explore the implication of increased exports by developing countries, ranked the trade as shares of GDP for developing countries that had seen large increases in trade in the last twenty years. Though not conclusive, findings from their study on these post-1980 globalizers suggested that export growth, openness and increased international trade have substantial benefits associated with rising incomes, falling poverty and improved ability of some of the poorest countries to catch up with richer countries.

3. Overview of the Zimbabwe Export Sector

Zimbabwe has been exporting an average of US\$2,489,729,125 per year between 1990 and 2013. The value of exports over the period under review fluctuated between the highest of US\$4,771,211,000 in 2011 and the lowest US\$1,795,665,000 in 2009, World Bank (2013). The value of exports as of 2013 was \$3,978,000,000.

The figure below shows the trend of export earnings for the period 1990 to 2013.

²See also: Solow, R. (200) 'Applying Growth Theory across Countries', *The World Bank Economic Review* 15(2), pp.283.289

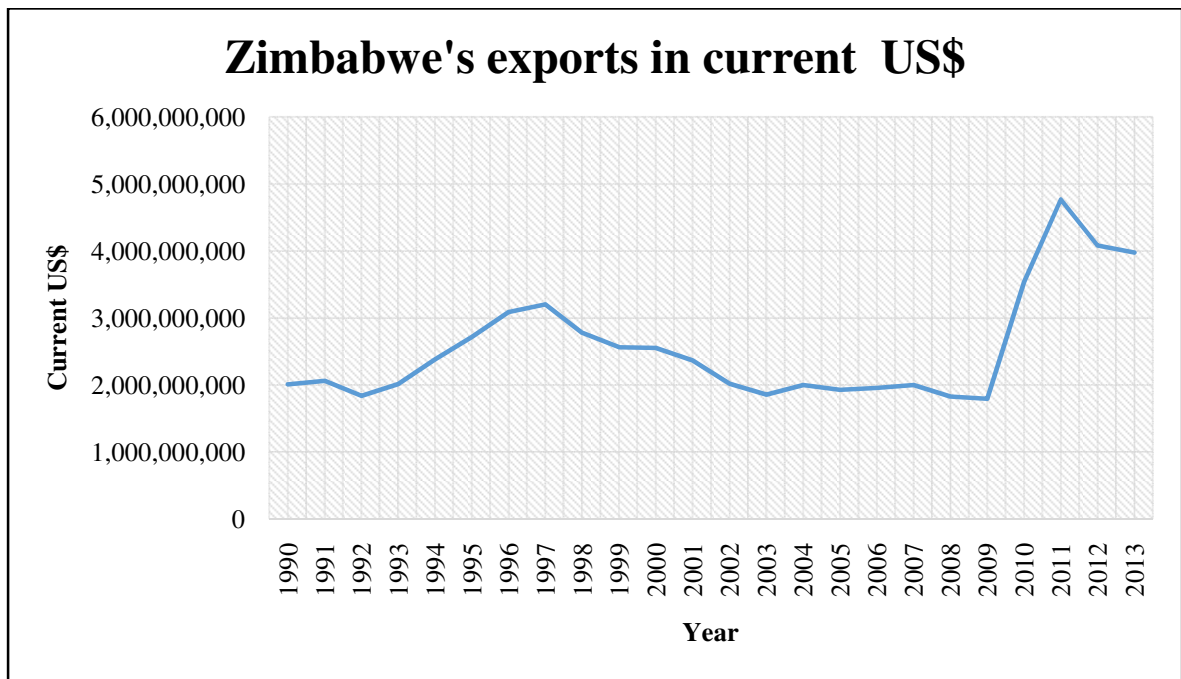


Figure 1

Source: World Bank national accounts (2013)

3.1 The Annual Export Growth In Zimbabwe 1990-2013

Zimbabwe annual exports took a downward trend from 1998 until 2009 before experiencing a sharp surge thereafter. The multi-currency regime registered some stability in the economy and a maximum annual export growth of 57.18% was experienced in year 2010. However the minimum annual export growth of (21.08%) was experienced in year 2008. From the peak annual export growth of 57.18% in 2010, exports growth took its sharpest dive to 17.73% in 2011, further plunged to a negative of -6.8% and -2.9% in 2012 and 2013 respectively, World Bank (2013).

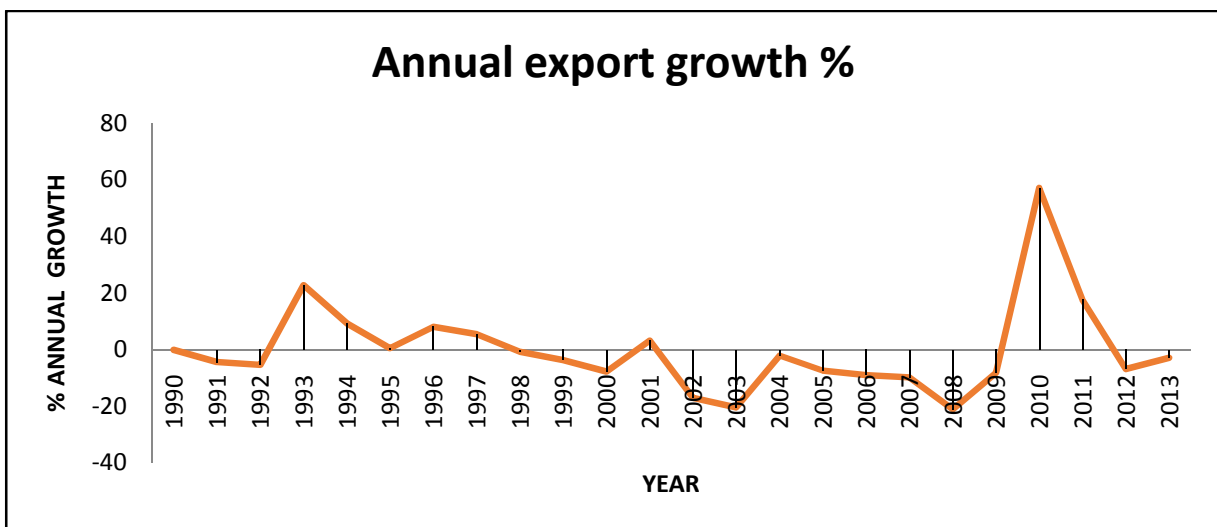


Figure 2

Source: World Bank national accounts (2013)

3.2 Zimbabwe Top Export Commodities

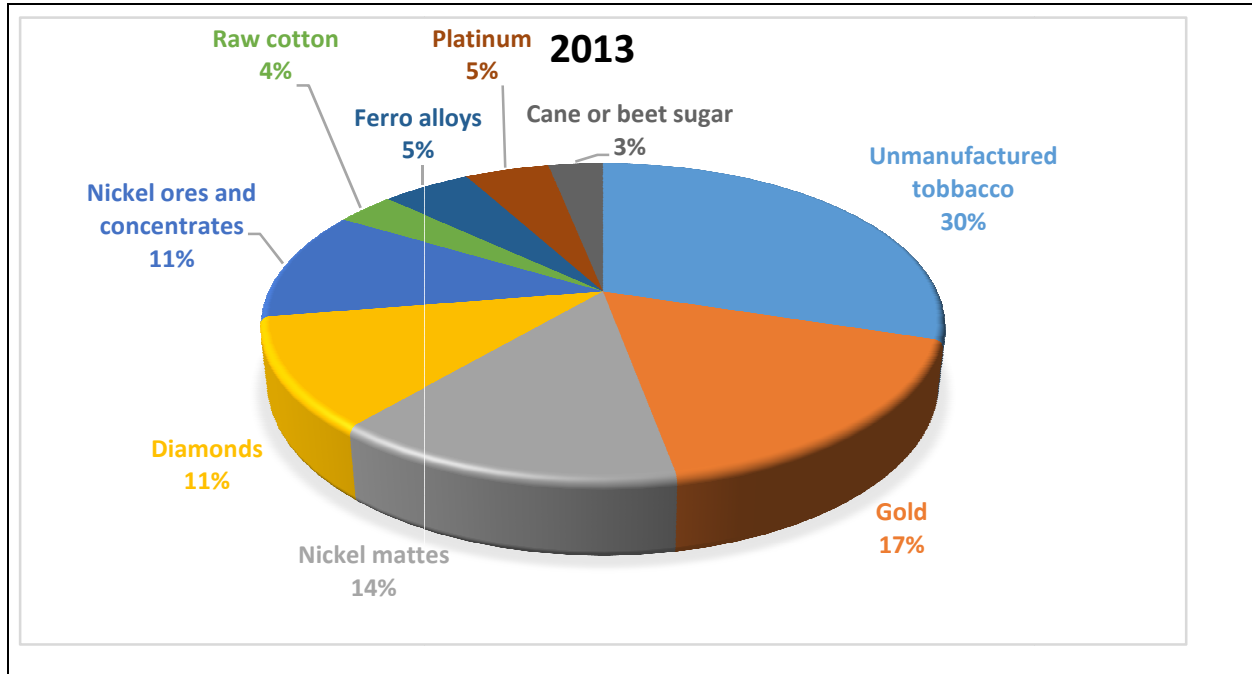


Figure 3

Source: UN comtrade database and UN service trade database (2013)

Zimbabwe’s main export commodities as of 2013 were platinum, raw cotton, unmanufactured tobacco, gold, ferroalloys, diamonds, nickel ores and concentrates, nickel mattes as well as cane or beet sugar as depicted on the pie chart above, UN Comtrade database(2013). From the graphical analysis it can be depicted that in 2013 Agriculture and Mining stood as Zimbabwe’s major export sectors.

3.3 Zimbabwe’s Annual Exports as a % of GDP 1990-2013

The graph below shows the trend of exports as a percentage of GDP for the period 1990 to 2013.

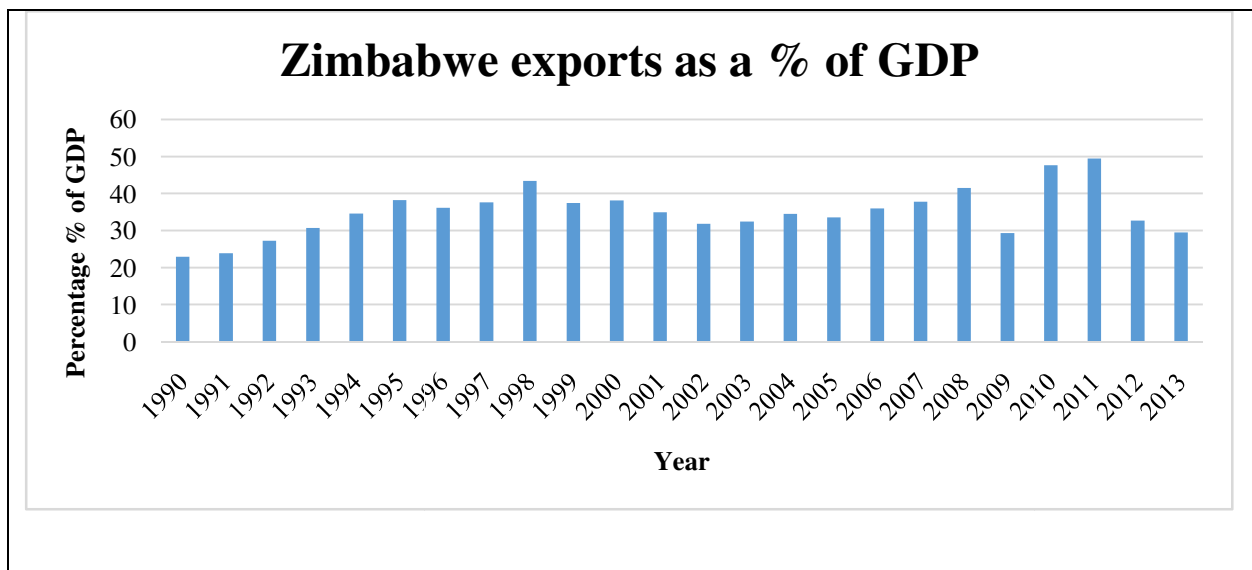


Figure 4

Source: World Bank National accounts (2013)

Exports of goods and services measured on current US\$ was 29.5% as of 2013, with the maximum being 49.41% in 2011 and the lowest value 22.87% in 1990, World Bank(2013). Exports fluctuated between these values over the period under review.

3.4 Export Policies Adopted between 1990 and 2013

The country followed an Import Substitution Industrialisation (ISI) strategy since the 1970s when international trade sanctions were imposed to the then Unilateral Declaration of Independence (UDI) colonial government under Ian Smith. The sanctions went through to 1990 when government focus shifted to trade liberalisation under a drive by the new government to expand exports. Zimbabwe adopted trade liberalisation policy under ESAP in 1990. This was tantamount to the government's re-focusing of policy from Import Substitution Industrialisation (ISI) to Export Led Growth (ELG) (Chigusiwa L, et.al, 2011). The argument was that, openness to trade and free market policies were fundamental in promoting exports (World Bank, 1987). Trade liberalisation and market deregulation were thus used as the principal drivers towards the implementation of ELG. The main focus on trade liberalisation was aimed at achieving an expansion of exports through diversion of resources from the domestic to the export sector. Such orientation would in turn lead to faster growth of GDP (Balassa, 1982). Exports were further stimulated throughout the 1990s by the continued devaluation of the Zimbabwean dollar, which was devalued seven times by more than 400 percent between 1991 and 2000. The establishment of the export processing zones (EPZs) in 1995 aimed at promoting foreign direct investment (FDI) which would in turn translate into an increase in manufactured exports. The EPZ programme also included several export incentives to promote export oriented production and development.

4. Research Methodology

In order to test for the validity of the ELG theory and its applicability to Zimbabwe, the paper establishes three hypotheses (i) whether GDP, exports and imports are cointegrated, (ii) whether exports Granger cause growth, (iii) whether exports Granger cause investment. The paper uses the IRF to see the impact of the external shocks on the variables. A VEC model will be run to test the long run relationship of export and economic growth. The results of this analysis will enable us to either accept or reject accepting or rejecting the validity of ELG model to Zimbabwe.

Six variables will be used and denoted as follows; (1) Real gross domestic product (GDP), (2) Real GDP without exports (GDPLEXP), (3) Net exports (X-M), (4) Real exports (EXP), (5) Real imports (IMP), and (6) Real gross capital formation (RGCF). The study follows that of Feder (1982), dividing the economy into two sectors, an export and a non-export sector. We isolate the "economic influence" upon the export sector by incorporating the growth accounting approach used to measure GDP, following the approach used by Sharma and Panagiotidis (2005).

5. Data Analysis and Statistical Results

Data used in the study has been collected in current state. Since the figures are too large, the data have been transformed using logarithm to maintain the data character.

5.1 Unit Root Tests

Unit root test is undertaken using the Augmented Dicky-Fuller tests and the Phillips-Peron test. The tests enable us to check on the effect of time on the variables. All the variables have been found to be non-stationary as shown on the table below.

VARIABLE	Level ADF statistic	Level PP test statistic	ADF Critical Values	Conclusion
GDP	-1.288	-1.660	@ 1%: -3.662	Non-stationary
Exports [EXP]	-1.083	-1.193		Non-stationary
Imports [IMP]	-0.078	-0.455		Non-stationary
Net Exports [NETEXP]	-3.080	-3.203	@ 5%: -2.964	Stationary @ 5%.
Real Gross Capital Formation [RGCF]	-2.461	-2.608	@ 10%: -2.614	Non-stationary
GDP less Exports [GDPLEXP]	-1.886	-2.034		Non-stationary

Table 1

First differences of non-stationary variables are calculated using the following formula: $\Delta Y_t = Y_t - Y_{t-1}$. The ADF and PP test are presented in the table below.

VARIABLE	First Difference ADF statistic	First Difference PP test statistic	ADF Critical Values	Conclusion
GDP	-4.909	-4.895	@ 1%: -3.668	Stationary
Exports [EXP]	-4.477	-4.344		Stationary
Imports [IMP]	-4.171	-4.183		Stationary
Real Gross Capital Formation [RGCF]	-6.787	-6.802	@ 5%: -2.966	Stationary
GDP less Exports [GDPLEXP]	-6.273	-6.277	@ 10%: -2.616	Stationary

Table 2

The table above shows that all the variables are stationary when differenced once, implying they are integrated of order 1 [$I \sim I(1)$]. The study has managed to eliminate the time effects by purifying the data through differencing.

5.2 Cointegration Test

A cointegration test is done for GDP, Exports and Imports. Imports are considered in this study as far as testing the causality between exports and growth is concerned. Failure to include imports will lead to biased results, Riezmann et al. (1996). The Johansen cointegration test is used and the results are as presented below.

COINTEGRATION TEST (GDP, EXPORTS, IMPORTS)			
Hypothesised No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value
None	0.00000	21.0876	29.68
At most 1	0.33488	5.9996	15.41
At most 2	0.12409	1.0973	3.76

Table 3

The Trace test indicates nocointegration at 5% significance level, hence the study fails to reject the null hypothesis of no cointegration between GDP, exports, and imports.

COINTEGRATION TEST (GDPLEXP, EXPORTS, IMPORTS)			
Hypothesised No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value
None	0.0000	21.0924	29.68
At most 1	0.33035	6.2554	15.41
At most 2	0.12533	1.3007	3.76

Table 4

The Trace test statistics are less than the critical values at 5% significance level, indicating that there is no cointegration between net GDP, exports and imports.

5.3 Granger Causality

The study will test whether export granger cause GDP and also whether export Granger cause Real Fixed capital Formation.

Granger causality Wald tests; Exports and GDP			
Null Hypothesis	DF	Chi-square	Probability
GDP does not Granger Cause EXP	2	3.8462	0.146
EXP does not Granger Cause GDP	2	12.925	0.002

Table 5

The test results indicate that, change in the growth rate of GDP is caused by change in the growth rate of exports. Furthermore, change in the growth rate of exports is not caused by variations in the GDP growth rate. The causality in this case is one way.

Granger causality Wald tests; Exports and GDPLEXP			
Null Hypothesis	DF	Chi-square	Probability
GDPLEXP does not Granger Cause EXP	2	2.1445	0.342
EXP does not Granger Cause GDPLEXP	2	3.927	0.001

Table 6

The test results indicate that, change in the growth rate of GDPLEXP is caused by the growth rate of exports. And also the change in the growth rate of exports is not caused by growth of GDPLEXP. The causality in this case is one way.

Granger causality Wald tests; Exports and RGCF			
Null Hypothesis	DF	Chi-square	Probability
RGCF does not Granger Cause EXP	2	1.4331	0.488
EXP does not Granger Cause RGCF	2	5.1884	0.075

Table 7

The test results indicate that, change in the growth rate of RGCF is caused by the growth rate of exports. And also the change in the growth rate of exports is not caused by growth of RGCF. The causality in this case is one way.

5.4 Vector Autoregression [VAR] Model Estimation

VAR model is used to show the dynamic effect of the impact of unitary shocks on a variety of macroeconomic variables. The study uses first differences data values, since the variables are neither stationary nor cointegrated. The VAR model is used to analyze the interrelationship between variables in short run by capturing the effects of current and past values of variables Kahya (2011). VAR model estimation shows the relationship among variables and indicates the extent to which they affect each other based on past and current values.

5.4.1. VAR Model Estimation [GDP, Exports]

The model hypothesizes that GDP is a function of exports, imports and investment. Other factors that affect GDP are not included in this model because we would like to examine in isolation primarily the causal relationship between economic growth and foreign trade. Determining number of lags to be used in VAR estimation is crucial. In particular, we use LR test value as the primary determinant for lag length selection in VAR model and use the Akaike's Information Criterion (AIC) as a complement to the Likelihood-Ratio Test (LR).

Selection-order criteria								
Sample: 1979 - 2012					Number of obs. = 34			
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	142.636				3.4e-09	-8.15503	-8.09379*	-7.97546*
1	160.825	36.378	16	0.003	3.0e-09	-8.2838	-7.97761	-7.38594
2	179.578	37.506*	16	0.002	2.7e-09*	-8.44575*	-7.8946	-6.8296
3	190.217	21.28	16	0.168	4.1e-09	-8.13044	-7.33433	-5.79601
4	202.459	24.484	16	0.079	6.4e-09	-7.90937	-6.86831	-4.85665
Endogenous: dgdpxdpdimpdrpcf								
Exogenous: _cons								

Table 8

For this analysis the number of lags is also defined as two according to the Likelihood-Ratio Test and Akaike's Information Criterion (AIC). We proceed to estimate VAR model with two lags.

VAR Model Estimation results					
	VARIABLE	COEF.	STD. ERR.	Z	P>|Z|
DGDP	DGDP L1.	-.0721936	.1964309	-0.37	0.713
	L2.	-.3781031	.2206187	-1.71	0.087***
	DEXP L1.	.0053152	.2397556	0.02	0.982
	L2.	.0022608	.2408827	0.01	0.993
	DIMP L1.	.4963931	.2357469	2.11	0.035***
	L2.	.139169	.2339577	0.59	0.552
	DRGCF L1.	-.0081396	.047788	-0.17	0.865
	L2.	.0283099	.0466882	0.61	0.544
	_CONS	.0018022	.0111545	0.16	0.872
	DEXP	DGDP L1.	.3602995	.1521628	2.37	0.018***
L2.		-.3908002	.1708996	-2.29	0.022***
DEXP L1.		.2396958	.1857237	1.29	0.197
L2.		-.481209	.1865968	-2.58	0.010***
DIMP L1.		.1544259	.1826185	0.85	0.398
L2.		.2133132	.1812325	1.18	0.239
DRGCF L1.		.0429689	.0370184	1.16	0.246
L2.		-.0081736	.0361665	-0.23	0.821
_CONS		.0121345	.0086407	1.40	0.160
DIMP		DGDP L1.	.3935834	.156613	2.51	0.012***
	L2.	-.4409341	.1758978	-2.51	0.012***
	DEXP L1.	.3229156	.1911555	1.69	0.091***
	L2.	-.4541489	.1920541	-2.36	0.018***
	DIMP L1.	.283399	.1879595	1.51	0.132
	L2.	.0980459	.1865329	0.53	0.599
	DRGCF L1.	.0230114	.0381011	0.60	0.546
	L2.	.0434951	.0372242	1.17	0.243
	_CONS	.0181384	.0088934	2.04	0.041***
	DRGCF	DGDP L1.	1.833217	.6854746	2.67	0.007***
L2.		-.0991273	.7698817	-0.13	0.898
DEXP L1.		-1.661565	.8366626	-1.99	0.047***
L2.		.1716472	.8405958	0.20	0.838
DIMP L1.		2.329258	.8226739	2.83	0.005***
L2.		-1.537959	.81643	-1.88	0.060***
DRGCF L1.		-.3255846	.1667634	-1.95	0.051***
L2.		.0398124	.1629254	0.24	0.807
_CONS		-.0047326	.0389254	-0.12	0.903

Table 9

Although the coefficients are positive for the two lags of exports, the results above reveal that past levels of exports have failed to explain the growth of GDP since the results are insignificant even at 10% level. The results indicate that the past level (only lag 1) of imports positively affect the level of GDP growth. In addition, past investment levels have failed to explain the variations in GDP.

Past levels of GDP considerably explain variations in export growth. However, at lag 1 there is a positive impact while at lag 2 a negative impact is observed. This implies that more current growth policies have a positive impact on export growth. Growth in imports and capital formation have also failed to provide sufficient explanation for export growth patterns.

Past levels of GDP and exports have been found significant in explaining import growth. For both variables, first lags have positive impact, while second lags have shown negative impact. Past levels of all other variables have been found to have an effect on current levels of gross capital formation. This implies that when contemplating alterations to the investment level, particular attention should be paid to the other variables in question.

5.4.2. VAR Model Estimation [GDP without Export, Exports]

The study also seeks to examine the impact of past levels of exports on GDP without exports and also vice versa.

Selection-order criteria								
Sample: 1979 - 2012								
Number of obs = 34								
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	129.404				7.4e-09	-7.3767	-7.31546*	-7.19713*
1	148.314	37.82	16	0.002	6.2e-09	-7.54787	-7.24168	-6.65001
2	167.298	37.968*	16	0.002	5.5e-09*	-7.72342*	-7.17226	-6.10727
3	178.722	22.847	16	0.118	8.0e-09	-7.45421	-6.6581	-5.11978
4	191.756	26.068	16	0.053	1.2e-08	-7.27974	-6.23868	-4.22702

Endogenous: dgdplexp dexp dimp drgcf, Exogenous: _cons

Table 10

The LR and AIC have indicated the lags to be two, and these will be used in the VAR estimation.

VAR Model Regression results						
	VARIABLE		COEF.	STD. ERR.	Z	P>Z
DGDPLEXP	DGDPLEXP	L1.	-0.22092	0.179247	-1.23	0.218
		L2.	-0.30463	0.208233	-1.46	0.143
	DEXP	L1.	-0.1819	0.313067	-0.58	0.561
		L2.	0.143936	0.324558	0.44	0.657
	DIMP	L1.	0.630748	0.313278	2.01	0.044***
		L2.	0.08305	0.30909	0.27	0.788
DEXP	DRGCF	L1.	-0.0184	0.063886	-0.29	0.773
		L2.	0.047424	0.061806	0.77	0.443
	_CONS		-0.00149	0.014831	-0.1	0.92
	DGDPLEXP	L1.	0.235782	0.104371	2.26	0.024***
		L2.	-0.272	0.121249	-2.24	0.025***
	DEXP	L1.	0.342838	0.182292	1.88	0.06***
DIMP		L2.	-0.58517	0.188982	-3.1	0.002***
	DIMP	L1.	0.170595	0.182414	0.94	0.35
		L2.	0.207701	0.179976	1.15	0.248
	DRGCF	L1.	0.046657	0.037199	1.25	0.21
		L2.	-0.00984	0.035988	-0.27	0.784
	_CONS		0.011659	0.008636	1.35	0.177
DGRCF	DGDPLEXP	L1.	0.260847	0.106769	2.44	0.015***
		L2.	-0.30999	0.124034	-2.5	0.012***
	DEXP	L1.	0.437318	0.186479	2.35	0.019***
		L2.	-0.57171	0.193323	-2.96	0.003***
	DIMP	L1.	0.300581	0.186605	1.61	0.107
		L2.	0.090769	0.18411	0.49	0.622
DGRCF	DRGCF	L1.	0.027119	0.038054	0.71	0.476
		L2.	0.042087	0.036815	1.14	0.253
	_CONS		0.017604	0.008834	1.99	0.046***
	DGDPLEXP	L1.	1.265474	0.467499	2.71	0.007***
		L2.	-0.0779	0.543098	-0.14	0.886
	DEXP	L1.	-1.14291	0.816519	-1.4	0.162
DGRCF		L2.	0.179515	0.846488	0.21	0.832
	DIMP	L1.	2.364654	0.817069	2.89	0.004***
		L2.	-1.52995	0.806146	-1.9	0.058***
	DRGCF	L1.	-0.31859	0.166623	-1.91	0.056***
		L2.	0.041647	0.161197	0.26	0.796
	_CONS		-0.00624	0.038682	-0.16	0.872

Table 11

The above results show that only lagged values of imports affect the growth rate of GDP (without exports). Past values of net GDP do have an impact on export growth. Lag 1 has a positive impact while lag 2 has a negative impact on export growth. Growth of imports have also been shown to respond to changes in the growth rate of net GDP and exports.

5.5 Stability Test And Autocorrelation Test

To check on the efficiency and reliability of the regression results, stability test and autocorrelation tests have been undertaken.

Eigenvalue		Modulus
.4705982 + .5281408i	.707386	
.4705982 - .5281408i	.707386	
-.2560597 + .6281167i	.678305	
-.2560597 - .6281167i	.678305	
-.4467361 + .4615695i	.642355	
-.4467361 - .4615695i	.642355	
.2841533 + .2745283i	.395106	
.2841533 - .2745283i	.395106	

All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.

Table 12

The stability test indicates that the model is very stable.

Autocorrelation			
Lagrange-multiplier test			
lag	chi2	df	Prob> chi2
1	13.9452	16	0.60280
2	13.5768	16	0.63021

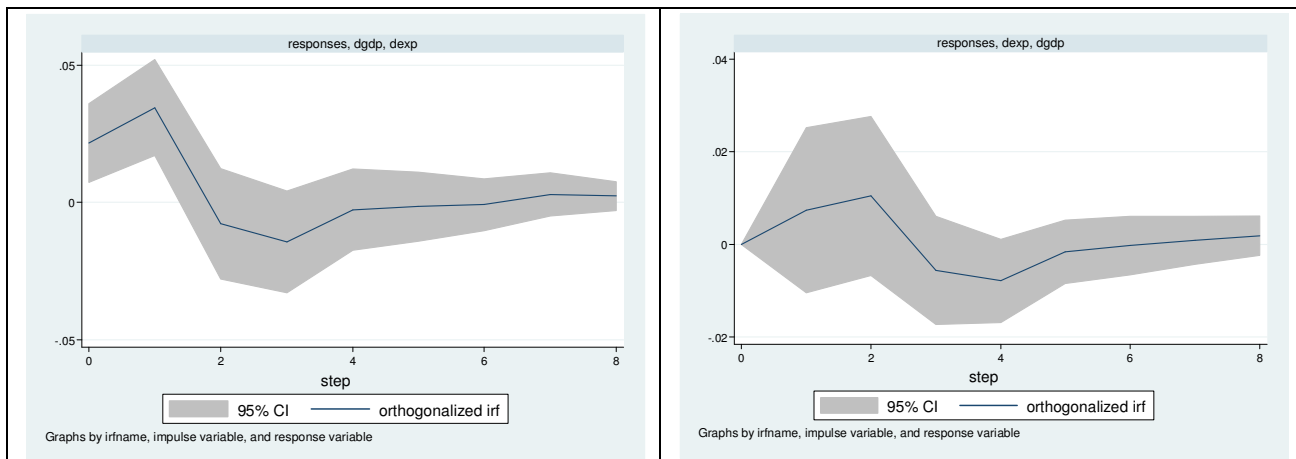
H0: no autocorrelation at lag order

Table 13

No autocorrelation is detected, hence the study results are reliable for policy analysis. No further adjustment is needed for our data to produce unbiased results.

5.6 Impulse Response Function

The employment of IRF aims at understanding how a sudden and unexpected change in one variable impacts another variable over time. The variables to be considered are exports, GDP, Gross Capital Formation, and GDP without exports. Most fascinating is the relationship of the exports variable in relation to other variables. The study will use impulse response functions, as they show the effects of shocks on the adjustment path of the variables. Simply put, an Impulse Response Function (IRF) shows how an unexpected change in one variable at the beginning affects another variable through time. The study manipulates the IRF to examine how unexpected changes which directly affect export levels affect GDP and investment levels, and the reverse is also applied.



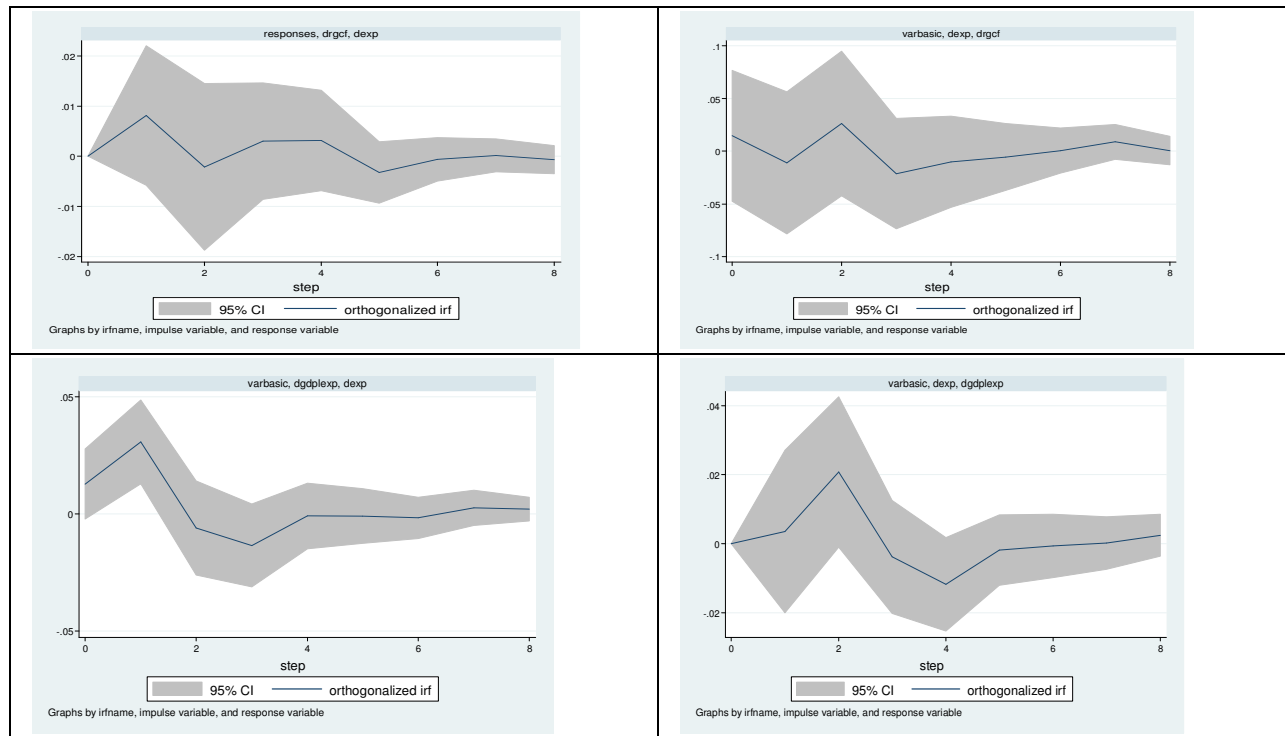


Figure 5

From the above graphs, the blue line represents the impulse response function and the grey band is the 95% confidence interval for the IRF. The graph of GDP and export, shows that an increase in GDP causes an increase in exports in the short run (though insignificant in the first quarter). The growth of exports positively impacts GDP in the short run in the first quarter followed by a negative impact experienced in the second quarter, and this behavior is found to be significant. However, the large confidence interval which includes zero indicates that after an unexpected increase in exports, the increase in GDP may or may not materialize.

Considering investment and export, the effect of an unexpected increase in investment is an immediate impact on export levels and these effects stretch over the one year period. After the initial increase in investment levels another spike in investment is expected a year later. This is because feedback effects of the initial shock reverberate throughout the economy. For exports, the IRF shows that an initial increase is likely to cause investment levels to fall but only for a year. As with export growth and GDP, the large confidence interval which includes zero indicates that after an unexpected increase in exports, the increase in investment may or may not materialize.

As for net GDP and exports, the impact is almost the same. The unexpected change in one variable, initially causes a rise in the other variable upto the first quarter before a fall is observed afterwards. The effects resembled are significant. Like the other relationships afore analysed, the large confidence interval which includes zero indicates that after an unexpected increase in exports, an increase in net GDP may or may not materialize.

The IRFs results have been shown to be significant, implying that unexpected changes in one variable have a significant impact on the levels of the other. The results are more significant in the long run. However, the impact of sudden changes in exports have been shown with a large confidence interval, implying that the expected outcome may or may not materialize. This poses considerable challenges in drawing solid conclusions on the impact of the export sector growth.

5.7 Longrun Relationship (Vector Error Correction Model)

To explore the long-run relationship between GDP, export and import, the VEC estimation is adopted. In this estimation we use one lag less than the lags used in the VAR model.

5.7.1. Considering Real GDP (VEC Regression Results)

Identification: beta is exactly identified					
Johansen normalization restriction imposed					
beta |	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
dgdpl	1	.	.	.	.
dexpl	.242556	.2978608	0.81	0.415	-.3412404 .8263524
dimpl	-1.732577	.2752685	-6.29	0.000	-2.272093 -1.193061
drgcfl	.3958647	.0541025	7.32	0.000	.2898256 .5019037
_cons |	.0199294	.	.	.	.

Table 14

The above shows that imports and GDP are significantly correlated whereas exports are shown not to be significantly related to GDP. Therefore, similar to the results of VAR model, we fail to find any significant relationship between export and GDP in the long-run.

5.7.2. Considering Real GDP without exports (VEC Regression Results)

Identification: beta is exactly identified					
Johansen normalization restriction imposed					
beta l	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
dgdplexp l	1	.	.	.	.
dexp l	.6291145	.3503331	1.80	0.073	-.0575258 1.315755
dimp l	-2.047679	.3237609	-6.32	0.000	-2.682239 -1.413119
drpcf l	.4144756	.0636334	6.51	0.000	.2897563 .5391948
_cons l	.0220592	.	.	.	.

Table 15

Considering GDP without the export component, the data shows a significant long run relationship between exports and GDP. Similarly, there is a significant relationship between imports, investment and GDP in the long run.

6. Conclusion and Policy Implications

The relationship between economic growth and international trade remains central in most research agenda formulation in the discipline of economics. Many studies have been carried out to express the trade and economic growth relationship with empirics giving varying results. Trade indeed promotes economic growth in a country, but how significant is it in propelling the economy, especially when the trade components are separated into imports and exports. Many classical economic theories by Adam Smith, David Ricardo, Torrens, James Mill and John Stuart Mill have indicated that trade contributed to economic growth, Ugur (2008). The study seeks to contribute to literature pertaining developing nations, scenario, to the export-economic growth nexus.

The main objective of this study has been to analyze the relationship between exports and economic growth in Zimbabwe during the last three decades. The study incorporated imports and real gross capital formation in the analysis of export and economic growth. Various methodologies were manipulated to achieve objectives of this study. The research engaged unit root tests, cointegration tests, granger causality tests, vector autoregression, impulse response functions and vector error correction model, in an effort to determine the various dynamics of export-led growth in Zimbabwe.

Time series data are found to be non-stationary and transformed into their first differences in order to make them stationary. Cointegration test applied indicated that the variables are not cointegrated. The Granger causality test, indicated that export growth does not lead to growth in GDP, while the growth of GDP was found to cause growth in exports. The study found a one-way causality between exports and economic growth as measured by GDP. This was confirmed by the results of the VAR model which reveal an insignificant relationship between exports and GDP. The outcomes of the VAR model confirm that it is GDP that causes export growth, and not vice-versa. In theory, it is widely argued that there is a two-way causal relationship between export and economic growth, Ugur (2008). Similarly, the long run relationship between exports and GDP is examined using VEC model and an insignificant relationship between the two is revealed. Analyzing GDP without exports found that exports do not cause growth in GDP (Granger causality and VAR). However, VEC model found a significant long run relationship, which implies that in the long run export growth has an impact on economic growth.

Export growth is found to cause investment growth. This is confirmed by the results of the granger causality test, and the VAR model regression. A one-way causality is found between the two variables. Growth in the export sector is observed to have an impact on the import sector. However, the reverse is not true, imports growth has no significant impact on exports growth.

The study concludes that during the period under study, economic growth in Zimbabwe did not depend on the growth of export, but it relied mostly on the growth of imports and growth of real capital formation. Through impulse response functions it has been detected that unexpected changes in export levels have no significant impact to affect GDP levels in the short run. The IRFs have indicated that the sudden changes in the export sector's effect on other variables may or may not materialize, making it hard for the study to give a solid conclusion on the impact of the export sector to economic growth and investment.

As was observed by Derosa (1992), Zimbabwe like many other low income countries with abundant natural resources rely heavily on exports of primary commodities for foreign exchange earnings. International prices for primary commodities, however, tend to be highly variable, creating considerable uncertainty about the export proceeds being earned from one year to the next. For the export sector to contribute significantly to economic growth, there is need for export diversification and as this stabilizes the level of export earnings. Furthermore, value addition to exports is highly crucial to increase export earnings. Policy makers in Zimbabwe should therefore implement sound macroeconomic policies to stabilize the economy and expand production for export purposes.

Zimbabwe's poor macroeconomic and institutional environment lowers its competitiveness compared to other countries in the region. The country has massive export potential and needs to take appropriate measures to improve its competitiveness to exploit its potential. As insisted by Chigumira (2013), in his presentation, the economy should engage in global value chain, which enables value addition to exports. Enterprises, institutions and policymakers all play a role in supporting the country's quest to become a credible competitor in exports. The concept is greatly advocated for by Muranda (2003), indicating that although government policies towards private

sector investment and promotion of exports of non-traditional goods are important to stimulate exports, it is equally important to ensure that the produced goods are able to compete internationally in terms of quality and prices.

7. References

- i. Abou-Stait, F, (2005) "Are Exports the Engine of Economic Growth? An Application of Cointegration and Causality Analysis for Egypt, 1977-2003", African Development Bank, Economic Research Working Paper, No 76.
- ii. Afonso, O., (2001) "The Impact of International Trade on Economic Growth", Universidade do Porto Working Paper 106.
- iii. Balassa, B., (1978) "Export and economic growth: further evidence", *Journal of Development Economics* 5(2), 181-189.
- iv. Balassa, B., (1982) "Disequilibrium analysis in developing economies: an overview", *World Development*, vol. 10, no. 12 pp. 1027-1038.
- v. Balassa, B., (1985) "Exports, policy choices, and economic growth in developing countries after the 1973 oil shocks", *Journal of Development Economics* 18, 23-25.
- vi. Baldwin, R.E, Forslid, R, (1996) "Trade liberalisation and endogenous growth: A q-theory approach", NBER Working Paper No. 5549.
- vii. Basu, S.R and Das, M, (2011) "Export Structure and Economic Performance in Developing Countries: Evidence from Nonparametric Methodology", *Policy Issues in International Trade and Commodities, Study Series no. 48*.
- viii. Chaudhry, A. and Hyder, K, (2012). "A Structural VAR Analysis of Pakistan's Textile Exports", *Middle-East Journal of Scientific Research*, vol. 12 (4): 464-478.
- ix. Chigumira, G, (2013), *Role of Value Chains in Export Development & Competitiveness*, 24 October 2013, Harare, ZIMTRADE Exporters Conference.
- x. Chigusiwa L, Bindu S, Mudavanhu V, Muchabaiwa, L and Mazambani D, (2011) "Export-Led Growth Hypothesis in Zimbabwe: Does Export Composition Matter?", *International Journal of Economics. Res.*, 2011 2(4), 111 – 129.
- xi. Derosa, D.A, (1992) "Increasing Export Diversification in Commodity Exporting Countries: A Theoretical Analysis", *IMF Staff Papers*, vol. 39, no. 3.
- xii. Dollar, D. and Kraay, A. (2001) "Trade, Growth and Poverty", *IMF Finance and Development Quarterly Magazine* 38(3).
- xiii. Dollar, D. and Kraay, A., (2001), *Growth is Good for the Poor*, World Bank Policy Research Department Working Paper 2587. Available at <http://www.worldbank.org/research/growth>. [Accessed 10 November 2014].
- xiv. Ekanayake E.M, (1999) "Exports and Economic Growth in Asian Developing Countries: Cointegration and Error-Correction Models", *Journal of Economic Development*, vol.24, no. 2.
- xv. Feder, G., (1982) "On export and economic growth", *Journal of Development Economics*, 12: 59-73.
- xvi. Feenstra, R.C, (1990) "Trade and Uneven Growth," *National Bureau of Economic Research Working Papers* 3276.
- xvii. Grossman, G.M and Helpman, E, (1990) "Product Development and International Trade", NBER Working Paper No. w2540.
- xviii. Gunter, B.G., Taylor, L. and Yeldan, E. (2005) "Analysing Macro-Poverty Linkages of External Liberalisation: Gaps, Achievements and Alternatives", *Development Policy Review*, vol. 23, issue 3, p285-298. <http://documents.worldbank.org/curated/en/1982/01/828118/disequilibrium-analysis-developing-economies-overview>
- xix. Kahya, M., (2011), *An analysis of the relationship between foreign trade and economic growth in Turkey over the period 1980-2009*, MSc Thesis, Lund University.
- xx. Kumar, N. and Siddharthan N.S, (1993) "Technology, Firm Size and Export Behaviour in Developing Countries: The Case for Indian Enterprises", *UNU/INTECH Working Paper No. 9*.
- xxi. Li, W., Wang, B. and Yun, G, (2009) "The Analysis of Developed and Developing Countries Textile Exports under the Current Trading System", *International Business Research*, vol. 2, no. 2.
- xxii. Lucas, R., (1988) "On the Mechanics of Economic Development, Marshall Lectures", *Journal of Monetary Economics* 22, pp. 3-42.
- xxiii. Luis, A., Rivera-Batiz, Romer, P.M, (1991) "Economic Integration and Endogenous Growth", NBER Working Paper No. 3528.
- xxiv. Mareike, M. and Kennan, J, (2009) "The implications of the global financial crisis for developing countries' export volumes and values", *Working Paper* 305.
- xxv. Milberg, W and Amengual, M, (2008) "Economic development and working conditions in export processing zones: A survey of trends", *International Labour Office, Geneva, Working Paper, No 3*.
- xxvi. Muñoz, S, (2006) "Zimbabwe's Export Performance: The Impact of the Parallel Market and Governance Factors", *IMF Working Paper* 28.
- xxvii. Muranda, Z, (2003) "Relationships Between Firm Characteristics and Export Constraints in SME Exporters", *Zambezia, XXX (i)*.
- xxviii. Nguyen, M.D. and Nguyen A.T, (2011) *Relationship between Sectoral Exports and Economic Growth - A Time Series Econometric Analysis for Vietnamese Fishery Sector 1997 – 2008*, Nong Lam University, Thuduc, Hochiminh City, Vietnam.
- xxix. Nicita, A. Miho, S. and Bolormaa, T.K, (2013) "Survival Analysis of the Exports of Least Developed Countries: The Role of Comparative Advantage", *Policy Issues in International Trade and Commodities, Study Series no. 54*.
- xxx. Omoke, P.C, (2010) "The Estimation of Long run Relationship between Economic Growth, Investment and Export in Nigeria" *International Journal of Business and Management*", vol. 5, No. 4; April.

- xxx. Ricardo, N.B. and Berrettoni, N.D, (2006) "Explaining Export Diversification: An Empirical Analysis", CAF Research Program on Development Issues.
- xxxii. Riezman, R., Whiteman, C.H. and Summers, P.M., (1996) "The engine of growth or its handmaiden? A time series assessment of export led growth", *Empirical economics* 21, no 1:77-110.
- xxxiii. Rodriguez, F. and Rodrik, D., (2000) "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence" In: Bernake, B. and Rogoff, K. (eds). National Bureau of Economic Research Macro Annual.
- xxxiv. Romer, P.M. (1986) "Increasing Returns and Long-Run Growth", *Journal of Political Economy* vol. 94(5) pp. 1002-1038.
- xxxv. Sachs, J.D. and Warner, A, (1995), *Economic Reform and the Process of Global Integration*, Brookings Papers on Economic Activity 1, pp. 1-118.
- xxxvi. Segerstrom, Paul, Anant, T and Dinopoulos, E, (1990) "A Schumpeterian Model of the Product Life Cycle", *American Economic Review*, vol. 80, p. 1077-1091.
- xxxvii. Shah, D, (2008) "Horticultural Exports of Developing Countries: Issues under WTO Regime", *Economic Analysis Working Papers*, vol. 7, no. 2.
- xxxviii. Sharma, A. and Panagiotidis, T., (2005) "An Analysis of Exports and Growth in India: Cointegration and Causality Evidence", *Review of Development Economics*, vol. 9, issue 2, p.232.
- xxxix. Sinha, D, (1999) "Export Instability, Investment and Economic Growth in Asian Countries: A Time Series Analysis", Yale University, Center Discussion Paper, No. 799.
- xl. Soprana, M. (2011) *Services exports and developing countries: competitiveness challenges according to mode of supply*, MILE 11 Thesis, World Trade Institute.
- xli. Uğur, A, (2008) "Import and Economic Growth in Turkey: Evidence from Multivariate VAR Analysis", *Journal of Economics and Business*, vol. XI, No 1 & No 2.
- xlii. Wacziarg, R. and Welch, K.H, (2002) "Trade Liberalisation and Growth: New Evidence", National Bureau of Economic Research Working Paper 10152.