The impact of export on economic growth in Sri Lanka: A time series analysis

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Introduction

Economic growth is a most important determinant for the sustainable development in a country and it affects directly the economic welfare. There are some factors mainly affect the economic growth; human resources, natural resources, capital formation, technological development, social and political factors, international trade and foreign direct investment. Among those factors, export is a significant factor that affects the economic growth of the country. Exports are the goods and services that are made in one country and transmitted to foreigners. In the Sri Lanka economy, export is playing a major role in international trade. In 1977, Sri Lankan closed economy had moved to the open economy and began to deals in the international market. Sri Lanka's most dynamic industries now are food processing, textiles and apparel, food and beverages, telecommunications, and insurance and banking (Herath, 2013).

Several studies have investigated the impact of exports on economic growth. The findings of some studies indicate that exports have a positive impact on economic growth. Also, some studies state that, there is no strong evidence to support for short-run causality running from export growth to economic growth (Ekanayke, 1999). Shihab et al. (2014) examined the causal relationship between economic growth and exports in Jordan using the Granger Causality test using data of the period 2000-2012. The study found that, there is a causal relationship running from the economic growth to export, and not vice versa. Zaheer et al. (2014) investigated the relationship between GDP growth rate and exports and imports using Multiple Regression models and the results indicated that it can only increase its economic growth by exporting more and more goods to foreign countries in order to earn foreign exchange reserves which can then be used to import those items which are relatively scarce in Pakistan. The result also indicated that both exports and imports have a significant relationship with economic growth rate. They suggested that government should move towards more exchange rate liberalization policy in order to increase its economic growth. Dilrukshini (2006) examined the validity of the export-led growth hypothesis (ELG) for Sri Lanka using annual data over the period 1960-2005, employing time-series analysis techniques of cointegration, causality, Vector Auto-

Regressive (VARs) and Impulse Response Functions (IRFs). The study controlled other macroeconomic variables that might have a significant effect on export-economic growth relationship. The findings do not provide empirical support for the export-led growth hypothesis for Sri Lanka. Thus, the literature on exports and economic growth is inconclusive and different from one nation to other. In addition, there are limited studies conducted in the Sri Lankan context. Therefore, this study aims to examine the impact of export on economic growth in Sri Lanka.

Methodology

Time series analysis was used to examine the impact of export, import, Foreign Direct Investments (FDIs) and Government expenditure on the GDP Growth of the country. The data were gathered from annual reports of Central Bank of Sri Lanka from 1977 to 2016. Following econometric model was specified to the study:

$$lnY_i = \beta_o + \beta_1 lnX_{1i} + \beta_2 lnM_{1i} + \beta_3 lnFD1i + \beta_4 lnG1i + U_i$$

In this model, all variables are in the logarithm form. Where: Y is
Dependent variable (Economic Growth), X is Export, M is Import,
FD is a foreign direct investment, G is Government expenditure
and Ui is Error term.

Unit root test was applied to test for the stationery of the time series data by using Augmented Dickey-Fuller (ADF) test. Johansen Cointegration test was utilized to find out the long run relationship between export and economic growth rate. Vector Error Correction Model (VECM) was then used to find out the short-run impact of independent variables on the dependent variable. To identify a causal relationship between export and economic growth Granger Causality Test was employed.

Table 1 Results of unit root test

Variable	1st Difference(with Intercept)			1st Difference(with Trend & Intercept)			1st Difference(with None)		
Null Hypoth esis	Statistic	Critica l value	p value	ADF	Critica l value	p value	Statistic	Critica l value	p valu(
GDP	-9.770	-2.941	0.000	-9.635	-3.533	0.000	-9.901	-1.949	0.000
EXPO	-5.711	-2.943	0.000	-5.750	-3.536	0.000	-4.937	-1.949	0.000
IMPO	-6.068	-2.941	0.000	-6.027	-3.533	0.001	-4.994	-1.949	0.000
FDI	-21.330	-2.941	0.000	-19.854	-3.533	0.000	-21.915	-1.949	0.000
EXPE	-7.078	-2.941	0.000	-6.994	-3.533	0.000	-2.483	-2.483	0.014

Results and discussion

The ADF test was used to test the stationary of the data series and Lag values were determined on the basis of the Akaike Information Criterion (AIC). Table 1

shows the result of unit root test. The results indicate that all the data series are stationary at their first difference $I(1)$. Under VAR Lag Order Selection Criteria, all the five criteria suggested that most suitable lag length is Lag1. Therefore Lag 1 is selected as an optimum lag value under AIC. As all the data series were stationary at their first difference, the Johansen cointegration test is used to examine the long run equilibrium of the variables. The results are presented in Table 2.

Table 2 Results of Johansen Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None *	0.612743	77.93705	69.81889	0.0097
At most 1	0.494841	41.88771	47.85613	0.1619
At most 2	0.287744	15.93821	29.79707	0.7166
At most 3	0.076908	3.044109	15.49471	0.9649
At most 4	8.22E-05	0.003122	3.841466	0.9538

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

The results reveals that that there is one cointegration equation between the variables under consideration at 0.05 significance level. Accordingly, the variables are cointegrated and there is a equilibrium relationship between these variables. Therefore the VECM model was used to examine the short run dynamic relationship between the variables. The results are shown in Table 3

Table 3 VECM results

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.121805	0.125081	-0.973812	0.3377
C(2)	-0.307579	0.184804	-1.664351	0.1061
C(3)	0.436039	1.040820	0.418937	0.6782
C(4)	-0.827320	0.919815	-0.899442	0.3754
C(5)	0.043186	0.048070	0.898410	0.3759
C(6)	-0.439702	1.079482	-0.407327	0.6866
C(7)	0.035261	0.120304	0.293099	0.7714

As shown in Table 3, C(2), C(3), C(4), C(5), C(6) are the coefficients that are relevant to the short run equation. But the all 'p' values associated with the coefficients are not significant at 0.05 level. Thus, there is no short-run relationship between export, import, FDI, and government expenditure with GDP growth.

As displayed in Table 4, no statistical indication is found to suggest that the exports Granger cause the real GDP or vice versa. Nevertheless, at 0.05 significance level it can be suggested that FDI Granger cause imports. However,

the import also does not Granger cause to the FDI at 0.05 or 0.05 level of significance. Therefore, these findings do not provide direct support for the causal relationship between exports and GDP and relationships other variable as well.

Table 4 Granger Causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
LEXPOD1 does not Granger Cause LGDPD1	38	0.24657	0.6226
LGDPD1 does not Granger Cause LEXPOD1		0.30515	0.5842
LIMPOD1 does not Granger Cause LGDPD1	38	1.33800	0.2552
LGDPD1 does not Granger Cause LIMPOD1		0.42598	0.5182
LFDID1 does not Granger Cause LGDPD1	38	0.00016	0.9900
LGDPD1 does not Granger Cause LFDID1		0.00631	0.9371
LEXPED1 does not Granger Cause LGDPD1	38	1.64903	0.2075
LGDPD1 does not Granger Cause LEXPED1		0.54880	0.4638
LIMPOD1 does not Granger Cause LEXPOD1	38	1.90638	0.1761
LEXPOD1 does not Granger Cause LIMPOD1		0.04689	0.8298
LFDID1 does not Granger Cause LEXPOD1	38	0.12801	0.7226
LEXPOD1 does not Granger Cause LFDID1		0.04436	0.8344
LEXPED1 does not Granger Cause LEXPOD1	38	0.44166	0.5107
LEXPOD1 does not Granger Cause LEXPED1		1.43323	0.2393
LFDID1 does not Granger Cause LIMPOD1	38	6.37687	0.0162*
LIMPOD1 does not Granger Cause LFDID1		1.06765	0.3086
LEXPED1 does not Granger Cause LIMPOD1	38	1.22047	0.2768
LIMPOD1 does not Granger Cause LEXPED1		1.72989	0.1970
LEXPED1 does not Granger Cause LFDID1	38	0.21676	0.6444
LFDID1 does not Granger Cause LEXPED1		1.13753	0.2935

*significant at 5%

Conclusion

This study examined the impact of export on the economic growth of Sri Lanka using annual data of the time period 1977-2016 by using time series analysis. This study focused on identifying the long run and short run association and causal relationship among the macroeconomic variable that might have a significant impact on economic growth. The results revealed that export, import, FDI, government expenditure and GDP are cointegrated and a presence of long-run equilibrium relationship among all these variables. However, results do not show any evidence to establish short run relationship between the variables, more especially in between export to the GDP growth in Sri Lanka. These results are par with the findings of the studies that have been conducted in similar contexts (Ekanayake, 1999; Dilrkshini, 2006)

Keywords: Economic growth, export, international trade, investment.

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