



The Determinants of Export Performance: The Case of Sri Lanka

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Abstract

This empirical study investigates the determinants of the export performance of Sri Lanka over a period 1980 to 2013. As determinants, the study takes five factors such as gross capital formation, foreign direct investment, interest payment on foreign debt, import, weighted average of per-capita income of the export destination countries into consideration. As a first step, the Unit root analysis is employed to test stationary properties of the variables. As a second step, Johansen's Co-integration maximum likelihood method is employed to test the long run relationship among the non-stationary variables. As a third step, the Vector Error Correction Model was employed to describe the dynamic interrelationship among the variables. The results derived from this study suggest that all variables are significantly influencing on the export in the long run. In the long run, foreign direct investment, interest payment on foreign debt and import are found to have a positive impact, whereas gross capital formation and per capita income of the export destination countries have a negative impact. Foreign direct investment and per capita income of export destination countries significantly affect in the short run whereas import, gross capital formation and interest payment for debts are insignificant.

Keywords: Export, Sri Lanka, Co-integration, Import, FDI, Debt, Capital Formation.

Introduction

International trade is the back born of global economy brings together a numerous advantages to the trade partnering countries that are becoming rich and wealthy. Especially, the countries that have sound export performance gradually improve their economic performances. Because export plays a vital role in an economy influencing on the performance of balance of payment, level of employment and economic growth through enhancing aggregate demand. However, the export performances of the countries are influenced by a number of factors with different level of magnitude. Literature of empirical studies has already produced a wide range of analytical techniques and findings that varies depending on the characteristics of the economies. At this juncture, this study focuses investigating the determinants of the export performance of Sri Lankan economy taking attempt to fulfill the gap and producing output to the literature.

Sri Lanka is ranked as the 87th largest export economy in the world and known as a major exporter of tea, garment and textiles, and rubber products. However, as far as the overall performance of trade is concerned, Sri Lanka has been experiencing trade deficit for past several years. The trend of deficit is driven by declining exports and more than ever the difference between exports and imports expands from past recent years. For instance, export was at 33.3% of GDP, but it hit the record of 16.8% in 2012. Though successive governments and respective authorities have been taken several steps to overcome this issue, the outcome has been inconclusive. Thus, analyses over the determinants of export are timely

needed and outcome of them would possibly be helpful to the authorities that are very enthusiastic to solve bottlenecks and barriers in terms of export performance. Therefore, this study focuses investigating the long-run and short run influencing factors over the export performance. However, this analysis consists of limited factors as determinants because inclusion of all variables on a theoretical basis is not feasible in these types of studies due to limitations in availability of data and method of analysis employed in this study. Thus, this study considers some selected determinants such as import, foreign direct investment, gross capital formation, interest payment on debt and per capita income of the people of export destination countries which are relatively important when one talk about trade performances. All these determinants, except interest payment for debt, are expected to have a positive association with export performance. However, the trend of long run and short run impacts may vary depending on the performance of macroeconomic condition of the economy.

The export performance of an economy can be import dependent when most of the raw materials and intermediate goods are imported for manufacturing sector. This requirement is unavoidable for a country that has limited resources. However, importance of MNCs is found to be a reason of emerging trade of intermediate goods¹. According to the Miroudot et al.² and Halpern et al.³ higher share of imported inputs leads to productivity gains in domestic industries and reduces inefficiencies in the use of technologies. However, Navas et al.⁴ analyzed the impact of import on export by employing gravity theory and found that imports of intermediate goods positively affect export performance. The authors further

found that the negative effect of distance on export increases with the share of imported intermediate goods. Amighini and Sanfilippo⁵ also found that impact of FDI and imports upgrade African export.

FDI inflow can perform positive contribution to economic growth by improving long-term capital with new technologies, managerial and marketing skills which in turn promote the export performance of the economy^{6,7,8}. However, the impact of FDI on export performance becomes controversial that depending on the motivation of FDI flow such that whether to capture the domestic market or to tap the export market^{9,10}. Shawal and Shen¹¹ analyzed the long run relationship between GDP, FDI and export by employing co-integration and granger causality analysis, and concluded that FDI inflow granger causes export performance. However, Herve et al.¹² studied the prominent factors that affect Zanzibar's export and found that FDI attracted to this country does not encourage export performance. In an analysis of the determinants of export performance in developing countries, Majeed and Ahmand⁹ found a positive but insignificant impact of FDI on exports. According to Hoekman and Djankov¹⁰ FDI changes the export structure of Central and Eastern European countries thereby enhance export by improving the quality of the production.

Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. This is one of the indicators of investment made in the domestic economy¹³. Capital formation is also referred to as enlargement of capital stock which can enhance import substitutes and economic growth by expanding export performance^{14,15,16,17}. Rajni¹⁶ analyzed linkages between export, import and capital formation in India by employing co-integration and granger causality analysis, found that there is a bidirectional causality between gross capital formation and export growth. Dritsakis et al.¹⁸ also found in their analysis that there is a unidirectional relationship between fixed capital formation and export.

The impact of debt on export performance, whether it is negative or positive, is debatable and depending on the macroeconomic performance of a particular country. External debt can serve stimulator enhancing infrastructure in production sectors. This will have a positive impact on economic growth in turn promote export. On the other hand, in order to settle accumulated debt, the tax increase will discourage private investment and government spending on infrastructure development. Further, debt interest payment from income from export will also discourage public investment. According to Solow growth model, these affects will have crowding effect and shift investment and production curves downward. According to Krumma¹⁹ external loans improve productive

capacity of borrowing country, but it is unnecessary to have extra external loans to service the original debt. Supporting this argument Cline and William²⁰ also states that external debt can have a positive impact on economy of the borrowing country if the marginal productivity of external debt is greater than or equal with the principal and the interest payment. Warner²¹ stressed that there is a positive relationship between investment and debt over the 13 less developed countries, and Cohen²² studied the effect of debt on growth taking 81 developing countries into the analysis and concluded that the level of debt cannot explain the decrease in investment in the highly rescheduling countries.

Weighted average of income of foreign partner can be incorporated to study income elasticity of demand. Foreigners' income serves as one of the pulling factors that encourage exports performance of particular economy. Narayan and Narayan²³ investigated the determinants of export performance in Fiji by employing the ARDL model among which they found that foreign income has a positive impact on export demand in Fiji. Skosan et al.²⁴ also emphasize world income as a key factor in determining export performance of Swaziland. On the contrary, Tovonjatovo and Dong²⁵ stated in their analysis that world income has a weak positive influences on the export growth rate in the case of Madagascar whereas Anas et al.²⁶ found that the world income does not significantly explain export performance in the case of Indonesia.

Methodology

The secondary time series annual data on variables, running from 1980 to 2013, were drawn from World Bank Development Indicators (WDI) database. As a first step, Unit root analysis was performed in order to test stationary properties of the variables because variables with non-stationary properties may produce spurious result if regression analysis is employed to test long run elasticities. Therefore, in order to overcome this issue the macroeconomic variables were tested by employing the ADF test method. As a second step, Co-integration Johansen (1995) maximum likelihood method was employed to test the long run relationship among the non-stationary variables used in this study. As a third step, the Vector Error Correction Model (VECM) was employed to describe the dynamic interrelationship among the variables. Therefore, the following model is expressed to analyze the determinants of the export performance of Sri Lanka.

$$\ln ex_t = \beta_0 + \beta_1 Z_{kt} + v_t$$

where: $\ln ex$ indicates the logarithm of export as a percentage of GDP. Z_k and t indicate vector of the k variables and time, respectively. The vector includes log of import as a percentage of GDP, $\ln im$, log of foreign direct investment inflow, $\ln fdi$, log of gross capital, $\ln gc$, log of interest payments on debt, $\ln indebt$ and log of weighted average of per-capita income of the export destination countries, $\ln pcw$.

Results and Discussion

Unit Root Analysis: Most of the macroeconomic time series are trended and therefore there are non-stationary. The problem with non-stationary time series is that the OLS can simply lead to incorrect conclusions. Then the variables will have no real interrelationship²⁷. Therefore, the time series data of selected variables fall into unit root analysis to test stationary properties. Table 1 shows the results of the ADF test of each variable. The optimum Lag length was chosen based upon the Schwarz Criterion (SBIC). The Augmented Dickey-Fuller tests whether a variable follows unit roots having null hypothesis that the variable contains unit root. According to the critical and MacKinnon p-values the null hypothesis cannot be rejected. Therefore, the test results reveal that all variables are not stationary at their level become stationary at their first difference, denoted by I (1).

Co-integration Analysis: As all variables are integrated of the same order, the co-integration analysis can be performed to test the long-run relationship between the variables. Johansen's

multiple-trace test method was adopted in determining the number of cointegrating equations. The optimum lag length was three, selected based upon the Schwarz Criterion (SBIC) method. The trace test statistics is shown in Table-2. In the results, the trace statistics at $r = 0$ of 112.1108 exceeds its critical value of 94.15 therefore the null hypothesis of no co integrating equations is rejected, but not at $r = 1$ indicates that one cointegrating vector exists between the selected macroeconomic variables.

Vector Error Correction Method (VECM): Vector Error Correction Model is a special case of VAR for variables that are stationary at first difference. Since all endogenous variables are stationary at first difference and found to have a vector of co-integrating equation, VECM is employed to study dynamic relationship between the variables. The required post estimation tests such as LM test for autocorrelation in residuals, test for normally distributed residuals and stability condition of VECM, were performed in order to ensure that the VECM results are reliable.

Table-1
Unit root test results

Variables	Test statistic at level	Test static at first difference	Order of Integration
<i>lnex</i>	-0.848	-3.967	I (1)***
<i>lnim</i>	-2.006	-3.817	I (1)***
<i>lnfdi</i>	-2.671	-3.968	I (1)**
<i>lngc</i>	-2.006	-3.817	I (1)***
<i>lnindebt</i>	-2.124	-3.264	I (1)*
<i>lnpciw</i>	-1.489	-4.713	I (1)***
*, **, *** indicate 10%, 5% and 1% significant levels, respectively.			

Table-2
Johansen Tests for Cointegration

Maximum rank (r)	Parms	LL	Eigen value	Trace Statistic	5% Critical Value
0	06	251.84318	.	112.1108	94.15
1	17	274.00625	0.73900	67.7846*	68.52
2	26	288.9119	0.59480	37.9733	47.21
3	33	300.0683	0.49143	15.6605	29.68
4	38	306.2141	0.31097	3.3691	15.41
5	41	307.7357	0.08810	0.3257	3.76
6	42	307.8985	0.00982		

Table-3
Normalized Cointegration Coefficients

Variables	coefficients	Standard Error	t-value	p-value
<i>lnex</i>	1	.	.	.
<i>lnim</i>	-2.2777	0.1128	-20.18	0.000
<i>lnfdi</i>	-0.5166	0.0599	-8.62	0.000
<i>lngc</i>	1.8187	0.1695	10.73	0.000
<i>lnindebt</i>	-0.2485	0.1053	-2.36	0.000
<i>lnpcw</i>	1.9612	0.3333	5.88	0.000
<i>cons</i>	-17.003	.	.	.

Accordingly, Table-3 shows the results of normalized equation. The results reveal that all determinants incorporated into the model are statistically significant at 1% level having a long run relationship. Thus, according to Johansen's method by reversing the signs of the coefficients, the model for Sri Lanka's export can be specified as follows:

$$\ln ex = 17.003 + 2.287 \ln im_t + 0.517 \ln fdi_t - 1.819 \ln gc_t + 0.248 \ln indebt_t - 1.96 \ln pcw_t$$

Since the variables are in logarithms the estimated coefficients can be considered as long run elasticity coefficients. Hence, import, foreign direct investment and interest payment of foreign debt are positively associated with exports in Sri Lanka whereas negative association is found with gross capital formation and per capita income of export destination countries. The import coefficient indicates that 1 % increase in imports is associated with a 2.287 % increase in export. Not surprisingly, Sri Lanka's exports are themselves import-dependent. Its manufacturing supply chains are largely import dependent. Machinery and some other capital goods, intermediate goods such as fertilizer, petroleum, and other raw materials for most of the products in the country are imported. On average, over 80% of import expenditure is accounted for intermediate and investment goods while the percentage of consumer goods is less than 20%.

However, since the post-war growth, the government revenue and exports are heavily reliant on imports (VR, 2013) and trade deficit management becomes a challenging building block to the policy makers. According to the coefficient for foreign direct investment, a 1% increase in FDI inflow would cause exports to be increased by 0.5 %. Empirical studies have explored that there is a positive relationship between foreign direct investments, infrastructure development and economic growth in Sri Lanka²⁸, leading to have a conclusion that FDI plays a significant role in improving export performance in Sri Lanka

through the contribution of infrastructure development. The gross capital formation is found to have a negative influence on export performance reveals that a 1.819 % decrease in export performance is explained by a 1% increase in domestic capital formation. According to the modern economists and certain empirical studies, capital formation promotes economic development through various paths.

However, potential of capital formation is depending upon the economic stability of the countries. Interest payments for debt are found to have a positive influence on export performance that 0.25% of export is explained by a 1% increase in interest payments on debt. Because foreign debt in Sri Lanka can serve as supplementary to the inadequate domestic savings in large scale of infrastructure development, and enhance economic growth leading to positive export performance. However, according to the Central Bank of Sri Lanka, the amount that the Sri Lanka spent on debt repayment and interest has more than doubled over the past years. Weighted average of per capita income of export destination countries is found to have a negative relation to export because it is emphasized that there is no significant product diversification with regard to the Sri Lanka's products. For decades, a major component of Sri Lanka's export performance has been covered by textiles and garments, tea, and rubber products accounted by around 65%, whereas electronic and electrical machinery, food and beverage, diamond, Gem and jewellery, fisheries, spices and coconut based products together accounted around 18%.

Further, as major export destination countries for Sri Lankan products are U.S.A, U.K, Germany, Italy, Belgium, France, UAE, Turkey and India, the export performance is adversely effected due to incidence like financial crises occurred in 2008. Moreover, according to the report of Export Development Board-2015, some major exports such as base metal products, transport equipments, and food and beverage have significantly declined in Western market during the past years.

Table-4
Error Correction Model

Variables	D_Inex	D_Inim	D_Infdi	D_Ingc	D_Inindebt	D_Inpcw
α Coefficients	-0.666***	-0.0188	0.608***	-0.232	-0.184	-0.140***
Standard Errors	0.1787	0.2680	0.2751	0.2263	0.3907	0.0347
T-Statistics	-3.73	-0.07	2.21	-0.10	-0.47	-4.05
*** significant at 1%						

Table-4 shows the results of the Error Correction Model. This technique of speed adjustment parameters explores how quickly the system returns to equilibrium after a random shock. According to the results, the error correction term and coefficients for the variables of foreign direct investment and per capita income of export destination countries are statistically significant at 1% level means that these variables significantly affect export performance in the short run whereas the coefficients for imports, gross capital formation and interest payments for debts are insignificant. The coefficient for D_Inex indicates that the speed of adjustment to the long run equilibrium is significant and can be concluded that 66% of deviation would be eliminated annually.

Conclusion

The objective of this study was to investigate the long run and short run impact of the determinants on the export performance of Sri Lanka over a period 1980 to 2013. Firstly, using Unit root analysis the stationary properties of time series data were tested, and accordingly, as a second step, Johansen's Co-integration analysis was employed in order to investigate the long run relationship among the variables. Thirdly, Vector Error Correction model was employed to study the dynamic relationship between the variables. This study conducted the analyses taking five factors such as gross capital formation, foreign direct investment, interest payment on foreign debt, import, weighted average of per-capita income of the export destination countries into consideration. The results suggested that all determinants incorporated into the model are statistically significant at 1% level having a long run relationship, of which import, foreign direct investment and interest payment on debt have a significant positive influence in the long run, whereas gross capital formation and per capita income of the export destination countries have a negative impact. Since, the variables are in logarithms the estimated coefficients can be considered as long run elasticity coefficients. As far as the short run effects are concerned, foreign direct investment and per capita income of export destination countries significantly effect in the short run, whereas import, gross capital formation and interest payments for debts were found to be insignificant. From the findings, the variables imports, gross capital formation and weighted average of per-capita income of the export destination

countries could be considered as much important factors compared to other factors. However, this study suggests further analyses incorporating more variables such as the real exchange rate and inflation which are excluded.

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