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IMPACT OF TRADE LIBERALIZATION ON EXPORT DEMAND IN SRI LANKA

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ABSTRACT

This study examines the export sector performance and trade liberalization policies of Sri Lanka and estimates the export price and income elasticities. Long run properties of the export demand function was obtained by estimating Engle and Granger cointegration equation while the short run dynamics were analysed via an error correction model. Impact of trade reforms were analysed in two reform periods and the results indicated that country's export performance has come to a momentum after 15 years of major reforms in 1977 with an elastic income of 1.06 and significant price elasticity estimate of 0.29. The results also indicated that any shock to the long run export demand can be corrected at a rate of 0.23 percent annually. These findings suggest that the adoption of changes in export structure, removal of trade barriers and the introduction of good monitory policies would help achieve the real benefit of trade liberalization in Sri Lanka.

KEYWORDS: Export demand function, Income elasticity, Price elasticity, Trade liberalization.

INTRODUCTION

The link between the external trade and trade liberalization policies has recently gained much attention due to the unprecedented economic growth enjoyed by many Asian countries including China, India, Thailand, Malaysia and the Philippines. Among the existing studies on the export performance and trade liberalization reforms, Pacheco-Lopez (2005) and Santos-Paulino and Thirlwall (2004) have reported that recent liberalization attempts in respective sample countries had increased the import expenditure than the export earnings. Depending on the disparities in income elasticities of demand for imports and exports, trade balances are subjected to either improvement or deterioration (Houthakker and Magee, 1969). In some of the studies carried out in Asian countries, Ahmed (2000) estimated the export response function for Bangladesh, and Nguyen and Bhuyan (1977) estimated the export and import demand elasticities for Bangladesh, India, Pakistan and Sri Lanka. However, none of the countries had initiated trade liberalization reforms at the time of this study.

This study endeavours to examine Sri Lanka's aggregate export price, export income elasticities and the impact of the two main trade liberalization regimes. One of the major objectives of the trade liberalization policies is to scratch the depleting foreign exchange reserve problem of a country. However, the success of such policies unarguably depends on the

trade elasticities. Further, the importance of export sector performance is highlighted as Sri Lanka is currently moving towards the formation of economic unions with other South Asian countries and the trading partners out side the South Asian region.

Overview of the export structure

Sri Lanka has been heavily dependant on foreign trade since the colonial period. Export earnings generated by the major cash crops were supplemented for the import of consumer goods. However, the increased expenditure for imports of consumer goods than the earnings generated by exports hampered the terms of trade. Therefore, the balance of payment crisis was managed with the control of imports and the currency appreciation. Until the late 1970s, Sri Lanka's economy centred on the import substitution activities performed mainly by state owned firms.

Sri Lanka initiated the economic and trade reforms in 1977, due to the failure to achieve economic progress through inward-oriented policies encouraged by strong export-driven growth in East and South East Asian economies. Accordingly, Sri Lanka became the first South Asian country to adopt trade liberalization policies. The tariff played a significant role in regulating the international trade. With the aim of removing trade related policy distortions, further emphasis was placed on liberalization of the licensing controls over imports and abolishing all types of export duties towards the end of 1992.

The pattern of Sri Lanka's export performance and the real exchange rate clearly shows the impact of trade reforms on the economy. As shown by the Figure 1, there was an increase of exports with a positive rate of growth from 1974 to 1977. Heavy currency depreciation could be seen from 1976 to 1977, which has lead to a sudden increase of exports by 58 percent of growth in 1977/78. However, this growth was not sustainable and fell sharply in the next year to 4.5 percent indicating the country's inability to support the economy after heavy currency depreciation. An unsteady growth pattern of exports during the next few years also indicated that the export sector did not have enough incentives from the trade reforms. However, growth remained positive during 1991 to 2001. Export growth fell sharply in 2001, due to overall collapse in the world trade and gained a rapid recovery during the next three years.

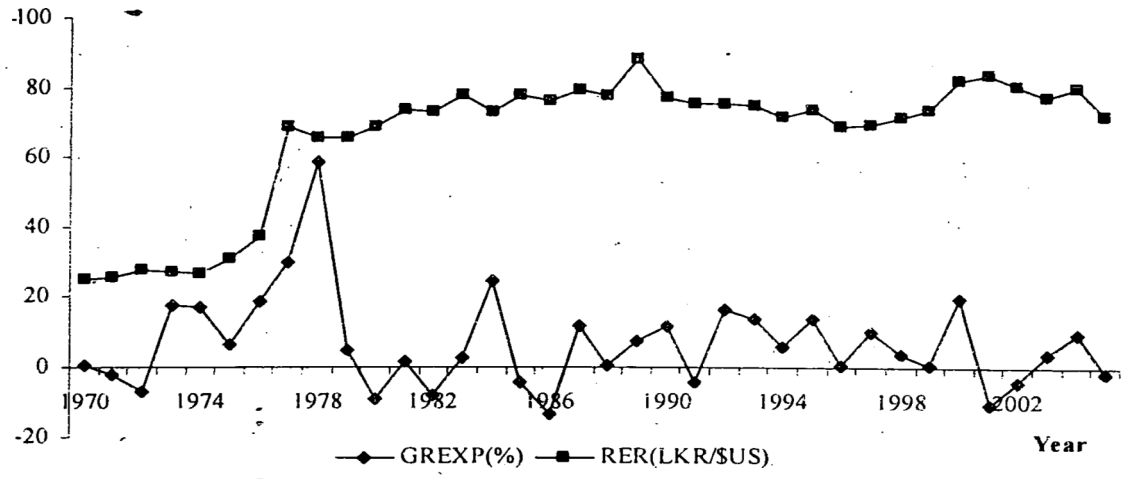

Figure 1. Growth of Real Exports (GREXP) and Real Exchange Rate (RER)[1] in Sri Lanka.
Source: IFS statistics

METHODOLOGY

Model specification

This study estimated the income and price elasticities associated with the export demand function for Sri Lanka in relation to the impact of trade liberalization policies during 1977 and 1992. The standard export demand functions, described by Pacheco-Lopez (2005), Sahinbeyoglu and Ulasan (1999), and Santos-Paulino and Thirlwall (2004) were used. A dummy variable was incorporated, in order to capture the effects of trade liberalization policies during the major period of reforms. Thus, the dummy variable was taken as a "zero" and "one" prior to the effective liberalization year and the post liberalization period respectively.

The augmented form of the standard export demand function with the logarithmic transformation was expressed as in equation (1).

$$\log rexp_t = \beta_0 + \beta_1 \log rer_t + \beta_2 \log rgdp_t + \beta_3 lib + e_t \qquad (1)$$

where, log $rexp_t$ was the real log value of exports of the country measured in US dollars. The real value of exports was obtained by deflating the nominal values by the consumer price index (CPI). The log rer_t was the log value of real exchange rate. *rer* was obtained by using the nominal exchange rate, foreign price P_f (United States CPI) and domestic price P_d. log $rgdp_t$ was the log value of the real gross domestic product of foreign country.

[1] Note: Real exchange rate of Sri Lanka is calculated using the United States Consumer Price Index (CPI) : $RER_{SL} = ER_{SL}(CPI_{USA} / CPI_{SL})$

The real value of Gross Domestic Product (GDP) was obtained by deflating nominal GDP of USA using the US GDP deflator (1990=100). The trade liberalization dummy variable was specified as *lib*. The coefficients to be estimated were β_0, β_1, β_2, β_3 and e_t was the disturbance/noise term. The export demand functions were estimated using cointegration and error correction methods developed by Engle and Granger (1987), which is more appropriate since most of the time series data have unit root problems.

Data

The main objective of this research was to examine the impact of trade liberalization of export demand of Sri Lanka. For this purpose annual time series data were collected from the International Financial Statistics (IFS, 2005) data base of the International Monetary Fund (IMF). Data ranging from 1950 to 2005 were considered for the analysis.

USA is considered as the country influencing foreign income and price levels for export demand[2] of Sri Lanka. Therefore, consumer price of USA was considered as foreign price level to estimate the real exchange rate and the USA income was used as a proxy to measure 'world income'. The USA GDP, GDP-deflator index and CPI were also obtained from IFS.

The analysis was carried out using trade liberalization dummy variable in two reform periods namely, 1977 and 1992. To illustrate, during the first reform, the dummy was assigned 'zero' from 1950-1976 and 'one' from 1977-2005. During the next reform, the dummy was assigned 'zero' from 1950-1991 and 'one' from 1992-2005.

Unit root test

Since the use of time series data was required for checking the unit roots i.e. stationarity, the Augmented Dickey Fuller (ADF) unit root test was performed to examine whether a series contained a unit root. Since the true data generating process of these variables were not known, ADF tests were conducted on the three model specifications; as a pure random walk, random walk with drift, and a random walk with drift and a trend. The appropriate lag length was decided using Schwartz Bayesian Criterion. ADF test results suggested that all of the variables contained a unit root in levels (non stationary), but were stationary in the first difference (Table 1).

[2] In year 2000 the proportion of export shares sent to USA from Sri Lanka was 44.2 percent. (Direction of Trade Statistics, IMF data, various issues).

Table 1. Augmented Dickey Fuller unit root test.

Level	*lnrexp*			*lnrgdp*			*lnrer*		
	ADF1	*ADF2*	*ADF3*	*ADF1*	*ADF2*	*ADF3*	*ADF1*	*ADF2*	*ADF3*
	-1.06	-0.87	-2.8	11.03*	1.25	-2.23	1.66	-1.03	-1.03
1st difference	Δ ln*rexp*			Δ ln*rgdp*			Δ ln*rer*		
	ADF1	ADF2	ADF3	ADF1	ADF2	ADF3	ADFi	ADF2	ADF3
	-7.49*	-7.63*	-7.55*	-3.27*	-7.20*	-7.17*	-6.23*	-6.51*	-6.51*

*denotes statistical significance at the 1% level. The critical values as reported in Engle and Yoo (1987), for 50 observations at 1%, 5% and 10% levels of significance: ADF1(τ statistics) -2.62, -1.95, and -1.61 : ADF2 (τ_μ statistics) -3.58, -2.93 and -2.60: ADF3 (τ_t statistics) -4.15, -3.50 and -3.18. The time period assessed is 1950-2005. All variables are in real values (2000=100) and in logarithm form.

Engle-Granger (EG) methodology

Engle and Granger (1987) suggested that a linear combination of nonstationary variables may produce a stationary series. As suggested by EG method, the two step procedure was adapted; firstly, non stationary variables integrated in the same order was estimated using standard regression techniques; secondly, the residuals from the best linear regression were tested for the unit root.

Initial diagnostic tests such as regression specification of this study revealed theoretically unexpected signs for price and income elasticity. From the economic theory, it is expected that the price elasticity of demand for exports is positive (β_1>0) as the depreciation of the home currency leads to higher monetary values for exports. The income elasticity of demand is also expected to be positive (β_2>0) as the increase of foreign income leads to increase the demand for export of normal goods.

Therefore, the following model was selected incorporating a trend (t) variable to the previous equation, which is written as;

$$\ln r\exp_t = \beta_o + \beta_1 \ln rer_t + \beta_2 \ln rgdp_t + \beta_4 lib + \alpha_2 t + e_t \qquad (2)$$

Error Correction Model (ECM)

Cointegration is only related to the long run relationship of the variables. Short run relationship of variables was estimated via an ECM. Once the cointegration relationship of the variables was confirmed, saved residuals $\{e_{t-1}\}$ were used to estimate the ECM as shown in equation (3). The coefficient of the error correction term (γ) in this model was referred to as the speed of adjustment parameter.

$$\Delta \ln r\exp_t = \alpha_1 + \beta_1 \Delta \ln rer_t + \beta_2 \Delta \ln rgdp_t + \gamma e_{t-1} + \varepsilon_t \qquad (3)$$

RESULTS AND DISCUSSION

As discussed earlier, the aim of this study was to estimate long-run and short run export elasticities for Sri Lanka. The results of the cointegration are summarised in Table 2. ADF unit root test results on residuals showed the existence of a cointegrated relationship. The results of the error correction model are summarized in Table 3.

Table 2. The co integrated relationship and ADF unit root test on residual series.

	Constant	*lnrer*	*lnrgdp*	*lib*	*t*	*R2*	*F-Stat*	*ADF on* e_t
1977	0.54	0.192	0.359	-0.010	-0.033	0.77	43.69*	-2.96+
	(0.09)	(1.50)	(0.63)	(-0.07)	(-1.80)**			
1992	-6.62	0.29	1.06	0.18	-0.06	0.79	48.52*	-3.06+
	(-1.11)	(3.24)*	(1.78)**	(2.09)*	(-2.94)*			

* 5%, ** 10%, significance in OLS estimates, *t* statistics are given in parenthesis +, statistical significance at the 1% according to the Dickey Fuller critical values. The critical values for τ statistics as reported in Engle and Yoo (1987) for 50 observations are -2.62, -1.95, and -1.61 at 1%, 5% and 10% levels of significance respectively.

Table 3. Estimates of the error correction model.

	Constant	*Δlnrer*	*Δlnrgdp*	e_{t-1}
1977	-0.058	0.308	1.080	-0.29
	(-2.53)*	(2.47)*	(1.88)**	(-3.14)*
1992	-0.05	0.184	0.942	0.23
	(-2.14)*	(1.42)	(1.58)	(2.34)*

*5%, ** 10%, level of significance

Estimates of the long run price and income elasticity during 1977 reforms showed expected signs, but were not statistically significant at 5 percent level. The low price elasticity of export demand suggests that Sri Lanka is basically exporting inelastic goods. However, price and income elasticity estimates during 1992 were both significant with an elastic income. This suggests that the 1 percent increase in the world income would increase Sri Lanka export demand by 1.06 percent. Although elasticity of price was found to be inelastic, the significant difference suggests the prevalence of price responsiveness to exports.

The coefficient of trade liberalization during 1977 had a negative sign but not statistically significant implying that trade liberalization was not a major determinant of export demand in Sri Lanka. Significant changes could be seen after 1992 as trade reforms had been able to increase the county's export demand by 18 percent each year at 5 percent level of significance. This suggests that country's export performance has come to a momentum after 15 years.

The estimated error correction model suggests that the short run income and price elasticity of export demand was higher in magnitude than the long run income and price elasticity during 1977 reforms. However, this unusual behaviour has changed during 1992 and error correction coefficient suggests that any deviation from the long run export demand is corrected at a speed of 23 percent annually to reach long run equilibrium.

CONCLUSIONS

The study estimated both short and long run income and price elasticities of the export demand functions of Sri Lanka. As it was found, Sri Lanka's export income and price elasticities seem to be basically inelastic in nature after 1977 reforms. It is commonly believed that mainly traditional exports such as agricultural produce are inelastic while exports of manufacturing goods are highly elastic. Since the USA income had been taken as the proxy variable for foreign income, these observations directly related with the changes in USA economy.

During 1992, Sri Lanka's export performance was significant with high price and income elasticity estimates. This was mainly due to the change in pattern of Sri Lanka's export structure, diversifying commodities into manufactured and other value added goods. Significant and high price elasticity value suggested that Sri Lanka's export demand can be improved by adopting good monetary policies. Even though, trade liberalization has not been a significant impact for Sri Lankan economy during 1977, the changes in export structure and escalation of export duties has lead the country to achieve higher export growth after 1992.

This study estimated only aggregate export demand elasticities of the economy. Further studies can be carried out to estimate disaggregated export demand elasticities for major sub sectors of the economy such as agriculture, manufacture and services, and for individual export commodities. Thus, disaggregated export demand elasticity estimates enable to specify policy intervention measures for the betterment of each sub sector and product category of the economy.

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