Sensitivity of Exports to Change in Relative Prices and Nominal Exchange Rate: Case of Manufacturing Exports of Sri Lanka

Received 27 January 2023
Revised 27 March 2023
Accepted 09 March 2023

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Abstract

In 1950, Orcutt argued that 'trade flows respond to changes in nominal exchange rate faster than to changes in relative prices'. Subsequently empirical studies have tested this hypothesis and have found mixed results. The experience of Sri Lanka, where it has been encountering a relentless fall is the share of its exports in the global trade during the past decade, provides an ample motivation to test this hypothesis to ascertain which policy instruments would stimulate its export performance faster. This study tests the Orcutt's conjecture on Sri Lanka export flows to its six major trading partners, using annual data for the period 1970 -2019. Since the data is mix of I(1) and I(0), Autoregressive Distributed Lag (ARDL) technique is employed to incorporate the dynamic adjustments of relative prices and the nominal exchange rate. The findings indicate that, in the short run, exports respond only to changes in nominal exchange rate, but does not respond to the changes in relative prices. In the long run however, exports respond to changes in both relative price and changes in nominal exchange rate. The impact of changes in exchange rate are relatively higher in both short-run and long-run. The findings of this analysis are consistent with the Orcutt's hypothesis and suggest that nominal exchange rate would be a more appropriate policy instrument to promote export performance of the country.

Keywords: Orcutt's hypothesis, Exchange rate, Relative prices, Export growth, Trade flows, Autoregressive Distributed Lags (ARDL) model.

SLJMS
Sri Lanka Journal of Management Studies
Vol. 4 – Issue II, 2022
pp, 119–– 134
ISSN (Online): 2792-1093
http://doi.org/10.4038/sljms.v4i2.100

Introduction

The level of performance in the export sector of a nation is not only determined by the level of economic activities and its degree of openness, but it can be influenced by trade policies and adjustments in macroeconomic policies as well. On the policy front, policy makers can promote exports by either devaluating domestic currency or by changing the relative price of tradable goods through tariff or export subsidies. When deciding as to which policy to be more effective, the degree of sensitivity of exports to changes in policies as well as the speed of such responses are relevant and should be considered. Therefore, not only the magnitude of the impact, but also the time lag of the response effect is to be considered in policy evaluation.

In 1950, Orcutt first examined, how trade flows respond differently to changes in exchange rate and relative price changes. According to Orcutt's hypothesis, trade flows respond to the changes in the exchange rate faster than to the changes in relative prices (Orcutt,1950). The objective of this paper is to test this hypothesis based on the behavior of manufacturing exports of Sri Lanka for the period of 1970-2019.

Sri Lanka is a small open economy aspiring to reach the status of a developed economy giving emphasis on export led growth strategies. Since 1977, Sri Lanka has been following trade liberalization efforts with revolutionary changes in the development strategy and macroeconomic policies, albeit with some variations in the degree of emphasis, towards making export sector vital for growth.

Export sector has been considered as the engine of economic growth in the post liberalization period. The export structure has changed dramatically over time with export-oriented policy reforms. Gradually, the manufactured goods have become the most vibrant component in the export structure. Sri Lanka was able to achieve a higher rate of economic growth, compared to other developing countries in the region, which was mainly supported by fast expansion of exports. In the first two decades of post liberalization period, the growth of export, particularly of the manufactured exports, was magnificent and an indication of the effectiveness of the policies introduced to promote exports.

However, the nation has failed to maintain that momentum of export growth on a sustainable basis, where the significance growth in the early post liberalization period become slowed down gradually. Since 2000, Sri Lanka's export performance was not at the level of satisfactory condition. A continuous drop in the share of Sri Lankan exports in the international market can be observed over the past decade, while Sri Lankan exports as a share of DGP has also been on the declining trend. The substandard performance of the export sector is partly responsible for the deteriorating trade deficit of the country.

Erosion of international competitiveness has been underlined as a crucial factor for this downfall in Sri Lankan exports. In policy debates, it was critically argued that Sri Lanka is losing the competitiveness in the global market due to massive appreciation of domestic currency over a long years, which had been driven by inappropriate and inconsistent macroeconomic policy measures (Athukorala & Jayasuriya, 2015). In addition, the blame is on trade policies as they have been biased against exports. The phenomena highlights the need of adopting more appropriate

policy measures to arrest the reversal export performance given the dramatic challenges taking place nationally and internationally.

The policy makers can influence export sector performance either by adjusting trade policies or by changing in the macroeconomic policies. What is important here is to identify the most effective policy approach that would help boost external sector performance, while enhancing the performance of the overall economic activities, through chain effects.

It is important to note the distinctive nature of effects that trade policies and exchange rate policies have on the economy. Trade policies effect on the domestic price of specific tradable products or services leading to change in relative prices of tradable and non-tradable goods. In contrast, changes in the nominal exchange rate affect the domestic prices of all goods and services, though at different degrees depending on the nature of their link to the exchange rate and alter the relative price between tradable and non-tradable goods (Perkins et al., 2013). The devaluation of domestic currency makes exports more profitable, as it enables exporters to earn more domestic currency from the same volume of exports. Further, the undervaluation of currency helps boost exports by improving the international competitiveness. However, which policy could affect the export performance faster and more effectively is a major concern to the policy makers.

The objective of this paper is to examine whether exchange rate policy or the trade policies (through relative price changes) affect the export performance faster and more effectively. With that objective, this paper tests the Orcutt's conjecture with respect to Sri Lanka exports using annual data for the period 1970-2019.

The paper is organized as follows: In this section (Section One), the background and the importance of the research topic is introduced highlighting the research question. Section Two consists of the literature survey. The model, data and methodology are given in Section Three. Section Four presents the analysis of the findings, followed by the conclusion in Section Five.

Literature Review

In 1950, Orcutt (1950) argued that the trade flows are responding in different manner to small and temporary price changes compared to large and permanent changes in nominal exchange rate. His argument has been examined by many subsequent empirical studies. Finding of such studies are available in the existing literature that test the Orcutt hypothesis, including Omisakin et al. (2010), Bahaman & Kara (2003), Wilson & Takacs (1979), Tegene (1989), Bahman (1986) and Junz & Romberg (1973). The findings of these empirical studies are mixed and inconclusive.

The study by Junz & Romberg (1973), has used panel data for thirteen developed counties to measure the partial correlations between trade flows, exchange rates and prices. They have found that trade flows respond to both exchange rate and relative prices in similar pattern. Wilson & Takacs (1979) estimated the standard import and export demand functions for six industrial countries (Canada, France, Germany, Japan, UK, and USA) using annual data from 1951-1971 by employing lag lengths of the exchange rate and the price levels. They concluded that the length of response lags on exchange rates was shorter than that of changes in prices, thereby confirming Orcutt's conjecture.

The study by Bahaman & Kara (2003) criticizes the findings of Wilson & Takacs (1979), as during the reference period of their study the exchange rates were not flexible as it was belonged to the Bretton-Woods years. Further, their study has not examined whether there is any long run relationship between in the variables (integration properties) in export and import demand equations. Therefore, the estimations may be spurious, in case of variables are not in the same order of integration. Accordingly, Bahaman & Kara (2003) have used co-integration and error-correction techniques in their study and have used quarterly data for nine different countries (Australia, Austria, Canada, Denmark, France, Germany, Italy, Japan and USA). The findings of the study have revealed different results for different countries; response was quick for the changes in exchange rate in some countries, while some countries' trade flows show fast response to the price changes. So, they concluded that the applicability of the hypothesis is country specific.

In addition to the above studies which have given emphasis on developed countries, Bahaman (1986) has placed his emphasis on developing countries (Brazil, Greece, India, Israel, Korea, South Africa and Thailand) and estimated import and export demand functions by using data for the period 1973-1980. According to his findings, in almost all the cases trade flows responded to exchange rate changes faster than changes in the price levels thereby supporting the Orcutt hypothesis.

In contrast, the findings of the study by Tegene (1989) based on least developed African countries (Ethiopia, Cote d Ivoire, Kenya, Malawi, Mauritius, Tunisia and Zambia) shows the speed of response is different for imports and exports. Imports respond to the exchange rate changes quickly than to the changes in price levels, but in contrast the response of exports was opposite thereby contradicting the Orutt hypothesis. These findings also could be spurious, as the study has not checked against co-integration properties of the variables included in both import and export demand functions.

In 2008, Bahaman & Kara, again has tested the Orcutt hypothesis, considering different set of countries (Colombia, Greece, Hong Kong, Hungary, Israel, Korea, Pakistan, the Philippines, Poland, Singapore, South Africa, and Turkey), since their previous study provides inconclusive outcomes. They have estimated separate import and export demand functions for each country using quarterly data from 1973-2002. However, as same as the findings in Bahman & Kara (2003), they have again found that there is no specific pattern and speed of response of trade flows to a change in relative prices and to a change in nominal exchange rate is country specific. Additionally, they have found that results could be sensitive to lag selection criterion, which is implied the importance of choosing the proper lag length based on the properties of data.

The recent studies, including Bahman & Hosny (2013), Rehman et al. (2018) and Khan & Ali (2020) also provides mixed evidence on the Orcutt hypothesis. However, these studies have sought to test the hypothesis by employing more disaggregated trade-flows, such as bilateral level, industry and commodity level, compared to the earlier studies, based on the data availability.

In 2013, Bahman & Hosny tested Orcutt's hypothesis using trade flows of between European Union and Egypt with respect to selected 59 industries that are account for 100% of their trade and have found 1/3rd of selected industries are supported for the Orcutt's hypothesis,

where imports and exports of theses industries are reacted to exchange rate changes faster than relative price changes.

Rehman et al. (2018) has tested the Orcutt's hypothesis both for selected developed and developing economies on imports and exports using time series data. The study has found that in most of the cases in developing and developed countries, the exchange rate has no significant short-run effect compared to relative prices on both exports and imports. Based on the findings, the study is inconclusive about the effectiveness of exchange rate and relative prices of exports and imports flows and suggested to improve the export competitiveness by taking certain other measures.

Khan & Ali (2020) have tested Orcutt's hypothesis for Pakistan considering its eight major trading partners using bound testing approach and employing annual data from 1974 to 2018. The study has used disaggregated trade data at a bilateral level and results have confirmed the evidence of Orcutt hypothesis in the case of Pakistan's imports from five countries (China, India, Japan, Saudi Arabia, and the UAE) and in case of export only to two countries (UK and China).

Despite plethora of research devoted to study on Sri Lankan export sector, the relative responsiveness of the trade flows in Sri Lanka to changes in exchange rate and changes in relative prices has not been examined, particularly giving emphasis on the speed of the responses to changes of these variables. Given mixed and inconclusive results in the international empirical evidences on Orcutt's conjecture, it is worthy to determine how it works on Sri Lanka. Further, such determinants will be facilitated in formulating and implementing more accurate export promoting policies. In the current country context, where economic crisis situation calls for rapid policy responses to support the economic recovery process, where the export sector has given the priority, such accurate policy decisions are ever timely importance. In view of the above, this study attempts to fill the empirical gap in local literature by testing the Orcutt's hypothesis with respect to Sri Lanka manufacturing exports.

Model, Data and Estimation Method

The Model

In order to investigate the main hypothesis of the paper, the study employs the following log linear export demand function following Bahaman (1986).

$$\text{Ln } EXP_t = \beta_0 + \beta_1 \text{ Ln } YW_t + \beta_2 (Pw_t/Pd_t) + \beta_3 \text{ Ln } NER_t + \beta_4 \, IND_t + u_t \qquad (1)$$

EXP = Total Manufacturing Exports
YW = World Income
Pw/Pd = Relative Price
NER = Nominal Exchange Rate
IND = Dummy variable for trade agreement with India (1970-2000 =0)
u = Error term

t = Time

In Equation (1) above, dependent variable is the total manufacturing exports in real term (EXP). It assumes that EXP depends positively on world income (YW - trade weighted real GDP in USD), hence estimate of B1 to be positive. Because it assumes that when income level of importing countries increases, Sri Lanka can export more. However, if the importing countries highly focus on export substitution policies and as a result of their income increase, it will not positively effect on Sri Lanka exports and could lead to yield a negative estimate of B1.

(Pw/Pd) indicates the relative price of domestic exports to the world price. When increase the domestic export price compared to the world's price, it will discourage exports. Therefore, an estimate of B2 is expected to be negative. The nominal exchange rate (NER) is defined as the number of Sri Lankan Rupees per one unit of foreign currency, a decrease in NER or an appreciation of domestic currency is expected to reduce the export volume, therefore an estimate of B3 is expected to be positive. The dummy variable IND is included to capture the impact of trade agreement with India undertaken since 2000 with the expectation of increasing trade opportunities with India. It is expected that an estimate of B4 is positive. Thus, the expected signs of coefficients in the model are as follows,

$$\beta 1 > 0 \text{ or } <0,\ \beta 2 < 0,\ \beta 3 > 0,\ \beta 4 > 0$$

The null hypothesis is, H0: $\beta 1 = \beta 2 = \beta 3 = \beta 4 = 0$, against the alternative hypothesis of H1: $\beta 1 \neq \beta 2 \neq \beta 3 \neq \beta 4 \neq 0$.

Data and Sources

The dependent variable of the model is total manufacturing exports. Data for manufacturing exports (EXP) obtained from the annual reports of Central Bank of Sri Lanka. For constructing the YW series (World Income), Relative Prices (Pw/Pd) and Nominal Exchange Rate (NER), trade weighted averages were constructed based on the exports share of six major export destinations i.e. USA, UK, India, Germany, Italy and France. Data for YW (World Income: trade weighted real GDP of trading partners) obtained from the world development indicators (WDI) of the World Bank site. In order to measure the relative prices, trade weighted Producer Price Index (as a proxy for the world price) and GDP deflator (as a proxy for domestic price index) is used. Data for Producer Price Index of trading partners obtained from UNCTAD (United Nations Conference on Trade and Development) Site and nominal and real GDP data (to calculate domestic GDP Deflator) obtained from the WDI. Nominal exchange rate (NER) data obtained from UNCTAD (United Nations Conference on Trade and Development) Site. The graphs of data series on lag levels are given in Annexure I and summary statistics are given in Annexure II.

Table 01. Data and Sources

Variable	Data	Source
EXP	Manufacturing Exports	Central Bank of Sri Lanka publications

YW	World Income: Trade weighted real GDP of trading partners	World Development Indicator -World Bank
Pw/Pd	Relative Price	UNCTAD Statistics, United Nations Conference on Trade and Development World Development Indicator -World Bank
NER	Nominal Exchange Rates	UNCTAD Statistics, United Nations Conference on Trade and Development
IND	Dummy for trade agreement with India	Based on Literature Survey

Source: Author's compilation

Estimation Method

Time series data are used in this study and the estimates were done using E-views 9.5 software. The properties of data were examined as the first step using unit root test, to check whether variables are stationary or non-stationary and to identify the order of integration, because non-stationary data could produce spurious results. Augmented Dickey Fuller (ADF) test were undertaken and log level variables were tested at first for unit root. If the series is identified as non-stationary, then the first difference of the series is tested for unit root. The series become stationary at level, are called I(0) and if the series becomes stationary after take the first difference, they are called I (1) series. The ADF test results are reported in the Table 2.

Table 02. Results of ADF Test

Variable	**Level**		**First difference**		Order of Integration
	ADF Test Statistic	Critical Value at 5% Level	ADF Test Statistic	Critical Value at 5% Level	
Ln EXP	-3.359	-3.52	-4.106*	-3.52	I(1)
Ln YW	-2.561	-3.52	-4.856*	-3.52	I(1)
Ln (Pw/Pd)	-4.013*	-3.52	-4.846*	-3.52	I(0)
Ln NER	-1.355	-3.52	-6.932*	-3.52	I(1)

Note : H0 : Series has a unit root, H0 is rejected at the 5per cent level

Source: Author's estimation

According to ADF test results, one of the independent variable; (Pw/Pd), is stationary at level (integrated of order zero: I(0)) and all other variables are become stationary at first difference (integrated of order one: I(1)). Since the unit root test results confirmed that the variables are a mix of I(0) and I(1), the study uses the Autoregressive Distributed Lags (ARDL) methodology developed by Pesaran & Shin (1999) and Pesaran (2001).

The conventional cointegration techniques are required all regressors to be integrated in the same order. But the ARDL method can be used with mix of (1) and I(0) variables. Further, ARDL method is more favorable to work with small and finite samples, as it could deliver statistically significant results, while other techniques are required large sample sizes. ARDL technique provides opportunity for variables to have different time lags in the model. Accordingly, ARDL methodology is perfectly suit with the objective of this study, as it needs to test the dynamic adjustments of the variables. Further, this technique takes care of the problems of omitted variables, serial correlation and also endogeneity problem as it provides unbiased estimates of the long-run model. According to ARDL technique, one single reduced form equation is used to estimate both long run and short run relationships (Harris & Sollis,2003).

The ARDL specification for the model (1) above as follow,

$$\Delta \text{ Ln EXP}_t = \alpha + \Sigma \psi_k \Delta \text{ Ln YW}_{t-k} + \Sigma \gamma_k \Delta \text{ Ln (Pw/Pd)}_{t-k} + \Sigma \theta_k \Delta \text{ Ln NER}_{t-k} + \Sigma \lambda_k \Delta \text{ EXP}_{t-k} + \beta_1 \text{ Ln YW}_{t-1} + \beta_2 \Delta \text{ Ln (Pw/Pd)}_{t-1} + \beta_3 \text{ Ln NER}_{t-1} + \beta_4 \text{ Ln EXP}_{t-1} + \beta_5 \text{ IND}_t + \epsilon_t \quad (2)$$

Where Δ indicates that variables are in the lagged-differenced form. Coefficients of lagged-differenced variables (ψk, γk, θk, and λk) in the right-hand side of the equation stand for the short term dynamics. Coefficients of lagged level variables ($\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, and $\beta 5$) show long term dynamics. ϵ t is the random disturbance term.

In this model, linear combination of lagged level of variables are included, instead of including the lagged error term from equation (1) in equation (2) to capture the long run relationship. The decision to include these variables or to exclude them depends on the standard F test statistic which is compared with the critical values proposed by Pesaran (2001). Accordingly, upper bound critical value (UCB) is provided to use in the case of all variables are I(1), and lower bound critical value (LCB) is provided to use in case of all variables are (I(0)). When the F statistic of the joint significant test which performs with lagged level variables, is greater than the upper bound critical value, it determines that variables are co-integrated, where there is a long run relationship in the model.

After estimating the model, residual was tested for unit root to examine whether residual series is stationary at level, which further confirms the existence of long run equilibrium among the variables. In addition, the most common and standard residual diagnostics tests were performed to validate the model; Serial Correlation LM to check the presence of serial correlation, and Breusch-Pagan-Godfrey test to check Heteroskedasticity of the model. Further, the stability of the system was tested by the CUSUM test.

Findings

The prime objective of the study is to examine how exports respond to the changes in relative price and changes in nominal exchange rate, while emphasis more on the impact of long run dynamics, as long run impacts are more favorable in analyzing the matter.

The F test statistic reported by the Bound test is 7.09, which exceeds the UCB critical value. Therefore, the null hypothesis is rejected, where there is a long-run relationship in the model. Bound test results are given in Table 3.

Table 03. Test statistics*: (at 5% significance level)

LCB	UCB
-2.561	-3.52

Source: Pesaran (2001), Table CI(iii) Unrestricted intercept and no trend
F test static: 7.09: P value: 0.0001***

The model was estimated for Total Manufacturing Exports (LN EXP), incorporating the other variables, as per the ARDL model specification given in equation 2 above. The summery of the model estimation is given in Table 4.

Table 04. Results of ARDL estimation

Cointegrating Form	
Variable	**Coefficient**
D(LN EXP (-1))	0.507*** *(5.530)*
D(LN YW)	5.507*** *(5.126)*
D(LN YW (-1))	-1.759 *(-1.544)*
D(LN NER)	0.581*** *(3.741)*
D(LN NER (-1))	-0.016 *(-0.105)*
D(LN (Pw/Pd))	0.678 *(1.486)*
D(LN (Pw/Pd (-1)))	0.453 *(1.028)*
D(IND)	0.087 *(0.712)*

C	-17.338*** *(-6.186)*
Count Eq (-1)	-0.2557*** *(-6.140)*
Cointeq = LN_EXPORTS - (4.3345*LN_WD + 1.6260* LN_NER -0.0243*LN_RP -0.4013*IND)	
Long Run Coefficients	
LN YW	4.334 *(1.349)*
LN NER	1.626** *(2.613)*
LN (Pw/Pd)	-0.242*** *(-3.723)*
IND	-0.401 *(-1.112)*

Level of statistical significance: *=10%, **=5%, ***=1%

The major focus of the study is on two variables in the model, nominal exchange rate (LN NER) and the relative prices (LN (Pw/Pd)) to test the Orcutt's hypothesis.

According to the estimation results, in the short-run the nominal exchange rate is significant at 1 per cent level, while the relative price is not statistically significant. However, in the long-run, relative prices become highly significant. It appears that Orcutt's hypothesis is supported by the findings, where exports are responding to the changes in nominal exchange rate in the short-run but not responding to the changes in price levels, while in the long-run exports respond to the changes in price level too.

The coefficient associated with the nominal exchange rate suggests that 1 percent devaluation could stimulate exports by on average 0.58 per cent in the short-run. In the long-run also the impact of nominal exchange rate on exports is higher than the impact of changes in price levels. Accordingly, a depreciation of nominal exchange rate by 1 per cent, could lead to increase in exports by about 1.63 per cent, while 1 percent decrease in relative export prices could lead to increase exports by about 0.24 per cent.

The coefficient of error correction term (Count Eq (-1)) is significant and with negative sign and shows the speed of adjustment towards the long-run equilibrium. Accordingly, whole system will get back to the long-run equilibrium at the speed 26 per cent.

In addition to the key variables used in the model, world income is significant only in the short-run; if real income of trading partners increases by 1 per cent, Sri Lankan exports to these countries could increase by about 5.5 percent. The dummy variable, IND, is not statistically

significant either in short-run or in the long-run, which implies that there is no impact of trade agreement with India since 2000 to increase Sri Lanka's export performance.

After estimating the model, residual diagnostic tests were performed, and the results are given in Table 5.

Table 05. Residual Diagnostic Tests

Test Statistic	F value*	Result
Serial Correlation- LM test	2.118653 (0.1391)	No Serial Correlation
Heteroskedasticity Test: Breusch-Pagan-Godfrey	1.378035 (0.2300)	No Heteroscedasticity

Note: Values in the parenthesis are the P-values

The serial correlation LM test confirmed that there is no serial correlation and Breusch-Pagan-Godfrey test for heteroskedasticity shows the system is free of heteroskedasticity.

For checking the stability and the accuracy of the estimated model, CUSUM test were used. Figure 1 illustrates the plots of the CUSUM statistics for the model, that confirms the estimated model satisfies the stability condition as there is no root lying outside and CUSUM statistic falls inside the critical bands at 5% confidence interval.

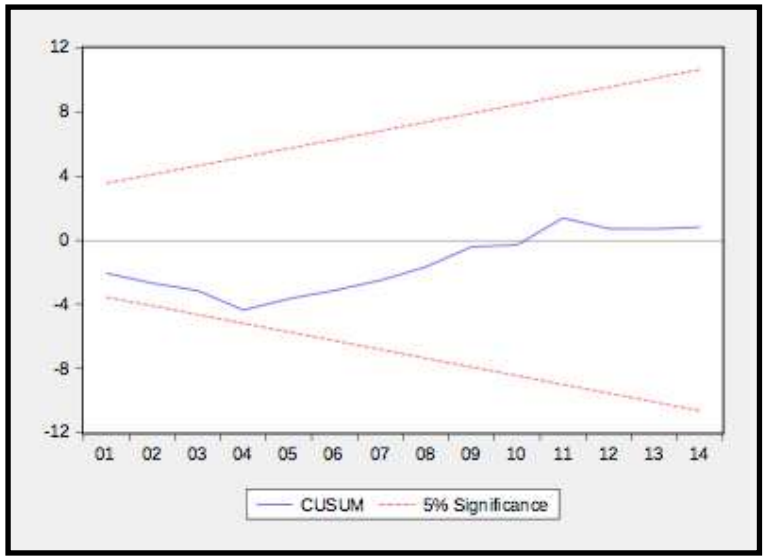

Figure 01. CUSUM Test Result

Conclusion

The study analyses the relative responsiveness of manufacturing exports of Sri Lanka to changes in relative prices and nominal exchange rate, by using annual time series data from 1970 to 2019. The study employed the ARDL model to estimate the export demand equation. The long-

run and short-run coefficients in the estimated model, confirmed the Orcutt's hypothesis. Export demand indicated no response to the changes in price levels in the short run and even in the long-run, it indicated a marginal response to price changes. Accordingly, findings suggests that devaluation of nominal exchange rate or/and allowing it to depreciate in line with the movement of other macroeconomic variables, particularly the inflation rate would help stimulate export performance in Sri Lanka than influencing the relative prices by tariff or subsidies in both short-run and in the long-run. The findings are consistent with arguments of many analysts and suggests some policy recommendations. Two common policy options discussed and recommended within the literature to correct trade flows and promote export are devaluation of the exchange rate or decrease in relative prices.

The findings of the study, which indicated with statistical significance that manufacturing exports of Sri Lanka are more responsive to changes in exchange rate than in relative prices, emphasizes the need for careful attention to the effect of exchange rate volatility on exports when formulating both fiscal and monetary policies to maintain realistic exchange rate. Under the current environment of twin deficits, nominal depreciation would not be the optimal solution. It should be complemented with maintaining price stability through an independent monetary policy.

Further, it is vital to encourage the export promotion strategies combined with policies to enhance research and development and transfer of technology enabling innovations and increasing productivity to improve the trade balance and long term sustainable growth in the overall export sector.

Considering the significant downfall of manufacturing exports in the recent past, whilst understanding its high potential to play a decisive role in the recovery process of the economy, the main focus of this study was on aggregate manufacturing exports and not on the overall trade flows of Sri Lanka. Lack of data on prices at bilateral level was one of the key limitations for testing the Orcutt's hypothesis with disaggregated export data at the bilateral level to address any aggregation biasness in the study.

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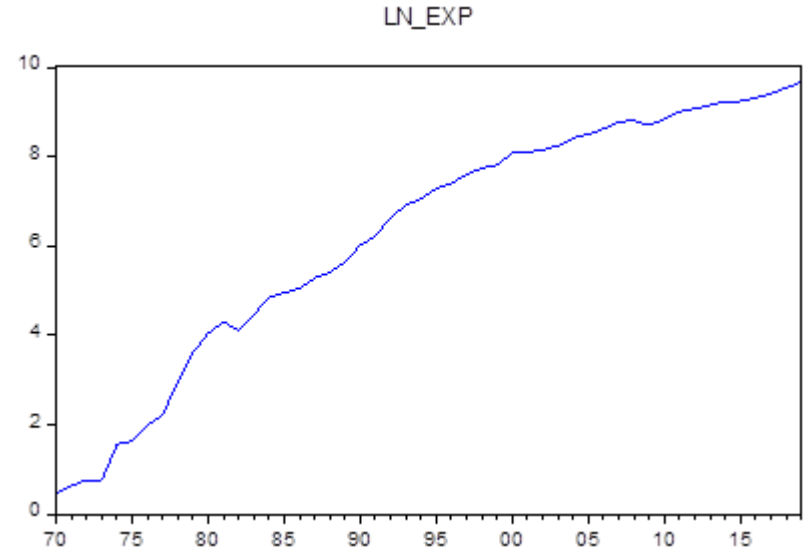
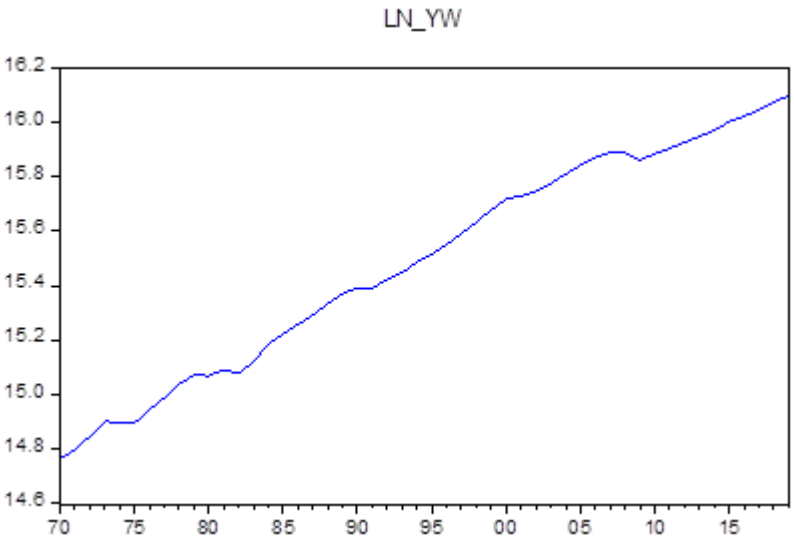
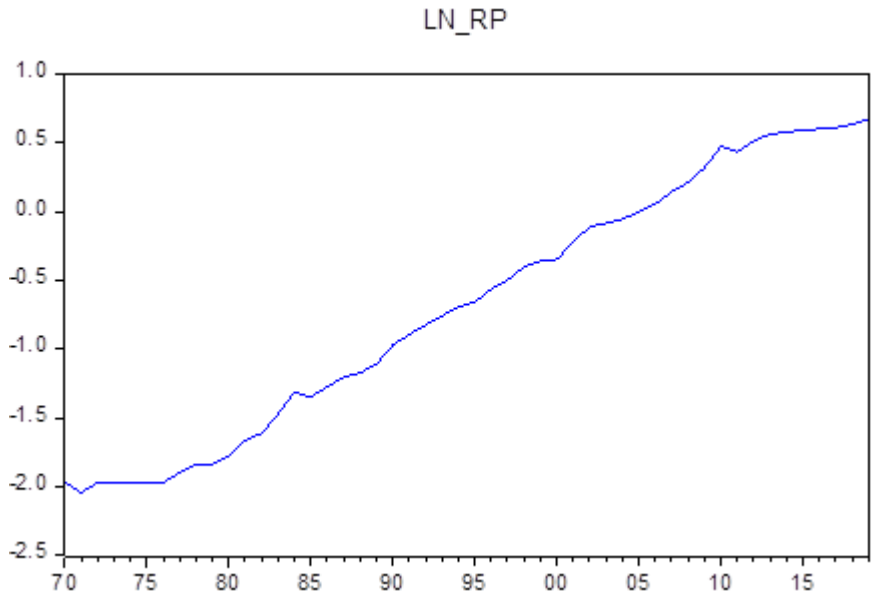
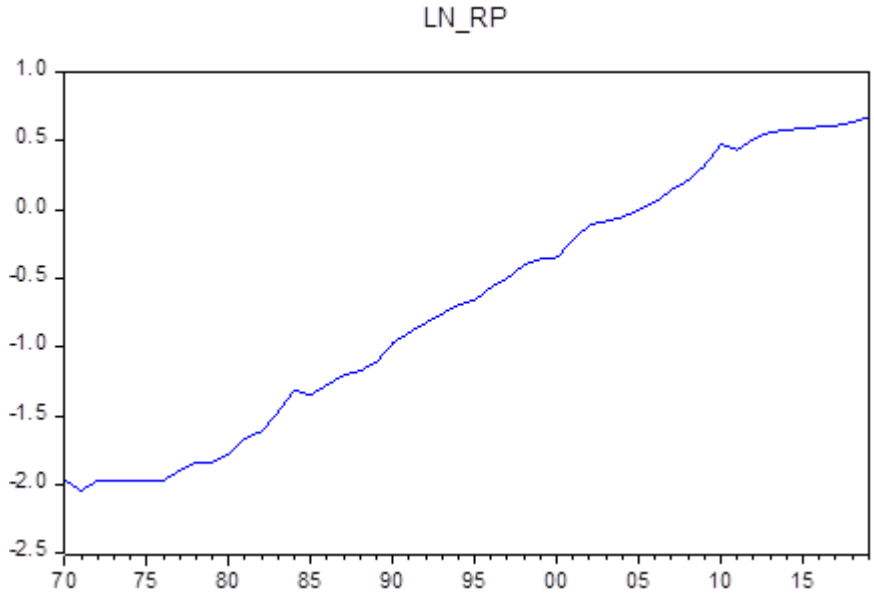
Annexures

Annexure 1. Logged Level Time Series Plots of the Variables from 1970-2019






LN_RP
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
70
75
80
85
90
95
00
05
10
15


LN_RP
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
70
75
80
85
90
95
00
05
10
15

Annexure 2. Descriptive Statistics

	LN EXP	LN YW	LN (PW/PD)	LN NER
Mean	6.883	15.423	-0.830	4.031
Median	7.468	15.423	-0.828	4.214
Maximum	8.650	15.972	0.581	4.993
Minimum	2.408	14.764	-2.023	2.654
Std. Dev	1.645	0.378	0.863	0.731
Observations	50	50	50	50