THE J CURVE EXPOSURE: ANALYSIS OF THE EFFECTIVE EXCHANGE RATES (EVIDENCE FROM SRI LANKA :1977-2011)

H.M.A.T.Koswatta

Department of Social Studies, The Open University of Sri Lanka

INTRODUCTION

This study is launched to investigate the J curve phenomenon using the effective exchange rate behavior on trade balance in Sri Lanka regarding its 10 major trading partners. These partner countries are selected by calculating the trade share for 60 countries. The top 10 trading partners are: USA, India, UK, Singapore, Japan, Germany, Hong Kong, Iran, China and Saudi Arabia. For these countries the Nominal Effective Exchange rate (NEER) and Real Effective exchange rates (REER) were constructed.

Literature: It has been found that trade in goods tends to be inelastic in the short term, as it takes time to change consumption patterns and trade contracts (Bahmani-Oskoee and Ratha,2004). Thus, in the short run even the Marshall–Lerner condition is not satisfied, and devaluation is likely to worsen the trade balance. But in the long run, consumers will respond to the new prices, and it will improve the trade balance. This is called the J curve effect. In the Sri Lankan context.Perera (2009) has found that there was no specific pattern for the trade balance between Sri Lanka and its trading partners in response to the change in real exchange rate, and none of the cases supported the J-curve.

Objectives: The objective of this study it is to investigate the impact of effective exchange rate changes on trade balance in Sri Lanka using the J curve phenomenon.
As the specific objectives the study strives to analyze the time series properties of the variables used in this study, to understand the behavior of these variables in Sri Lanka, to analyze the short run and long run effects of effective exchange rate changes on the trade balance, to investigate the existence of the Marshal Learner condition and to suggest some policy implications.

Hypotheses:

Impact of exchange rate changes on trade balance.

H_0: Effective Exchange Rate changes do not affect the Trade balance.

H_1: Effective Exchange Rate depreciation improves the trade balance.

Existence of J curve ideal in Sri Lanka.

H_0: Depreciation will not improve the trade balance even though the Marshal Lerner condition holds.
H_1: Depreciation will improve the trade balance if the sum of the price elasticity of domestic and foreign demand for imports is larger than unity.

METHODOLOGY

Exchange rate and the trade balance became substantial factors with trade liberalization in 1977. Therefore the chosen study period is 1977-2011, providing 34 annual observations are employed.

Data is extracted from the Central Bank (CBSL) Annual Reports, IMF Publications and *Econstat* data of the World Bank. All the data are in US Dollar Billions.
The trade share has been calculated at the first stage using the following formula.

$$TS = \frac{X_i + M_i}{X + M} \qquad (2.1.)$$

Where TS: Trade Share, i: Ten partner countries
The total exports and imports to each country are divided by total domestic exports and imports. Using equation (2.1) the 10 major trading partners are selected.
Real exchange rates are calculated as nominal exchange rate adjusted for the different rates of inflation.

$$RER = ER\left[\frac{CPI_{USA}}{CPI_{SL}}\right] \qquad (2.2)$$

The NEER is the weighted average of major bilateral nominal exchange rates. The weights are usually based on the trade shares, reflecting the relative importance of each of the major currencies and the Consumer Price Index (CPI). NEER Index is usually computed to reflect the changes in the foreign currency value of the domestic currency against a basket of currencies, which are important to the economy.

$$\text{NEER} = \prod_{j=1}^{m} r_{1_j}^{W_j} \qquad (2.3)$$

Where, r is the Exchange Rate of major trading partners and w will be the trade share of each country. The average increase in prices (inflation) is measured by a price index. The REER is said to measure the real exchange rate, taking into account variations of exchange rates and inflation differentials of major trading partner countries.
As the inflation rate in each country is assumed to broadly indicate the trends in domestic costs of production, the REER is expected to reflect foreign competitiveness of domestic products, given the rise in domestic prices.

$$REER = \left[ER \times \frac{CPI_{I}}{CPI_{SL}}\right] \qquad (2.4)$$

Where, CPI_{SL} is the domestic CPI, CPI_{i} is the foreign CPI and r is the exchange rate.

In the calculation of these variables, Colombo Consumer Price Index, Consumer Price Indices of major 10 trading partners, Exchange rates of those trading partners, GDP of those partners are used. To understand the behavior of the variables graphical methods and summary statistics are used. The Unit Root Test is employed to investigate the time series properties of the variables. To test for stationary of a series we have used Augmented Dickey Fuller (ADF) test and the Phillip Perron (PP) test.

Then the Engel Granger co integration test is employed to understand the long run relationship. For the short run co integrating relationship, the Error Correction Model is used. The Granger causality is used to examine the short run relations among the variables employed in the balance of trade regression equation. Impulse Response Function is used to measure the trade balance behavior due to the external shocks. And this test is adopted to identify the trade balance behavior due to the external shocks to Real Effective Exchange Rate. This study attempts to develop a similar model applied by Aziz N. (2008) for Bangladesh, in which the trade balance is a function of real exchange rate and the domestic and foreign real income. A log-linear specification of the model can be stated as follows:

$$TB = f(REER,,FI, DI, PX,PM,TOT)$$

$$lnTB = \beta_0 + \beta_1 lnREER + \beta_2 lnRDI + \beta_3 lnRFI + \beta_3 lnTOT \quad (2.5)$$

Here, lnTB, indicates logarithm of balance of trade (lnX-lnM), exports and imports. lnRER, InRDI, In*RFI and lnTOT*are logarithm of realdomestic income, real foreign income and real terms of trade respectively.

Export Function;

$$\ln X = \beta_0 + \beta_1 lnREER + \beta_2 lnRFI + \beta_3 lnPx \quad (2.6)$$

Where RFI is Real Foreign Income and Px is Export price index.

Import Function;

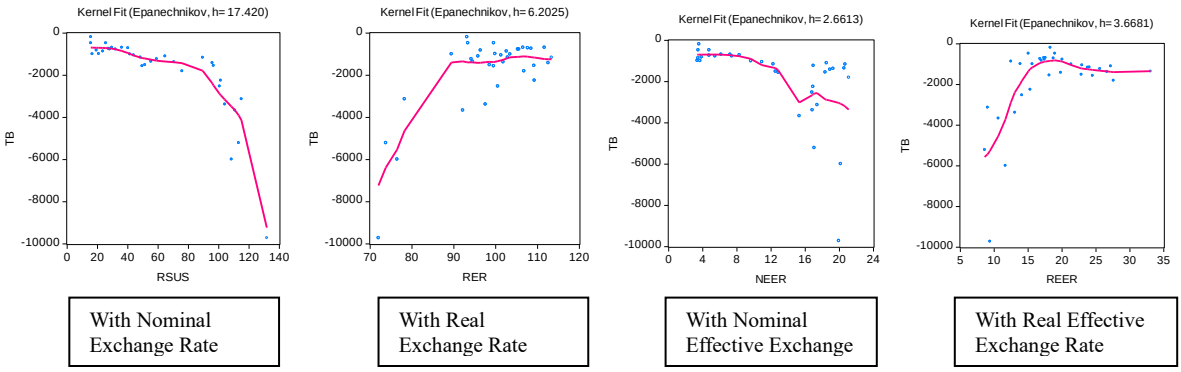
$$\ln M = \beta_0 + \beta_1 lnREER + \beta_2 lnRDI + \beta_3 lnPm \quad (2.7)$$

Where RDI is Real Domestic Income and Pm is Import price index.

RESULTS AND DISCUSSION

The impact of exchange rate policy related to depreciation of the Sri Lankan Rupee on the Trade Balance in the long run and short run has been examined using the real effective exchange rate and the nominal effective exchange rate, employing the data for Sri Lanka and its 10 major trading partners.

Engle Granger test attested that the Real Effective Exchange rate and Nominal Effective Exchange Rate do not influence the trade balance in the long run. Error Correction Mechanism perceived that the absence of short run relationship between REER and NEER on trade balance. Granger Causality test confirms that the exchange Rate does not cause the Trade Balance effectively. Marshal- Learner Condition does not exist in Sri Lanka. No evidence was found for the existence of J curve ideal and it is not applicable to any of the exchange rates.



With Nominal Exchange Rate | With Real Exchange Rate | With Nominal Effective Exchange | With Real Effective Exchange Rate

Finally it can be asserted that neither the Real Effective Exchange Rate nor the Nominal Effective Exchange Rate can generate a significant impact on the trade balance in Sri Lanka.

CONCLUSIONS/RECOMMENDATIONS

According to the above information, exchange rate policy is not effective in the Sri Lankan case. In order to improve the trade balance, Sri Lanka has to follow some other methods. Import tax policies can be imposed to reduce imports and to increase the government revenue. Since an import elasticity of 0.876 suggests that imports are facing an inelastic demand curve. Imposing taxes on these items will generate a higher tax income for the government. The domestic income co-efficient of the Import function is 0.307 suggesting that import substitution policies should be adopted.

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