International Trade Driven Growth Patterns in India, Pakistan, and Sri Lanka (1985 - 2015) : An Empirical Study

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Abstract

The purpose of this study was to conduct a comparative analysis of the Marshall - Lerner condition in case of India, Pakistan, and Sri Lanka for the time period from 1985 - 2015. Also, the paper attempted to show an empirical verification of the Marshall - Lerner condition. As the recession is prominent in the developed and the developing countries, therefore, this condition can provide respite in the form of a path to be followed to arrest recession. In order to analyze this condition, five variables were taken in this study namely; exports, imports, GNI, exchange rate, and world income. The annual data were collected from the World Bank database. All these variables were tested for stationarity and then for cointegration via SAS and finally, OLS technique was applied in order to find the import and export elasticity. The condition was tested separately for India, Pakistan, and Sri Lanka and then the comparisons were drawn. The results showed that this condition was satisfied in all three countries, but there were still certain important differences in the scenarios in the countries which led to the justification of the Marshall-Lerner condition. All these findings were supported with empirical analysis using available data. This study will be helpful to determine the trends in trade, and future research can be done to suggest the various changes which will help our country to grow its international trade.

Key words : **balance of payment, Marshall-Lerner condition, depreciation, export elasticity, import elasticity**

JEL Classification : F14, F41, F43

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In today's world, the problem of depression and recession is faced by not only the developing countries, but also by the developed countries. As a result of which there occurs deficit in the balance of payment. If a country's currency depreciates (under a floating regime) or is devalued (under a fixed system), this should lead to an improvement in the economy's current account position if the Marshall-Lerner condition is satisfied. A depreciation/devaluation will lead to a fall in the prices of exports and a rise in the prices of imports. Theory would suggest that demand for exports will rise and the demand for imports would fall ; hence, the improvement in the current account. Whether this improvement in the current account happens depends upon the price elasticity of demand for exports and imports. Also, there is a time lag involved between when the depreciation takes place and when the improvement starts in BOP. This pattern of BOT is depicted in the form of A J-curve. Marshall- Learner gave the most useful insight on how can the balance of payment be improved in such a situation (Davidson, 2009).

$$\varepsilon_x^{\,d} + \varepsilon_m^{\,d} > 1$$

where,

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ε_x^d is price elasticity of demand for exports,
ε_m^d is price elasticity of demand for imports.

This condition says that if the sum of price elasticity of demand (ε_x^d) for exports and price elasticity of demand for imports (ε_m^d)is greater than 1, only then the balance of trade will improve. This condition tells us whether the foreign exchange market is stable or unstable. If this equation is satisfied, then the foreign exchange is stable ; if this sum is less than 1, then the market is unstable ; and if it is equal to 1, then the change in exchange rate will leave the balance of payments unchanged.

However, the overall effect of the devaluation or the depreciation has an effect on the BOP of a country in three ways :

(i) The imports become costlier and so their volume reduces.

(ii) The exports are encouraged as they become cheaper for the rest of the world.

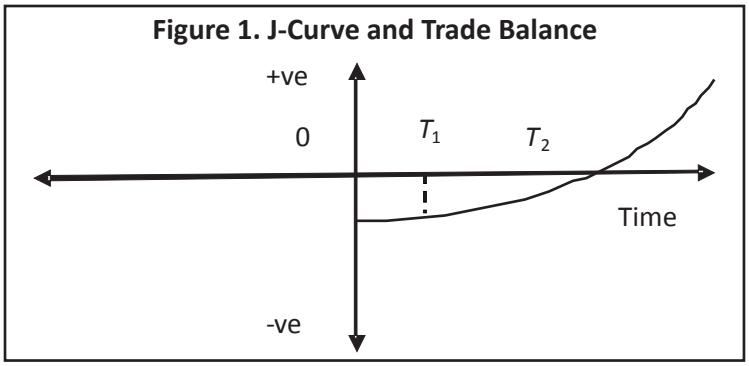
(iii) Lesser foreign currency is earned by a given quantity of exports.

Therefore, the ultimate effect depends upon how the imports and exports of a country respond to depreciation, which, in turn, depends upon the import and export demand elasticity. So, any combination of export and import elasticities that satisfies the Marshall-Lerner condition will cause the first two effects described above to outweigh the third, leading to an improved trade balance. However, one thing to take into consideration is that if the supply elasticities are low, then the Marshall-Lerner Condition will only be the sufficient condition and not the necessary condition.

J-curve is an important theory related with the Marshall - Lerner Condition. This says that immediately after the devaluation of the currency, the BOP may worsen because domestic currency prices of imports rise faster than the fall in export prices. Therefore, the quantity does not change immediately. So, initially, the BOP deficit may rise and then after some time, it starts increasing. Thus, this takes shape of the J-curve.

The liaison of exchange rate and trade balance is an imperative basis for the foreign policy of any country. According to the classical economic theory, the affiliation of exchange rate and trade balance can, to a great extent, be explained by the Marshall-Lerner condition and J-curve. Majority of the studies assessing the impact of currency depreciation on the external account of a country have focused on the well known Marshall-Lerner condition, which is a long run effect and the J-curve shows the balance of trade pattern following the devaluation.

Figure 1. J-Curve and Trade Balance



Upto T_1, the BOP worsens,
After T_1, BOP starts improving,

At T_2, BOP deficits become zero,
After T_2, BOP starts improving.

So, as visible in the Figure 1, when the real depreciation of the currency takes place, the BOT will worsen for a short- period but eventually, the BOT will improve and supposedly should never reach back to the pre-depreciation level. However, due to paucity of accurate data, in order to analyze the trade balance, Marshall - Lerner Condition and the import & export elasticities are used.

Hence, the major objectives of this research study are as follows:

(i) To compare the exports and imports patterns of India, Pakistan, and Sri Lanka with respect to their policies and economic scenarios.

(ii) To scrutinize India, Pakistan, and Sri Lanka's international trade using the Marshal-Lerner condition model.

(iii) To focus on the strengths and bottlenecks faced by India, Pakistan, and Sri Lanka with respect to the international trade sector.

Literature Review

An in depth literature review has been done, and it was observed that very few studies have been conducted to estimate the Marshall - Lerner condition in these countries. However, many economists all over the world have tried to scrutinize these two concepts. The countries where the J-curve pattern was clearly depicted were Italy (1992-1993), Mexico (1994 - 1995), Korea (1997-1998), and Poland (2009). European ERM crisis in 1992 actually helped Italy's economy to improve the BOP after 1992 second quarter as its currency devalued. Moreover, in the case of Mexico in 1995, through a combination of devaluation and expenditure reducing policies, the large trade deficits were quickly converted into large trade surpluses.

The empirical assessment of these conditions encompasses a wealthy heritage, and numerous studies attempted to find the nature of the relationship between exchange rate volatility and trade. The studies conducted in the 18th and 19th centuries mainly used the least square methods to guesstimate price elasticities in import and export equations, and many of them obtained mixed results (Bahmani - Oskooee, 1986 ; Goldstein & Khan, 1985 ; Khan, 1974 ; Warner & Kreinin, 1983 ; Wilson & Takacs, 1979). But these theories are mainly criticized because they did not check the stationarities of the data and hence the results seemed to be biased. As a result, recently, modern econometric techniques implying non-stationarities and reduced-form equation in the data were used, and many studies resulted to support the ML condition (Bahmani-Oskooee, 1998 ; Bahmani - Oskooee & Niroomand, 1998 ; Boyd, Caporale, & Smith, 2001).

A vast review of literature was done to understand the work done in this vital field. Alemu and Lee (2014) analyzed the Marshall - Lerner Condition for the selected 14 countries and found no evidence for the satisfaction ; however, the results were opposite when analyzed for the industrialized eight nations. A broad-spectrum acuity is that a nominal devaluation can trim down trade imbalances only if it translates into a real one and if trade flows respond to relative prices in a momentous and conventional manner (Calvo & Reinhart, 1995). A devaluation of the domestic currency proved to be lucrative and beneficial for the economy by escalating the global competitiveness of domestic industries (Kandil & Mirazaie, 2005). Dornbusch (1988) showed that the efficacy of depreciation to improve the balance of payments depended on redirecting demand in the right direction and by the correct amount and also on the capacity of the domestic economy to meet the additional demand through increased supply.

Bird (2001) argued that if inflation is on acceleration, then there is no course of action to keep the real exchange rate in equilibrium. Therefore, in his outlook, several developing countries selected flexible exchange rates

because of this reason, but this is not an idyllic elucidation since demand and supply elasticities may be fairly low even when they satisfy the Marshall-Lerner conditions, their response to exchange rate changes may not be as big as in developed economies.

The Marshall - Lerner condition and role of depreciation was also used as a tool to study specific materials such as the study conducted by Jain, Choudhury, and Jindal (2014) wherein they identified and selected the equipments which played a key role in construction of pipelines taking into account the rate of depreciation of pipeline construction equipments from 12 equipment users in India.

The research done so far on the developing countries are included in this paper and discussed here. By reviewing these studies, no definite conclusion can be drawn for developing countries. Ramachandran, Maran, and Kavitha (2008) studied the impact of collapse of dollar on the Indian economy and concluded that its effect was positive for the exporters. Eita (2013) found evidence in support of the Marshall - Lerner condition for Namibia using a cointegration model and also estimated income elasticities of trade for the country. Pandey (2013) tested the condition for India and concluded that the Marshall-Lerner condition was fulfilled. Canipe (2012) conducted a study in Ghana to test the ML condition prior to 1983 using OLS and panel regressions, and the theory was not agreed upon.

↳ **Theoretical Model and Concept :** Shahzad (2013) tried to estimate the relationship between the real exchange rate and the balance of trade for selected South Asian countries. The study used panel unit root test and Pedroni cointegration test. The study found no evidence for the satisfaction of the condition. In order to test the ML condition in Nigeria, unit root tests (ADF and PP), Johansen and Juselius approach for estimation of the multivariate cointegration system, and ordinary least square (OLS) were used. The results showed the evidence to support the theory. ML condition was tested for the Kenyan economy for the period from 1996 to 2011 by using the quarterly data on the log of real exchange rates. In particular, fractional integration and cointegration methods were used by Mudida (2012). The study concluded of a well defined relationship and agreed with the ML condition in case of the long run.

A study was conducted in Pakistan with time series quarterly data for 12 major trading partners by Aftab and Khan (2008). It used unit root test and ARDL model. It stated no evidence in support of the theory. Dornbusch and Krugman (1976) argued that there would be a perverse negative response of trade balance to currency depreciation, followed by a larger export elasticity that would improve the balance in the long run. The phenomena of domination of volume effect over the price effect in the long run is the Marshall-Lerner condition. If plotted over time, the trade response graph yields a J-resembling line, thus the J-curve terminology.

Research Methodology

In order to analyze the Marshall-Lerner condition for India, Pakistan, and Sri Lanka from 1985-2015, five variables are taken in this study, namely : exports, imports, gross national income (GNI), exchange rate, and the world income (GNI of 107 countries). The annual data for these variables were collected from the World Bank database in order to maintain the consistency of source. A model consisting of two equations has been formed, namely export equation and the import equation in order to estimate the export and import elasticity. However, prior to that ,all these data have been converted to Log in order to test stationarity and cointegration and to get the most accurate results as it was observed in the previous papers that many economists had not tested the series for cointegration and stationarity and this is very import in order to analyze the model, because if these are not satisfied, then this might lead to unreliable results. Hence, in this study, the series are tested for these. Therefore, a three step analysis is done to reach at the final conclusion.

The first step is to test for the stationarity of the series using unit root test by applying SAS software.

Afterwards, the series are tested for cointegration using Augmented Dickey - Fuller test by applying SAS software and finally, the model is run for the ordinary least square technique to find out the slope coefficients which are further used to find out the export and import demand elasticity.

$$\log X = B1 + B2\log WI + B3\log ER + a1 \text{---------- to calculate Export Elasticity} \quad \text{------(1)}$$

$$\log Y = B1 + B2\log DI + B3\log ER + a2 \text{---------- to calculate Import Elasticity} \quad \text{------(2)}$$

where,
X = Exports (as percentage of GDP),
Y = Imports (as percentage of GDP),
WI = world income ,
DI = domestic income (GNI),
ER = Real exchange rate (in terms of dollar),
$a1$ and $a2$ are the residual terms.

Data Analysis and Results

There are three sections namely India's Marshall-Lerner condition, Pakistan's Marshall-Lerner condition, and Sri Lanka's Marshall-Lerner condition. There are 4 tables in each section wherein the first two tables in each section show the stationarity and cointegration results and the next two tables display the OLS results of the exports equation and imports equation, respectively. Thereafter, the comparison among the three countries is drawn in the Conclusion section.

(1) India's Marshall - Lerner Condition (1985 - 2015) : It can be inferred from the Table 1 and Table 2 that as the time series are stationary and not cointegrated, thus we can proceed with the OLS technique to find out the export and import elasticity and conclude on the Marshall-Lerner Condition of India.

Hence, we can write the following equations using the results depicted in the Table 3 :

Table 1. Stationary Test for India (1985 - 2015)

Variable	Test Statistic	5% Critical Value	Result
Exchange Rate	2.77	3.41	Stationary
Indian Domestic Income	3.36	3.41	Stationary
World Income	3.27	3.41	Stationary
Exports from India	1.43	3.41	Stationary
Imports to India	0.91	3.41	Stationary

Source: Calculated from Appendix 1 using Unit Root Test via SAS

Table 2. Cointegration Test for India (1985 - 2015)

Model	Variables	Value	5% Critical Value	Result
Exports Equation	Exports, Exchange Rate, World Income	-4.67	-3.34	No Cointegration
Imports Equation	Imports, Exchange Rate, Domestic Income	-4.10	-3.34	No Cointegration

Source: Calculated from Appendix 1 using Augmented Dickey Fuller Test via SAS

Table 3. Export Equation of India (1985-2015)

Regression Statistics				
Multiple *R*	0.605020524			
R Square	0.366049834			
Adjusted *R* Square	0.32076768			
Standard Error	0.372193004			
Observations	31			
	Coefficients	***Standard Error***	***t - stat***	***P-value***
Intercept	-2.37698728	3.758826084	-0.632374902	0.532272334
Log World Income	0.320727238	0.75237955	0.426283832	0.673160463
Log Exchange rate	1.006753053	0.702189137	1.433734872	0.162721586

Source : Calculated using Appendix 1

Table 4. Import Equation of India (1985-2015)

Regression Statistics				
Multiple *R*	0.971179181			
R Square	0.943189002			
Adjusted *R* Square	0.939131074			
Standard Error	0.054186955			
Observations	31			
	Coefficients	***Standard Error***	***t - stat***	***P-value***
Intercept	-1.05556691	0.11084459	-9.522944797	2.79989E-10
Log Exchange rate	0.407154952	0.064978935	6.265953017	8.9742E-07
Log Domestic Income	0.574577961	0.05560272	10.33363047	4.64096E-11

Source : Calculated using Appendix 1

$$\log X = B1 + B2 \log WI + B3 \log ER + a1$$
$$X = -2.37 + 0.320\, WI + 1.00\, ER$$
$$\text{World Income Elasticity} = 1/0.320 = 3.125$$
$$\text{Export Elasticity} = 1/1.00 = 1$$

It can be inferred from the Table 3 that : (a) as multiple regression value is 0.60. So, it indicates that there is a normal level of correlation between the dependent (export) and independent variables (world income and exchange rate) ; (b) R^2 is 0.36. Therefore, 36 % of the variation in exports is explained by the variables : world income and exchange rate ; (c) a 1% appreciation in the real exchange rate causes the exports (as a percentage of GDP) to increase by 1% ; (d) a 1% increase in the world income causes 3.125 increase in the exports.

Hence, we can write the following equations using the results depicted in the Table 4 :

$$\log Y = B1 + B2 \log GNI + B3 \log ER + a1$$
$$Y = -1.055 + 0.574\, GNI + 0.407\, ER$$
$$\text{Domestic Income Elasticity} = 1/0.574 = 1.742$$
$$\text{Import Elasticity} = 1/0.407 = 2.457$$

It can be inferred from the Table 4 that : (a) as multiple regression value is 0.97. So, it indicates that there is a very high level of correlation between the dependent (import) and independent variables (domestic income and exchange rate) ; (b) R^2 is 0.94, which is a good fit as it means that 94% of the variation in imports is explained by domestic income and exchange rate ; (c) a 1% appreciation in the real exchange rate causes the imports to increase by 2.457% ; (d) a 1% increase in the domestic income causes 1.742 % increase in the imports.

↳ **The Marshall - Lerner Condition in India (1985 - 2015) :** Here, the affect of the changes in real exchange rate and the domestic income on the imports is represented in the value terms (price * quantity). Moreover, supply and demand quantities take time to adjust. There are various lap years involved. Apart from that, there are various factors which influence the imports of India discussed later in this paper. So, using export and import elasticity from the above, we can write the Marshall-Lerner condition of India as $= 1 + 2.457 = 3.457$. Therefore, since it is greater than 1, the Marshall-Lerner equation is justified for India for the period from 1985 - 2015. However, there are various points worth noting which have influenced the international trade. The 31 years (study period) witnessed the following dramatic changes :

(i) Financial reforms began in 1991 which contributed significantly to international trade.

(ii) In 2004, Indian ocean earthquake and Tsunami struck, affecting 14 countries and killing close to 3,00,000 people .

(iii) The year 2008 saw the great economic depression.

(iv) North India floods in 2013.

Also, the export elasticity is closer to 1. This indicates that there are domestic constraints or obstacles in the growth of India's international trade, which are discussed in the Discussion section.

(2) Pakistan's Marshall - Lerner Condition (1985 - 2015) : After analyzing for stationarity and cointegration in Tables 5 and 6, respectively. The export and import equation for Pakistan is represented in Table 7 and Table 8.

Table 5. Stationary Test for Pakistan (1985-2015)

Variable	Test Statistic	5% Critical Value	Result
Exchange Rate	1.36	3.41	Stationary
Pakistan Domestic Income	3.84	3.41	Stationary
World Income	3.94	3.41	Stationary
Exports from Pakistan	2.27	3.41	Stationary
Imports to Pakistan	1.67	3.41	Stationary

Source: Calculated from Appendix 2 using Unit Root Test via SAS

Table 6. Cointegration for Pakistan (1985-2015)

Model	Variables	Value	5% critical value	Result
Exports Equation	Exports, Exchange Rate, World Income	-3.87	-3.34	No Cointegration
Imports Equation	Imports, Exchange Rate, Domestic Income	-4.74	-3.34	No Cointegration

Source: Calculated from Appendix 2 using the Augmented Dickey Fuller Test via SAS

Table 7. Export Equation of Pakistan (1985-2015)

Regression Statistics				
Multiple *R*	0.349070236			
R Square	0.12185003			
Adjusted *R* Square	0.059125032			
Standard Error	0.059218116			
Observations	31			
	Coefficients	***Standard Error***	***t - stat***	***P- value***
Intercept	0.06653972	0.748249989	0.088927124	0.929772852
Log World Income	0.231335791	0.147426558	1.569159551	0.127843999
Log Exchange rate	-0.21427738	0.112883965	-1.898209144	0.068021102

Source: Calculated from Appendix 2

Table 8. Import Equation of Pakistan (1985-2015)

Regression Statistics				
Multiple *R*	0.585444193			
R Square	0.342744903			
Adjusted *R* Square	0.29579811			
Standard Error	0.049014194			
Observations	31			
	Coefficients	***Standard Error***	***t- stat***	***p - value***
Intercept	1.315881006	0.087712249	15.00224902	6.50228E-15
Log Exchange rate	-0.19762285	0.053450428	-3.697310812	0.000940182
Log Domestic Income	0.104631233	0.047393998	2.2076895	0.035627535

Source: Calculated from Appendix 2

Hence, we can write the following equations using the results depicted in the Table 7 :

$$\log X = B1 + B2 \log WI + B3 \log ER + a1$$

$$X = 0.06 + 0.23\, WI - 0.21\, ER$$

$$\text{World Income Elasticity} = 1/0.23 = 4.347$$

$$\text{Export Elasticity} = 1/0.21 = 4.761$$

It can be inferred from the Table 7 that : (a) The multiple regression value is 0.34. So, it indicates that there is almost no correlation between the dependent (export) and independent variables (world income and exchange rate) ; (b) R^2 is 0.12, therefore, 12 % of the variation in exports is explained by world income and exchange rate ; (c) a 1% appreciation in the real exchange rate causes the exports (as a percentage of GDP) to decrease by 4.761% ; (d) a 1% increase in the world income causes 4.347% increase in the exports.

*H*ence, we can write the following equations using the results depicted in the Table 8:

$$\log Y = B1 + B2 \log GNI + B3 \log ER + a1$$

$$Y = 1.31 + 0.104\, GNI - 0.19\, ER$$

$$\text{Domestic Income Elasticity} = 1/0.104 = 9.615$$

$$\text{Import Elasticity} = 1/0.19 = 5.263$$

It can be inferred from the Table 8 that : (a) as the multiple regression value is 0.58. So, it indicates that there is a normal level of correlation between the dependent (import) and independent variables (domestic income and exchange rate) ; (b) R^2 is 0.34 which is a good fit as it means that 34% of the variation in imports is explained by the domestic income and the exchange rate ; (c) a 1% appreciation in the real exchange rate causes the imports to decrease by 5.263% ; (d) a 1% increase in the domestic income causes 9.615% increase in the imports.

↳ **Marshall - Lerner Condition in Pakistan (1985 - 2015) :** Here, the affect of the changes in real exchange rate and the domestic income on the imports is represented in value terms (price * quantity). Moreover, supply and demand quantities take time to adjust. There are various lap years involved. Apart from that, there are various factors which influenced the imports of Pakistan, which are discussed later in this paper. So, using export and import elasticity from the above, we can write the Marshall - Lerner condition = 4.761 + 5.263 = 10.024. Therefore, since it is greater than 1, Marshall-Lerner equation is justified for Pakistan for the period from 1985 - 2015. However, there are various issues worth noting which might have affected the outcome. The theoretical aspect of the factors affecting the country's international trade are discussed in the Discussion section.

(3) Sri Lanka's Marshall - Lerner Condition (1985 - 2015) : After analyzing for stationarity and cointegration in Table 9 and Table 10, respectively, the export and import equation for Sri Lanka is represented in the Table 11 and Table 12.

Hence, we can write the following equations using the results depicted in the Table 11:

$\log X = B1 + B2 \log WI + B3 \log ER + a1$
$\text{Log } X = 2.06 - 0.09\ WI + 0.003\ ER$
World Income Elasticity = 1/ 0.09 = 11.11
Export Elasticity = 1/ 0.103 = 9.708

It can be inferred from the Table 11 that : (a) the multiple regression value is 0.21. So, it indicates that there is almost no correlation between the dependent (export) and independent variables (world income and exchange rate) ; (b) R^2 is 0.04, therefore, 4 % of the variation in exports is explained by the world income and the exchange

Table 9. Stationary Testing for Sri Lanka (1985-2015)

Variable	Test Statistic	5% Critical Value	Result
Exchange Rate	1.63	3.41	Stationary
Sri Lanka Domestic Income	3.49	3.41	Stationary
World Income	3.46	3.41	Stationary
Exports from Sri Lanka	2.78	3.41	Stationary
Imports to Sri Lanka	1.83	3.41	Stationary

Source: Calculated from Appendix 3 using Unit Root Test via SAS

Table 10. Cointegration for Sri Lanka (1985-2015)

Model	Variables	Value	5% critical value	Result
Exports Equation	Exports, Exchange Rate, World Income	-5.74	-3.34	No Cointegration
Imports Equation	Imports, Exchange Rate, Domestic Income	-5.63	-3.34	No Cointegration

Source: Calculated from Appendix 3 using Augmented Dickey Fuller Test via SAS

Table 11. Export Equation of Sri Lanka (1985-2015)

Regression Statistics				
Multiple *R*	0.214937373			
R Square	0.046198074			
Adjusted *R* Square	-0.02193063			
Standard Error	0.0886221			
Observations	31			
	Coefficients	***Standard Error***	***t - stat***	***p - value***
Intercept	2.067153385	1.361829653	1.517923612	0.140244783
Log World Income	-0.09804856	0.290135723	-0.337940335	0.737928858
Log Exchange rate	0.103133164	0.25532675	0.012271194	0.990296268

Source : Calculated using Appendix 3

Table 12. Import Equation of Sri Lanka (1985-2015)

Regression Statistics				
Multiple *R*	0.757471007			
R Square	0.573762326			
Adjusted *R* Square	0.543316778			
Standard Error	0.043099082			
Observations	31			
	Coefficients	***Standard Error***	***t - stat***	***p-value***
Intercept	2.003748477	0.080355366	24.93608791	1.16042E-20
Log Exchange rate	0.373965933	0.08619044	4.338833093	0.000168399
Log Domestic Income	-0.36868609	0.064426817	-5.722556307	3.87089E-06

Source : Calculated using Appendix 3 Regression Statistics

rate ; (c) a 1% appreciation in the real exchange rate causes the exports (as a percentage of GDP) to decrease by 9.708% ; (d) a 1% increase in the world income causes 11.11 % decline in the exports.

Hence, we can write the following equations using the results depicted in the Table 12 :

$$\log Y = B1 + B2 \log GNI + B3 \log ER + a1$$
$$\text{Log } Y = 2.003 - 0.36\, GNI + 0.37\, ER$$
$$\text{Domestic Income Elasticity} = 1/0.36 = 2.77$$
$$\text{Import elasticity} = 1/0.37 = 2.702$$

It can be inferred from the Table 12 that : (a) the multiple regression value is 0.75. So, it indicates that there is a normal level of correlation between the dependent (import) and independent variables (domestic income and exchange rate) ; (b) R^2 is 0.57, which is a good fit as it means that 57% of the variation in imports is explained by domestic income and exchange rate ; (c) a 1% appreciation in the real exchange rate causes the imports to increase by 2.702% ; (d) a 1% increase in the domestic income causes 2.77% decrease in the imports.

↳ **Marshall - Lerner Condition in Sri Lanka (1985 - 2015) :** Here, the affect of the changes in real exchange rate and the domestic income on the imports is represented in the value terms (price * quantity). Moreover, supply and

Table 13. Country - Wise Comparison

Variable/Country	India	Pakistan	Sri Lanka
Export Elasticity	1	4.761	9.708 (Highest)
Import Elasticity	2.457	5.263(Highest)	2.702
World Income Elasticity	3.125	4.347	11.11 (Highest)
Domestic Income Elasticity	1.742	9.615	2.77
Marshall-Lerner Condition	3.457 (Verified)	10.024(Verified)	12.41 (Verified) (Highest)

Source: Compiled from Tables 3, 4,7,8,11, and 12

demand quantities take time to adjust. There are various lap years involved. Apart from that, there are various factors which influenced the imports of Sri Lanka which are discussed later in this paper. So, using export and import elasticity from the above, we can write the Marshall -Lerner Condition = 9.708 + 2.702 = 12.41. Therefore, since it is greater than 1, the Marshall - Lerner equation is justified for Sri Lanka for the period from 1985 - 2015.

Discussion and Conclusion

The results (from Table 1 to Table 12) show that the Marshall-Lerner condition is satisfied in case of India, Pakistan, and Sri Lanka, though there is a difference in the degree of satisfaction. Broadly, we can conclude and compare the outcomes of the three countries in the Table 13 in order to have a clear look at these country's economies. The data were taken from World Bank (n.d.) and is represented in Appendix 1 (Indian variables from 1985 - 2015), Appendix 2 (Pakistan variables from 1985 - 2015), and Appendix 3 (Sri Lanka variables from 1985 - 2015). So, as we can see that the condition is satisfied in case of all the three countries. The result implies that depreciation will be helpful in improving India's economy, but there are certain domestic constraints which are listed below:

↳ **Bottlenecks Faced by India to Increase Exports :** Former Prime Minister, Dr. Manmohan Singh revealed in one of his studies that it is India's own domestic policies which are creating obstacles for the export-oriented growth in India. Complementary to this, the great economist Amartya Sen said that to see development in the export sector of the country, a literate workforce and female empowerment are indispensable instruments. On the other hand, Montek Singh Ahluwalia gave importance to the infrastructural development for the growth of the country. He said that during the reform period, India experienced a boom in the international market for some time in spite of the low infrastructure level, but now, since all the little available is used up to the maximum, there is need to pay attention to this crucial part of the economy. In order to do so, one way is to adopt a pro-active approach to involve the private sector to the maximum and to create the pre-conditions for financing private infrastructure projects. On the other hand, Ashok Gulati argued that now the time has come to give importance to institutional reforms and for the public investment in canal irrigation and organic farming. Moreover, various plans under the Planning Commission initially focused on the service sector, but the studies have shown that now the service sector has reached a saturation level. Therefore, this is the correct time to put emphasis on the manufacturing sector. Apart from the above domestic constraints, there are some economic situations that also played a significant role in the foreign trade of the country. One of the major economic phenomenon was the recession of 2007 - 2008.

The following are the obstacles that the three countries face for improving their economies and the following are the suggestions that can be implemented by the countries :

(i) India : Due to high cost of domestic production, the industrial sector is craving for modernization, diversification, capacity building ; the prevalence of rampant poverty and unemployment required and high subsidies were given. India needs a change in the domestic policies such as high public investment in the required areas (infrastructure of the industrial sector) to modernize and diversify the industrial sector. Moreover, welfare programmes are needed in order to remove the obstacles in the country such as illiteracy and poverty. Therefore, a proper policy mix on the domestic front is the need of the hour. Many programmes such as 'Make in India' have been launched by PM Modi. It is hoped that these programms become a success and help India reach the top of the ladder of development.

(ii) Pakistan: Pakistan is plagued with poor infrastructural facilities ; is unable to take advantage of the international agreements ; faces regulatory issues ; and the biggest issue the country facing is terrorism and a poor state-controlled market. Therefore, Pakistan needs immediate policies to recover its damaged economy, stabilize it, and then follow the track of development.

(iii) Sri Lanka : The Sri Lankan civil war which lasted for 25 years from 1983 to 2009 caused great hardships for the growth of the economy. In addition, there are other domestic constraints which this country is grappling from such as cultural survival for Tamils. Thus, very less focus has been placed to improve the international trade and make it a path for development of the economy.

The depreciation of domestic currency of India, Pakistan, and Sri Lanka will be highly beneficial for the economy as the Marshall- Lerner condition is satisfied with a very high export - elasticity.

Research Implications

This study has made an attempt to use the old theoretical base to understand the current scenario in India, Pakistan, and Sri Lanka. The Marshall - Lerner condition is being satisfied (greater than 1) as shown in the data analysis section, which indicates that with depreciation, their BOT situation can improve in the current time when these countries are grappling with deficits and strained balance of trade. But these countries are facing domestic constraints in various senses as discussed in the previous section, which are creating hurdles in their path of development using international trade.

In the recent time, very few studies have been conducted to analyze this condition. Sek and Har (2014) showed that the Marshall-Lerner condition was not satisfied in the five pairs of bilateral trades between Malaysia and its main trading partners of China, EU, Japan, Singapore, and U.S., respectively. In comparison to this, our study has validated the existence of the condition in India, Pakistan, and Sri Lanka but these are South Asian economies and their total trade is taken into account, which may be the reason for the difference in the results. Begum and Alhelal (2015) tested the condition for the Bangladesh economy (1985-2014) and showed that the condition held in the long run. This is also a South Asian country as the countries which are taken in our analysis. So, a strong impetus is required in India, Pakistan, and Sri Lanka to realize the gains from depreciation of their respective exchange rates.

Limitations of the Study and Scope for Further Research

The primary data was not available which could have provided more impetus to the study, hence the analysis is done through secondary reliable sources such as World Bank data. This paper has successfully analyzed India, Pakistan, and Sri Lanka's foreign trade situation taking total exports and total imports into consideration. The

Marshall-Lerner condition is proved in case of all three countries. But even then the exports are not able to rise to the potential level and the reason for the same are the domestic constraints except from some world economic situations in case of all the three countries. Therefore, this paper provides the track on which the three countries, especially India, can walk to achieve the level of a developed country. The conclusion can be used to form major policies contributing to the development. The study can be further extended by analyzing the manufacturing sector and the important industries which are considered to be the backbone of the economy as these industries fuel growth, productivity, and employment and strengthen other sectors of the economy.

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APPENDICES

Appendix 1. Variables of India

Year	Log Exports	Log World Income	Log Exchange rate	Log Domestic Income	Log Imports
1985	0.71298576	5.79	1.092325812	2.477121255	0.875855
1986	0.708137487	5.84	1.100743786	2.505149978	0.838976
1987	0.740992959	5.91	1.112655264	2.556302501	0.83632
1988	0.773142907	5.99	1.143548228	2.602059991	0.864911
1989	0.838547463	6.03	1.210198089	2.602059991	0.903714
1990	0.840845267	6.03	1.243124899	2.591064607	0.919456
1991	0.921574385	6.06	1.35683693	2.544068044	0.921536
1992	0.939045854	6.1	1.413602882	2.544068044	0.974276
1993	0.985189625	6.11	1.484204308	2.51851394	0.984443
1994	0.987562006	6.12	1.496566328	2.544068044	1.000627
1995	1.027638047	6.16	1.510907798	2.579783597	1.07248
1996	1.008863398	6.18	1.549410049	2.612783857	1.054818
1997	1.021456664	6.19	1.560065548	2.62324929	1.069042
1998	1.034571079	6.18	1.61552254	2.62324929	1.095603
1999	1.051333608	6.18	1.634027914	2.653212514	1.118371
2000	1.106300833	6.2	1.652648578	2.662757832	1.13558
2001	1.091383426	6.2	1.673816975	2.672097858	1.120683
2002	1.146702838	6.24	1.686728473	2.672097858	1.175557
2003	1.167030405	6.32	1.668230103	2.72427587	1.186812
2004	1.244309994	6.38	1.65625604	2.799340549	1.285695
2005	1.285110382	6.42	1.644438343	2.86923172	1.342917
2006	1.323653718	6.47	1.656165386	2.913813852	1.384323
2007	1.310287378	6.49	1.616460109	2.982271233	1.388195
2008	1.372934918	6.44	1.638541003	3.021189299	1.457401
2009	1.302106216	6.42	1.684892617	3.068185862	1.405301
2010	1.341835909	6.44	1.660161428	3.11058971	1.420583
2011	1.377792921	6.43	1.669042143	3.161368002	1.480168
2012	1.380143147	6.45	1.727843965	3.190331698	1.487649
2013	3.303843775	6.35	1.767881648	3.195899652	1.453486
2014	1.362293938	6.45	1.78	3.19	1.415307
2015	1.2999429	6.45	1.76	3.19	1.347525

Source : World Bank (The values have been converted into log by us)

Appendix 2. Variables of Pakistan

Year	Log Exports	Log World Income	Log Exchange rate	Log Domestic Income	Log Imports
1985	1.018007271	5.79	1.202171926	2.568201724	1.358205
1986	1.07557427	5.84	1.221349241	2.556302501	1.355386
1987	1.121718369	5.91	1.240519296	2.591064607	1.322294
1988	1.133105138	5.99	1.255351917	2.62324929	1.335863
1989	1.142486769	6.03	1.312631978	2.612783857	1.337399
1990	1.191403695	6.03	1.336607309	2.612783857	1.368681
1991	1.230370821	6.06	1.376590947	2.612783857	1.268525
1992	1.239532254	6.1	1.399375871	2.633468456	1.312358
1993	1.212360094	6.11	1.448817326	2.643452676	1.35104
1994	1.211721499	6.12	1.485247015	2.643452676	1.27977
1995	1.222975661	6.16	1.500273305	2.672097858	1.288311
1996	1.227966406	6.18	1.55725068	2.681241237	1.330962
1997	1.206338795	6.19	1.613963587	2.681241237	1.317443
1998	1.21708345	6.18	1.65366266	2.653212514	1.243706
1999	1.186207374	6.18	1.694611267	2.653212514	1.229591
2000	1.12844207	6.2	1.729555046	2.672097858	1.166971
2001	1.166120331	6.2	1.791881175	2.681241237	1.196231
2002	1.182517855	6.24	1.776147299	2.698970004	1.185089
2003	1.223209451	6.32	1.761567004	2.73239376	1.207514
2004	1.194983058	6.38	1.765354552	2.792391689	1.16534
2005	1.195608977	6.42	1.774622607	2.851258349	1.291453
2006	1.150263945	6.47	1.780110811	2.903089987	1.333402
2007	1.121054463	6.49	1.783464176	2.949390007	1.296134
2008	1.092801704	6.44	1.847622214	2.995635195	1.365711
2009	1.093272894	6.42	1.91229058	3.017033339	1.293939
2010	1.130856789	6.44	1.930408073	3.025305865	1.286741
2011	1.144892613	6.43	1.936229062	3.056904851	1.277941
2012	1.091020702	6.45	1.970324544	3.096910013	1.306668
2013	1.10530561	6.35	2.007017222	3.139879086	1.274647
2014	1.0890958	6.45	2.004751535	3.706718	1.272413
2015	1.024485668	6.45	2.006	3.71	1.230704

Source : World Bank (The values have been converted into log by us)

Appendix 3. Variables of Sri Lanka

Year	Log Exports	Log World Income	Log Exchange Rate	Log Domestic Income	Log Imports
1985	1.4151739	5.79	1.433971072	2.579783597	1.579385738
1986	1.375081704	5.84	1.447426797	2.612783857	1.548135664
1987	1.401267396	5.91	1.469007871	2.643452676	1.55262424
1988	1.416248278	5.99	1.502519295	2.662757832	1.566281549
1989	1.435529099	6.03	1.556870131	2.653212514	1.565337362
1990	1.479730812	6.03	1.602742564	2.672097858	1.580504278
1991	1.458503188	6.06	1.616701267	2.698970004	1.589444963
1992	1.502022328	6.1	1.641767755	2.748188027	1.613137318
1993	1.528929637	6.11	1.684146406	2.785329835	1.636954151
1994	1.529082212	6.12	1.693860045	2.806179974	1.659135355
1995	1.551421074	6.16	1.709707336	2.84509804	1.663110977
1996	1.543737082	6.18	1.742500812	2.86923172	1.642470712
1997	1.562746175	6.19	1.770812298	2.897627091	1.639480864
1998	1.559233949	6.18	1.809223719	2.908485019	1.625838744
1999	1.550028957	6.18	1.849022716	2.913813852	1.636164549
2000	1.591239516	6.2	1.886519583	2.934498451	1.695663347
2001	1.572071939	6.2	1.951254992	2.919078092	1.639161897
2002	1.542991276	6.24	1.980739751	2.934498451	1.617228984
2003	1.53974714	6.32	1.984621592	2.977723605	1.609410243
2004	1.548154734	6.38	2.005156727	3.029383778	1.644950796
2005	1.509698021	6.42	2.002157642	3.08278537	1.61560395
2006	1.478977901	6.47	2.016675926	3.130333768	1.614186705
2007	1.46411679	6.49	2.043846348	3.187520721	1.596503761
2008	1.395177591	6.44	2.034763828	3.247973266	1.585771466
2009	1.32895759	6.42	2.060489266	3.294466226	1.444369228
2010	1.349798623	6.44	2.053326191	3.354108439	1.486922513
2011	1.362766332	6.43	2.043618487	3.411619706	1.575283917
2012	1.358576972	6.45	2.105862088	3.463892989	1.562275247
2013	1.351658422	6.35	2.110822049	3.501059262	1.505161338
2014	1.320354033	6.45	2.13	3.54	1.461048092
2015	1.312177356	6.45	2.12	3.61	1.446381812

Source : World Bank (The values have been converted into log by us)

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