Indo-Latin American Trade: Evidence of 'J' Curve

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Abstract

The new trade policy had an immense impact on the direction and composition of trade. India has also managed a floating exchange rates regime which heavily impacts on its trade deficits and balance of payment accounts. With greater openness in trade, exchange rates volatility has been increased and it became important for policy makers to stabilize the economy by balances in export and imports with new countries. In this context estimation of J curve becomes important to analyze the impact of exchange rate fluctuation on the long run and short run trade relations India has with its trading partners.

This paper examines the evidence of J-curve for India in context of its international trade with five major Latin American economies i.e. Argentina, Brazil, Mexico, Chile and Colombia. A J-curve hypothesizes that after taking real depreciation of any currency, the trade balance is anticipated to decrease at first, then improve because once devaluation takes place firstly it increases the value of exports and increased exports would outweigh the increased value of imports after a period time. The analysis is important because India's bilateral trade potential with Latin American economies remains relatively under-exploited and it has tremendous potential for growth.

Introduction

A major programme of economic reform and liberalization was undertaken in 1991 with an emphasis on external sectors. The new trade policy has completely changed the direction and composition of trade. The basic focus of the liberalization was to increase the growth of capital goods, inputs for industries and encourage domestic export- oriented growth. India has also managed a floating exchange rates regime which highly impacts on the balance of payment accounts because India has started its trade with new partner countries and hence India also faced trade deficits. With the greater openness in trade, exchange rates volatility has increased and it became important for policy makers to stabilize the economy by balances in export and imports with new countries. Therefore estimation of J-curve became important in the long run and short run trade relations with new partners.

Developing and emerging economies like India and Latin America participated extensively in the acceleration of global integration, although some have done better than others. These countries widely varying experience with integration over the past ten years and explore the causes and implications of the large disparities. The developing countries were not much affected by the 2008 financial crisis because they did not completely depend upon US market. So, the importance of intra- developing countries trade prove that if a developed economy like the US after 2008, UK after Brexit and Greece after Euro crisis get collapse then it will not have much effect on these developing economies.

It is witnessed that over the past two decades, development in the three broad product categories of world merchandise trade has differed sharply because of slicing of the dependence of developing countries on developed countries. The value of exports of mining products (mainly consist of fuels) and agricultural products rose up to four to five times, those of manufactured goods increased nine times after intra-developing countries trade initiated.

Trade and investment relations between India and Latin America have improved over the years. Their economies are complementary to each other with similar demand patterns from their low and middle-class

income populations. Latin American exporters are focused on exploiting the opportunities of the large and growing market of India. India and LA enjoyed the benefits of Bilateral trade and it has increased its total percentage in trade about 858% since 2000. Despite the growth opportunities, the bilateral trade is far below its potential. India has now an intense economic presence from North America to South America and the Caribbean to Uruguay, and its interests are remarkably diverse. Since 2000, Indian companies have invested about $12 billion in the region in information technology (IT), pharmaceuticals, agrochemicals, mining, energy, and manufacturing. Among the leading firms operating in the Americas today are the IT firm Tata Consultancy Services (TCS), Dr. Reddy's Laboratories (pharma), United Phosphorus (agrochemicals), Shree Renuka Sugars, Havells Sylvania (lighting equipment), Videocon (television), and ONGC Videsh (oil).

The World Bank report shows that Brazil and Mexico have 60 percent manufactured goods in trade basket for India. While, India is importing soyabean oil at a massive level from Argentina. So overall we can say that these Latin American countries have so much potential in trade but in particular, India's trade potential with Latin American countries has not been fully exploited and there is a tremendous scope for growth. So, again we can deduce that there is a need for empirical testing for the long run and immediate (short run) benefits of trade with these countries.

This paper examines the evidence of J-curve for India in a context of its International trade with five major Latin American economies i.e. Argentina, Brazil, Mexico, Chile, and Colombia. A J-curve hypothesizes that after taking real depreciation of any currency, the trade balance is anticipated to decrease at first, then improve because once devaluation takes place firstly it increases the value of exports and increased exports would outweigh the increased value of imports after a period time. The analysis is important in the light of Latin American economies because it was highly restricted prior to 2000 in terms of bilateral trade with India.

In what follows, the study will first discuss some of the reasons for currency depreciation, followed by a review of the literature on the empirical literature on the J curve. Next it will present the empirical model, data sources, and results, and finally, present the main conclusion which is emerged from the analysis.

Traditional Macroeconomic Causes of Currency Depreciation

Several factors may be responsible for bringing about depreciation in the exchange rate of a country. These include:

1. Higher Inflation in the economy
2. Demand and Supply cause
3. Higher fiscal deficit.
4. Wider current account deficit.
5. Increased prices of oil in International market.
6. Strengthening of US economy.
7. Low Forex Reserves.
8. Higher demand for gold.

9. Strengthening of the dollar against all the currencies.
10. Outflow of money or withdrawal by investors.
11. Unclear or unsupportive policy reforms.
12. Higher stock exchange volatility in stock market.
13. Differences in interest rates.

Review of Literature

Exchange rates fluctuations have the short run and long run effects and sometimes these may run in opposite directions. Most studies attempt to check whether there is a long-run favorable effect of exchange rate movements on the trade balance and whether the short-run effect is different. In other words, they look for evidence of a J-curve. Empirical evidence on the J-curve hypothesis is mixed. Some of the studies shows that J-curve supports the pieces evidences of long run balance of payment account will be offset by the exports in short run while others say that short run adjustment will automatically take care of balance of payment accounts the in long- run. Other economist and policy makers like Himarious (1985), Krugman and Baldwin (1987), Bahami (1992), Demirden and Pastine (1995), Gupta-Kapoor and Ramakrishnan (1999), Tatchawan (2001), Lal and Lowering (2002a) found the evidence of J-curve effect. Jaleel (2002), Onafowora (2003), Dollery (2012), Yagici (2012, 2016) found that Marshall-Lerner condition holds in the long-run with varying degree of J-curve effect in the short-run.

On the other hand, some of the scholars did not get through J-curve effects. The studies carried by Miles (1979), Rose and Yellen (1989), Shirvani and Wilratte (1997), Bahmani-Oskooee and Brooks (1999), Wilson and Tat (2001), Lal and Lowinger (2002b), Bahmani-Oskooee and Goswami (2003) and Akbostanci (2004) did not find the existence of J-curve. However, Marwah and Klein (1996), Bahmani Oskooee M. and Bolhasani M. (2008), Bahmani Oskooee M. and Kutan M. (2009), Bahmani Oskooee M. and Cheema J. (2009), umoru (2913) got some mixed results.

On the basis of available literature we can say that on an International level, empirical evidence on the J-curve hypothesis is mixed. Some possible reasons for differences and inconsistencies in the findings could be the use of different methodologies, different estimation techniques, data, sample period and countries taken into consideration.

In Indian context studies carried were also found to be inconclusive. They have also shown a number of mixed results. Bahmani-Oskooee (1985, 1989) and Bahmani Oskooee and Malixi (1992) mentioned that Indian trade balance deteriorates with devaluation in both short-run and long-run. On the opposite side, Himarios (1989) found no evidence of J-curve, but found devaluation improves India's trade balance. Contrary to these above studies, Bahmani-Oskooee (1991), Bahmani-Oskooee and Alse (1994) and Buluswar*et al.* reported that depreciation of the rupee had no long-run effect. In contrast to Buluswar*et al.,* Kulkarni (1996), reported that trade balance had deteriorated in the initial period but increased in the long-run. Bahmani Oskooee M. and Mitra R.(2009), tested the short-run 5 effects of the

real depreciation of rupee as well as its long-run effects on the trade balance of 38 industries, only 22 industries responded significant to the real value of the rupee in the short-run, only in 8 industries did the J-curve received support.

Despite the amount of research into how exchange rate changes affect trade balance, there is still considerable disagreement concerning the effectiveness of currency devaluation as a tool for increasing a country's trade balance. The empirical results from these studies (including for India) are inconclusive. So it appears worthwhile to re-examine the relationship between trade balance and exchange rate.

Objective of the study

To test the depreciation of currency is helpful for India to reduce the trade deficit and increase exports.

Importance of J curve Estimation for India

Before going into the results and discussion it is essential to know what actually J curve is and why do we calculate it. It has own importance in economics because it tells us about the performance of the economy as currency depreciates. Marshal-Learner model has been used to access the impact of devaluation of currency on merchandise trade.

Marshal-Learner condition can be written as:
$$|\beta x| + |\beta m| > 1$$

Where **βx** and **βm** denote the export and import elasticity.

The theoretical ground of the J-curve comes from Marshall and Lerner condition. The Marshall-Lerner condition states that the sum of absolute values of export and import demand elasticity and has to be at least one for the currency devaluation to have a positive impact on trade balance. The impact of a weaker currency is analyzed by price and volume effects. With cheaper export prices, the volume of exports may not change substantially, the export revenues will not increase.

The devaluation impact can be divided into three parts: the contract period, pass through period and the adjustment of quantity period. Contracts period has already negotiated before the currency weakens will keep both exports and imports inelastic to price. The following period sees quantities unaffected as the impact of depreciation comes in. Mainly in the third period, the volumes start adjusting to the prices. The sequence of these effects creates looks like J shape of the curve. This paper seeks to explore the evidence of the J curve in India in the face of the weakening rupee, with specific reference to India's trade with selected Latin American countries (Argentina, Brazil, Chile, Columbia and Mexico).

The one and prime objective of the paper is to check the applicability of J curve in relation with aforesaid Latin American countries. Mostly these types of works are carried with help of secondary data. So, this study has also been carried with the help of secondary data. The required data for the study was collected and compiled from the RBI Website and Bulletin. Study, covers a period of twenty years from 1995 to 2015. Because above mentioned economies removed bilateral trade barriers from India. In addition to it for the calculation of macroeconomic indicators data was collected from World Bank and IMF website. Collected data has been used for analysis with the help of statistical tools like standard deviation (S.D), Correlation.

The data for exchange rates, GDP of India and GDP of others have been taken from the *World Bank database.* Exports to and imports from India have been collected from *World Integrated Trade Solutions (WITS) database.* The balanced panel for countries with annual data of 20 years (1995-2015) has been created. After going through the literature study found that results will be more appropriate if it took monthly or quarterly data but for time being it has taken annual data because of data crunch in the case of some Latin American countries.

The Model

To measure the elasticity of the trade balance with respect to the exchange rate, gdp of domestic country and gdp of other country, equation below can be expressed as a log-log equation:

$$\text{Ln } TB_{it} = \alpha_1 + \alpha_2 \ln E_{it} + \alpha_3 \ln Y_{it} + \alpha_4 \ln Y^*_{it}$$
$$\text{Ln } TBC_{it} = \alpha_1 + \alpha_2 \ln EXC_{it} + \alpha_3 \ln GDPIND_{it} + \alpha_4 \ln GDPOTH_{it}$$

Where,

$TB_{it} = (X_b - M_b)$, Bilateral exports and import difference between India and other country.

X_b = Bilateral Exports,

M_b = Bilateral Imports,

E_{it} = Nominal Exchange Rates with respect to US $.

Y_{it} = Nominal GDP India.

Y^*_{it} = Nominal GDP Others.

a_2 measures the elasticity of the trade balance with respect to exchange rates, a_3 denotes the elasticity of trade balance w.r.t. gdp of domestic country and a_4 denotes the elasticity of the trade balance w.r.t. gdp of foreign country.

Empirical Results

Before going into detailed results we briefly discuss preconditions to use VECM. To use vector error correction model we have to make sure that all the variables should be in same order if it is not happening then we cannot run VECM. So, we have checked the stationarity of all dependent and independent variables and all the variables were found to be non-stationary at the level of 5%. Therefore first difference of all the variables we take and they were made stationary, i.e. all the variables were I(1).

Table 1.1

Unrestricted Fisher Cointegration Rank Test (No Deterministic Trend)				
Hypothesized No. of CE(s)	Trace Statistic	Prob.**	Eigenvalue	Prob.**
None *	85.04	0.0000	53.40	0.0000
At most 1	44.37	0.0000	36.50	0.0001
At most 2	18.48	0.0474	17.48	0.0643
At most 3	10.36	0.4099	10.36	0.4099
Lag Intervals (in first Difference): 1to 4				

Table1.1 presents the fisher panel cointegration test. The results of this test are based upon maximum eigen values and trace statistics test. The table above shows that both the criteria of max eigen and trace statistics has rejecting the null hypothesis of at 5% level of significance, that there is no cointegration relationship between India and other countries. The 'p' values of maximum eigen values (0.00) and trace statistics (0.00) shows that there are at most two cointegrating vector equations which have long run association with each other. So we are rejecting null hypothesis of no cointegrating in the long run.

Table 1.2

Pedroni Residuals Cointegration Test (No Deterministic Trend)				
Alternative hypothesis: common AR coefficients. (within-dimension)				
	Statistic	Prob.**	Weighted Statistics	Prob.**
Panel v-Statistic	-0.309778	0.6216	-1.571278	0.9419
Panel rho-Statistic	0.201609	0.5799	0.503618	0.6927
Panel PP-Statistic	-2.864451	0.0021	-2.442723	0.0073
Panel ADF-Statistic	-4.446446	0.0000	-4.738644	0.0000
Alternative hypothesis: individual AR coefficients. (between-dimension)				
Group rho-Statistic	1.510363	0.9345		
Group PP-Statistic	-2.871140	0.0020		
Group ADF-Statistic	-5.605766	0.0000		

The study has also cross checked the results of long run cointegration by an alternative test, namely pedroni residuals cointegration test. The table 1.2 also shows the long run association between trade balance and other independent variables. As the pedroni residuals results shows that there are more than 50 percent values of the model are significant (i.e. six out of eleven). More than half values of the between dimension and within dimension coefficients are significant which is again rejecting the null hypothesis of no cointegration in the model.

Table 1.3 Cointegration Test Estimates

Cointegrating Equation	CointEq1	CointEq2
LNTBC(-1)	1.000000	0.000000
LNEXC(-1)	0.000000	1.000000
LNGDPIND(-1)	0.004401	-4.706102
Std. error	(0.00193)	(1.13520)
t-statistic	[2.27760]	[-4.14563]
LNGDPOTH(-1)	-0.002412	3.350031
Std. error	(0.00107)	(0.62956)
t-statistic	[-2.25059]	[5.32124]
CONSTANT ©	-11.32383	15.90441

Trade balance is negatively associated with the exchange rate which exhibits that if exchange rate decreases then trade balance will improve, as expected by the theory. On the other hand we have positive relationship between trade balance and gdp of India. Because as gdp of India increases trade balance will also increase. But for other countries trade balance is showing a negative relationship which is again desirable because as gdp increase it will lead to more exports rather than imports to domestic country.

Table 1.3 and 1.4 shows that equation C(1) or cointegrating equation one is main equation and shows the long term causality running from exchange rates, gdp of domestic country and gdp of foreign country to dependent variable trade balance. It also shows that if depreciation takes place in the economy then whole system will be back to the equilibrium position in the long run. The values of C(1) are negative and significant at 1% which shows that the depreciation will be effective and whole system will be

get back to long run equilibrium with the speed of adjustments at 34 percent per annum.

Table 1.4 Error Correction Model Estimates

| Error correction	D(LNTBC)	D(LNEXC)	D(LNGDPIND)	D(LNGDPOTH)
CointEq1	-0.344674	-5.429847	3.348384	6.927662
Std. error	(0.12617)	(5.78648)	(2.79151)	(5.73383)
t-statistic	[-2.73184]	[-0.93837]	[1.19949]	[1.20821]
P value	**0.0067*****	0.1001*	**0.0823****	0.2279
CointEq2	0.000125	-0.009530	-0.001539	0.000819
Std. error	(0.00017)	(0.00785)	(0.00379)	(0.00778)
t-statistic	[0.73030]	[-1.21399]	[-0.40633]	[0.10532]
P value	0.4657	0.2257	**0.0917***	0.1032

*** Significant at 1%, **significant at 5%, *Significant at 10%

The paper has also investigated the short run cointegration in the model by performing wald test. The results of wald test are not rejecting the null hypothesis of no short run cointegration in the model hence, we can say that the variable in the model are not much affected in the short run. And also we can say that there is no short run causality is running from the independent variables (Exchange rates, GDP of domestic country and GDP of foreign country) to dependent variables.

So, the overall model is showing the evidence of J-curve for India w.r.t. these selected Latin American countries (Argentina, Brazil, Columbia, Chile and Mexico) and there are also the signs of long run positive trade balance with these economies .As short run causality test (wald) failed to detect short run association among the variables of this model hence, in short run there is no evidence of J curve. Impulse responses also exhibiting that trade balance is declining at first stage and then improving with respect to exchange rates and other countries gdp.

Impulse Response Function

Response to Nonfactorized One S.D. Innovations
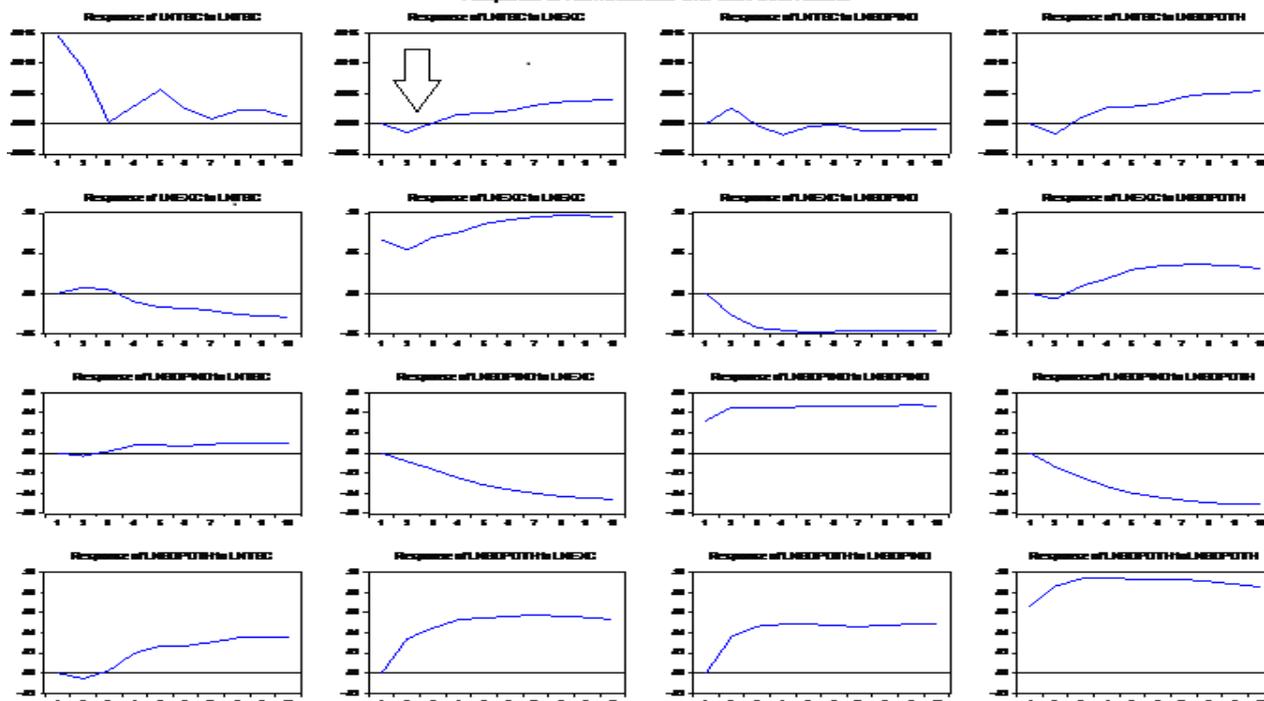
Conclusion

As Indian economy is growing current account deficit has also became wider because imports of both primary and secondary essentials (i.e.) oil and manufacturing products are increasing. Despite the dramatic rise in the software exports current account deficit has remained elevated up to a level. Apart from rising CAD, financing CAD has also been seen as a concern as most of these capital inflows are short-term in nature. The problem of CAD is the major concern for every govt. since 1991 or prior to it. They always suggested different ways to bring down the CAD, they usually suggested to boost up the exports but oil prices in International market is

continuously increasing so the policy of export promotion gets ineffective.

On the other hand Latin American economies liberalized their trade relations in terms of volume and value. There are some positive and also negative impacts for these countries if currency depreciation took place but for Indian prospective currency depreciation playing adverse role in trade balance in short run. Imports of India from these countries are keep on increasing which clearly shows that there are no signs for adjustment in balance of payment accounts in short run. But in long run there is scope of increasing India's exports with Latin

Remarking An Analisation

America. Long run results indicate that trade balance improves as Indian rupee depreciates.

The results show that there is a long run relationship between trade balance, GDP and exchange rates so we may conclude that manufacturing goods which are massively traded by these countries. Latin Americans are consistently importing to and from India goods because of lower value of rupee in their country. On the other side if policy makers keep on depreciate the Indian currency there will be more severe consequences may be faced by India. Impulse response function shows that on one side we are increasing trade balance with these countries but overall GDP of India is falling. But due to change in the recent government in India and America can influence the current trade pattern because President Donald Trump is using more protective measure as compare to the existing trade policies. So, Indian Policy makers have to choose a midway to increase trade balance and depreciation.

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