Impact of Globalisation on India’s exports with special reference to Regional Trade Agreements

Niti Bhasin* and Rinku Manocha**

ABSTRACT

Coinciding with the era of globalisation, there has been a rise in the number and depth of Regional Trade Agreements (RTAs) in the Asian region. As India has also been a part of this growing trend, this paper attempts to identify the determinants of India’s exports with special focus on the role of globalisation and RTAs of India. We employ panel data regression on an augmented gravity model to examine the effects of these variables. To capture the globalisation effect, we have included trade openness of the host country. For RTAs, we have taken two variables; one which indicates the presence or absence of an RTA in a given year; and second is the number of RTAs between India and its partner country. Using data for nine countries which are India’s trading partners over the period 1991-2012, we find that GDP and GDP per capita of the host country are significant determinants of India’s exports. Trade openness which is an indicator of globalisation is positive and highly significant indicating that trade openness of the partner country has resulted in increased Indian exports to that country. Of the two variables capturing the impact of RTAs, the variable defining the number of RTAs negotiated with trading partners is positive and significant. The results show that while presence of an RTA may have a positive impact on Indian exports, they are still not a prime consideration. At the same time, the width of integration is having a significant positive impact on India’s exports.

Keywords: Globalisation, Regional Trade Agreements, India, Exports, Trade Openness.

1.0 Introduction

The wave of globalisation has boosted interdependence among economies and facilitated trade and investment liberalisation. Coinciding with the era of globalisation, there has been a rise in the number and depth of Regional Trade Agreements (RTAs).

* Assistant Professor, Department of Commerce, Delhi School of Economics, University of Delhi.
** Assistant Professor, Department of Commerce, Hindu College, University of Delhi.
Under the umbrella of WTO, RTAs have been formed to reduce (and even remove) tariff and non-tariff barriers in order to promote trade among member nations. RTAs regulate more than one half of global trade, according to the Inter-American Development Bank. With the emergence of a large number of RTAs the entire world can be seen as a global market for trade. Asia has also witnessed a large number of successful RTAs moving towards a potential free trade region.

As India has also been a part of the globalisation and liberalisation wave, this paper examines whether globalisation and the resultant increase in RTAs have made an impact on its export position. In 2010, India was the 20th largest exporter in the world in merchandise trade, with a share of 1.4 per cent and the 13th largest importer with a share of 2.1 per cent in 2010 (International Trade Statistics, WTO). India’s export sector has exhibited remarkable resilience and dynamism in the recent years as merchandise exports recorded a Compound Annual Growth Rate (CAGR) of 20.0 per cent from 2004-05 to 2010-11 (Department of Commerce, Government of India).

1.1 Trends of RTAs in India
Since the onset of liberalisation in 1991, India has actively participated in the formation of RTAs. WTO database shows that 18 out of 20 RTAs of India have been negotiated only after 1990. Such trends indicate a positive move towards trade liberalisation. As of 31st January, 2014, for India, 8 Free Trade Agreements, 4 Economic Integration Agreements and 8 Partial Scope Agreements are negotiated and in force. India also has some of the significant RTAs such as ASEAN-India, APTA, SAPTA and others to its credit. Since 2005, India has negotiated agreements for trade in services along with trade in goods. This exhibits a willingness to strengthen trade in services with member countries.

1.2 Trends of Indian export
In 2012, India’s total export value to world has reached to US$ 289.5 billion which is 16 times more than the value of export in 1991 (i.e. US$ 17.9 billion). India has seen a consistent rise in the total export value since 1991, a positive indicator as well as outcome of trade liberalisation (Figure 1). As per ComTrade database, India’s export value for intra-Asian exports comes to US$149.7 billion which accounts for 50% of India’s total exports. This indicates Asia as a significant destination of Indian exports.
2.0 Rationale of the Study

Since 1990, Indian economy has made policy changes supportive of globalisation. In this direction, there has been an increase in the number of RTAs negotiated by India in the past two decades. We attempt to look into the impact of globalisation on Indian exports with special focus on RTAs which have become important tools of trade liberalisation across the continent. While a numbers of studies have examined the impact of regional economic integration on trade, our study tries to empirically examine the impact of globalisation on Indian exports along with the impact of RTAs with trading partners.

3.0 Literature Review

There are a number of studies covering the impact of RTAs on trade. However, the studies vary in terms of regional coverage, variables examined, time span, methodology applied and outcome derived. Most of the studies covering the impact of RTA on trade found positive and significant intra-regional trade creation. Studies conducted by Lee and Shin (2005), Guilhot (2010) Rahman, Shadat and Das (2006)
show positive coefficient for GDP, GDP per capita and adjacent variables but negative (and significant) coefficient for distance. The negative coefficient of distance depict an increase in transportation cost negatively effects trade. Studies conducted in the region of south Asia do not depict uniform result for the intra-SAARC bloc. Studies done by Rahman, Shadat and Das (2006) found positive sign for intra-trade creation for India, Pakistan and Bangladesh but negative coefficient for other countries. Similarly, Akhter and Ghani (2010) found trade diversion for both members and non-members for other countries in the trading bloc. Such results are reflected due to the structural limitations in the region. Studies conducted for major African RTAs (ECOWAS and SADC) show positive coefficient for trade creation but the results of trade creation are better for SADC as compared to ECOWAS (Peter et al, 2011). Another study conducted by Lee and Shin also found positive coefficient for trade creation but no trade diversion was seen. However, the study also states that ‘natural trading partners’ (countries which lead to reduction in transaction cost) create more trade and have less trade diversion. Study conducted by Guilhot (2010) covering three main East Asian trade agreements (ASEAN, ASEAN-Korea, ASEAN-China) found ASEAN trade agreement supporting both intra-regional and extra-regional trade but the other two trade agreements do not show positive coefficient for intra-regional trade. Muhammad and Aycil (2010) covering six RTAs in the Western Hemisphere found trade creation for all RTAs except NAFTA and LAIA. For LAIA, the study found negative impact on trade both for members and non-members.

The empirical studies covering trade and globalisation are less in number. A study conducted by Naghshpour and Sergi (2009) create a meaningful and sound index for globalisation. The study also talks about two significant measures used to capture globalisation for trade. The first one only covers the sum of export and import. The other measure covers sum of import and export as a percentage of GDP. Our study follows the second measure and therefore, trade openness (Export+Import)/GDP has been incorporated to capture globalisation. Other study by Anderson (2010) analytically finds the impact of globalisation on agricultural trade. The study measures globalisation as decline in costs of cross-border trade in farm and other products. The study also examines the other factors which have impact on the agricultural trade in Asia. Subasat(2008) found negative relation between trade openness and restrictions but the study found no clear evidence that the removal of trade restrictions always lead to improved trade openness.
4.0 Data source and Research Methodology

Our study employs panel data regression on an augmented gravity model. The basic gravity model was proposed by Tinbergen (1962) to explain international bilateral trade. Since then, gravity equations have frequently been used to describe and empirically explain variations in bilateral trade patterns. The popularity of the model is highlighted by Eichengleen & Irwin (1998, p.33) who referred to it as “the workhorse for empirical studies of RTA to the virtual exclusion of other approaches.” The model is called the ‘gravity model’ for its analogy with Newton’s law of universal gravitation. A large number of empirical studies applied gravity model to estimate the trade creation and diversion effects of RTAs. According to the basic model, flows of export between two countries are explained by their economic size (GDP or GNP), population and direct geographical distance between the countries. Thereafter, a certain number of dummy variables (like membership of RTA, sharing common land border and commonality of language, etc.) are added to test for specific effects (Rahman, Shadat, Das, 2006).

4.1 Data Sources

The data on bilateral export between trading partners was collected from International Trade Centre and UN comtrade database. GDP and GDP per capita for trading countries were taken from the World Bank database. With respect to other explanatory variables, data on trade openness was gathered from UNCTAD database and details of RTAs negotiated between India and trading partner were taken from WTO data on RTAs.

4.2 Sample Period

The study covers a period of 22 years from 1991 till 2012 to capture the era of globalisation. The trading partners selected for the study are China, Singapore, Hong Kong, Saudi Arabia, Japan, Bangladesh, Republic of Korea, Sri Lanka (which are India’s top exporting markets). One of the top most exporting partner United Arab Emirates was dropped due to non-availability of data for trade openness for the period 1991-1998. In 2012, these countries accounted for 50% of India’s export to Asia and ¼ of India’s total export to the world.

4.3 Model Specification

Majority of empirical work on gravity model of trade use bilateral export flows as dependent variable. Our work also follows the similar trend and therefore, bilateral
export flow has been taken as the dependent variable. The functional form for our gravity model capturing globalisation and RTAs is as follows:

\[ EX_{ijt} = f(GDP_{it}, GDP_{jt}, GDP_{pcit}, GDP_{pcjt}, DIST_{ijt}, RTA_{ijt}, No_{RTA_{ijt}}, TOPEN_{jt}) \]

We use a double log model for panel data regression to analyse the determinants of bilateral trade (in terms of export) between India and its trading partner.

\[ \text{Log}EX_{ijt} = \text{LogGDP}_{it} + \text{LogGDP}_{jt} + \text{LogGDP}_{pcit} + \text{LogGDP}_{pcjt} + \text{LogDIST}_{ijt} + \text{LogTOPEN}_{jt} + RTA_{ijt} + No_{RTA_{ijt}} \]

where \( \text{Log}EX_{ijt} \) represents log of export flow from India \( i \) to export trading partner (host) \( j \) for year \( t \),

\( \text{LogGDP}_{it} \), the log of GDP of country \( i \) (India) for a given year \( t \),

\( \text{LogGDP}_{jt} \), the log of GDP of country \( j \) (trading partner) for a given year \( t \),

\( \text{LogGDP}_{pcit} \), the log of GDP per capita of country \( i \) for given year \( t \),

\( \text{LogGDP}_{pcjt} \), the log of GDP per capita of country \( j \) for given year \( t \),

\( \text{LogDIST}_{ij} \), the log of distance between the two countries \( i \) and \( j \) for given year \( t \),

\( \text{LogTOPEN}_{ij} \), the log of trade openness of host country/trading partner \( j \) for a given year \( t \).

\( RTA_{ij} \), dummy variable is 1 if both the countries \( i \) and \( j \) are part of same regional agreements for given year \( t \) otherwise 0,

\( No_{RTA_{ij}} \), dummy variable indicating the number of RTA to which the trading partners are in the year \( t \),

**Independent variables**

*Gross domestic product (GDP)* has been incorporated to explain the economic size of both the trading countries. The GDP of the exporting country measures productive capacity (supply), while that of the importing country measures absorptive capacity (demand). Income (GDP) is one of the traditional enhancement variables in bilateral trade. GDP of both the trading partners are expected to have a positive coefficient because of direct relationship between Export and GDP.

*GDP per capita (GDP pc)* estimates the impact of economic development on trade flows. As an economy develops, people tend to have more demand for different types of products. We expect a positive coefficient for GDP per capita. The variable GDP captures the importance of size of the total economy as a determinant of trade, whereas the variable GDP per capita incorporates the effects of wealth of the economy on trade (the purchasing power).
Distance (DIST) captures the impact on exports with increase or decrease in transportation cost. Trade will decrease with the increase in the distance between the two trading countries. The increase in the distance between India and the exporting country will raise the transportation and information cost that would cause a reduction in trade between the trading partner. Higher transportation cost would make goods expensive and ultimately reduce the trade level. The variable is expected to have a negative impact on exports.

Trade Openness (TOPEN) refers to the degree to which countries or economies permit or have trade with other countries or economies. Trade openness captures the strength in the domestic policies which promote trade among trading partners. In our study, trade openness is the indicator of trade component of globalisation. As is the practice in literature, trade openness is calculated as the sum of exports plus total imports over GDP. We expect that bilateral trade between India and the trading partner will increase with the increase in trade openness.

To capture the impact of RTAs on India’s exports, we have taken two types of variables related to RTA. The first variable, RTA incorporates the existence of a RTA between India and its trade partner for a particular year. The value of the variable is 1 if both countries i and j are part of the same agreement in a particular year and 0 in case if there is no common RTA negotiated between India and its trade partner. The second variable, number of RTA (No_RTA), measures the number of RTAs that India has with a particular trading partner. A larger number of RTAs negotiated with the trading partner indicate a conducive environment for trade between the both countries. We can use this variable to measure width and strength of integration to promote trade over time. We expect the effect of both these variables to be positive.

A summary of the explanatory variables along with expected signs is provided in Appendix table A.

4.4 Research Methodology

Fixed effects Vs Random effects

Studies covering panel data regression model have intensively used either fixed effects or random effects specifications. A fixed effects (FE) model specification is incorporated in the studies where the individual and/or time specific effects are correlated with the explanatory variable. Moreover, each cross-sectional entity is recognised with some specific attributes of its own. However, FE specification cannot be used as a better estimator in case the individual specific effects are not correlated with the explanatory variable. Another, significant limitation of FE model is that it cannot be used to generate reliable results in case the individuals or entities do not vary or vary
insignificantly across time. Therefore, studies covering both time variant and invariant variables simultaneously have applied only random effect specifications as RE specifications are well equipped to efficiently capture both these variables. In our study the geographical variables like distance and common border are fixed across countries therefore only random effects regression model can be explained.

Fixed effects will not fit well with data where within individual variations are less. In other words, fixed effects completely over passes the between individual variations and emphasises only on within-individual variations. However, random effects captures both within and between individual variations. The general least square method (GLS) is used to estimate random effects model. GLS is a weighted average of both between and within effects and explains the origin from where the variations are coming whether within the individuals or between the individuals.

**Multicollinearity**

With the given set of variables, results for regression model were generated. Although R-square was quite large, most of the variables had insignificant p-value, indicating presence of multi-collinearity. As show in Appendix Table B regressors GDPi and GDPpci (GDP and GDP per capita for India) were highly correlated. Therefore, we dropped one of these variables, i.e., GDP pci and the reduced model was as follows:

\[
\text{LogEXijt}=\text{LogGDPit}+\text{LogGDPjt}+\text{LogGDPpcjt}+\text{LogDISijt}+\text{LogTOPENjt}+\text{RTAijt}+\text{No}_\text{RTAijt}
\]

**6.0 Results and Analysis**

Table 1 presents the results generated for the reduced log model using random-GLS model for a period of 22 years 1991-2012. The gravity model fits in well capturing the determinants for Indian exports with R² of 91%. Most of the variables of the gravity model are found to be statistically significant and have expected signs. The coefficient for GDP of India is significant and positive implying that with increase in GDP, India is able to offer better products and fetch a market for India’s trade. Similarly, GDP and GDP per capita of the trading countries are statistically significant at 1% and carry expected signs. This indicates that India’s bilateral trade is positively affected by the economic size and purchasing power of the trading partner. A trading partner with larger GDP and GDP per capita will have a more diversified demand and better products to offer thereby positively affecting Indian trade. Therefore, countries like China, Singapore, Japan, Saudi Arabia having high GDP are top trade partners of India. The variable trade openness of the trading partner is found to be highly significant and
positive which suggest that India is benefitting from the globalisation wave and the consequent trade liberalisation. The variable distance is also found to be negative and significant. Hence an increase in transportation cost leads to a decrease in India’s export.

The study depicts that both the variables capturing the impact of regional trade agreement are positive. However, the variable RTA is found to be insignificant. As major multilateral RTAs for India are negotiated only after 1995 except APTA (with was negotiated in 1976) and significant bilateral RTAs were negotiated only after 2000, therefore it is possible that the impact of some of India’s RTAs are still not reflected. This is because we expect that it would take some time for the RTA to start having an impact on trade, after notification. However, the variable NRTA capturing the number of RTAs negotiated with the trading partner is found to be positive and significant. The study indicates that in case the trading partner negotiates larger number of RTAs with India, then it leads to a significant positive impact on India’s export. This implies that an increase in the number of RTAs with the trading partners adds to the strength and width of India’s relation with its exporting partners thereby improving exports.

Table 2: Estimates of Gravity model with panel GLS for LogEXPijt as dependent variable (capturing cross sectional random effects)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Stat</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.860499</td>
<td>1.851689</td>
<td>1.004758</td>
<td>0.3163</td>
</tr>
<tr>
<td>LogGDPi</td>
<td>0.444043*</td>
<td>0.087554</td>
<td>5.071661</td>
<td>0.0000</td>
</tr>
<tr>
<td>LogGDPj</td>
<td>0.870501*</td>
<td>0.122493</td>
<td>7.106516</td>
<td>0.0000</td>
</tr>
<tr>
<td>LogPCj</td>
<td>0.346115*</td>
<td>0.112128</td>
<td>3.086787</td>
<td>0.0023</td>
</tr>
<tr>
<td>LogTROPj</td>
<td>0.579766*</td>
<td>0.123573</td>
<td>4.691676</td>
<td>0.0000</td>
</tr>
<tr>
<td>RTAijt</td>
<td>0.034309</td>
<td>0.038392</td>
<td>0.893659</td>
<td>0.3726</td>
</tr>
<tr>
<td>NRTAijt</td>
<td>0.048245*</td>
<td>0.017696</td>
<td>2.726388</td>
<td>0.0070</td>
</tr>
<tr>
<td>LogDISij</td>
<td>-2.920974*</td>
<td>0.494868</td>
<td>-5.902530</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-square</td>
<td>0.926716</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>0.924016</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* indicates statistical significance at 1 percent level.

Presently, India has two RTAs with Japan and four with Singapore and Korea covering both goods and services. Even neighboring countries like Bangladesh and Sri Lanka are becoming active partners of India in negotiating RTAs. Hence, India’s participation in RTAs is growing and this is depicting a positive impact on India’s trade. We find that the India’s exports are significantly affected by basic factors such as demand, purchasing power and distance. At the same time, a liberalised trade
environment (in terms of trade openness) and a greater number of RTAs are adding strength and width to India’s exports.

7.0 Conclusion and implications of the Study.

This paper uses an augmented gravity model that explains about 92\% of variation in India’s exports. As we wanted to capture both time variant as well as invariant variables, therefore, a random effect specification using GLS was used to capture the impact of variables on India’s export. We found that GDP and GDP per capita of the trade partner as significant determinants of India’s export. This implies that India’s export responds positively and significantly to the economic size and development of trade partner. Distance is an important factor in determining India’s trade and an increase in distance leads to increase in transportation cost. GDP of India is also found to be significant to India’s export indicating that better GDP provides a better supplying capacity to India in the international market. Trade openness of trading partner is found to be highly significant implying India is able to fetch a better market for its product in the era of globalisation. As India is liberalising its trade by increasing the width and strength of integration with trading partners, a larger number of RTAs is significantly affecting India’s trade. However, just the presence of RTA with the trading partner acts as a facilitator but is not a major determinant of Indian exports.

The study indicates that India is able trade more by not only trading with economies which are more liberal but also have better economic development and purchasing power. However, the presence of an RTA might become significant with the passage of time as large numbers of RTAs negotiated by India are presently not too old. The variable, number of RTAs is adding strength and width to India’s export. Countries like Japan, Korea, Singapore, Bangladesh, Sri Lanka and others which are having more than one RTAs negotiated with India are part of top 10 exporting partners of India.

References


### Appendix Table A: Explanatory Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Form of variable</th>
<th>Expected sign</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPi</td>
<td>GDP of India, the exporting country</td>
<td>Log of GDPj</td>
<td>positive</td>
<td>Indicates the productive capacity or supply of exporting country.</td>
</tr>
<tr>
<td>GDPj</td>
<td>GDP of the trade partner</td>
<td>Log of GDPj</td>
<td>positive</td>
<td>Indicates the absorption power or demand of importing country.</td>
</tr>
<tr>
<td>GDPpci</td>
<td>GDP per capita of India</td>
<td>Log of GDP per capita</td>
<td>positive</td>
<td>Indicates the level of economic development.</td>
</tr>
<tr>
<td>GDPpcj</td>
<td>GDP per capita of trade partner</td>
<td>Log of GDP per capita of trade partner</td>
<td>positive</td>
<td>Indicates the purchasing power of the importing country.</td>
</tr>
<tr>
<td>DISTij</td>
<td>Distance between the capital cities of India and trade partner</td>
<td>Log of distance between the two countries</td>
<td>Negative</td>
<td>Indicates increase in the transportation cost with increase in distance.</td>
</tr>
<tr>
<td>TOPENj</td>
<td>Trade openness for importing trade partner. The variable is measured as (export+import)/real GDP.</td>
<td>Log of trade openness</td>
<td>Positive</td>
<td>Indicates degree to which countries permit trade.</td>
</tr>
<tr>
<td>RTAij</td>
<td>Whether a common Regional trade agreement exists between both India and its trade partner in a particular year.</td>
<td>A dummy variable, takes value 1 incase both the trading partners have a common RTA</td>
<td>Positive</td>
<td>Indicate of reduction or removal of trade barriers in order to boost trade.</td>
</tr>
<tr>
<td>No_RTAij</td>
<td>Number of RTAs between the trade partners in a particular year.</td>
<td>A dummy variable indicating the number of RTAs between the trade partners.</td>
<td>Positive</td>
<td>Indicates the strength and width of relationship.</td>
</tr>
</tbody>
</table>
Appendix Table B: Correlation among Explanatory Variables

<table>
<thead>
<tr>
<th></th>
<th>log(GDP_Pi)</th>
<th>log(GDP_PCI)</th>
<th>log(GDP_Pi)</th>
<th>log(GDP_PCI)</th>
<th>log(DIS_ij)</th>
<th>log(trade_openj)</th>
<th>RTA_ijt</th>
<th>No_RTA_ijt</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(GDP_Pi)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(GDP_PCI)</td>
<td>0.9988</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(GDP_Pi)</td>
<td>0.2806</td>
<td>0.2803</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(GDP_PCI)</td>
<td>0.2298</td>
<td>0.2301</td>
<td>0.4728</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(DIS_ij)</td>
<td>-2.07E-17</td>
<td>1.2289E-17</td>
<td>0.6726</td>
<td>0.6123</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(trade_openj)</td>
<td>0.1574</td>
<td>0.15518</td>
<td>-0.3369</td>
<td>0.4509</td>
<td>0.069</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTA_ijt</td>
<td>0.1587</td>
<td>0.15830</td>
<td>-0.2992</td>
<td>-0.3901</td>
<td>-0.185</td>
<td>-0.0068</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>No_RTA_ijt</td>
<td>0.3161</td>
<td>0.3172</td>
<td>-0.4727</td>
<td>-0.3928</td>
<td>-0.502</td>
<td>-0.0317</td>
<td>0.726</td>
<td>1</td>
</tr>
</tbody>
</table>