CHAPTER-4-METHODOLOGY

This study focuses on trade between India and European Union and the analytical tools used for the study are:

1. Revealed Comparative Advantage of exports and imports by India to European Union member, and
   a. Percentage trade of India with European Union members compared to India’s total trade with EU-25,
   b. Study of top ten exports/imports by India to/from European Union members in five year gaps from 1980-2005,
   c. Percentage of intra-EU trade done by European Union members in products in which value of RCA is greater than 1 in India’s trade with European Union.
2. Intensity of Trade Index for exports, imports and total trade between India and European Union members.

Revealed Comparative Advantage

The concept of Revealed Comparative Advantage (RCA) pertains to the relative trade performance of individual countries in particular commodities. The commodity pattern of trade reflects the inter-

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country differences in relative costs as well as in non-price factors. The prime factors that contribute to movements in RCA are economic, structural change, improved world demand and trade specialization. The advantage of using the Comparative Advantage index is that it considers the intrinsic advantage of a particular commodity and is consistent with changes in an economy’s relative factor endowment and productivity. RCA shows which goods countries tend to specialize in their trade. According to the Heckscher-Ohlin theorem\textsuperscript{130} a given country’s Comparative Advantage (or disadvantage) is determined by its factor endowments. A country has a Comparative Advantage in those sectors that intensively use the productive factors that are abundant in the country and cross-country trade patterns are determined by differences in Comparative Advantage. A country will export goods whose production intensively uses the factors that are relatively abundant (and thus comparatively cheap) in that country and import those goods whose production would require the use of relatively scarce (expensive) factors.

The Revealed Comparative Advantage for exports RCAX is calculated as below:

\[
\text{RCAX} = \frac{x_{ik} / X_{ij}}{x_{jk} / X_j}
\]

Where:

- \(x_{ik}\) is the export of product \(k\) by country \(i\) (India) to another Region/Country \(j\);
- \(X_{ij}\) is the total exports of country \(i\) (India) to the reference group \(j\);
- \(x_{jk}\) is the exports of product \(k\) by the reference group \(j\);
- \(X_j\) is the total exports of reference group \(j\).


Note: Intra Industry Trade has been calculated, but results are not relevant to the focus area of this study.
The Revealed Comparative Advantage for imports RCAM is calculated as below:

\[
RCAM = \frac{m_{ijk}}{M_y} \frac{m_{jk}}{M_j}
\]

Where:
\(m_{ij}^k\) is the import of product \(k\) by country \(i\) (India) from another Region / Country \(j\); \(M_y\) is the total imports of country \(i\) (India) from the reference group \(j\); \(m_{jk}^i\) is the imports of product \(k\) by the reference group \(j\); and \(M_j\) is the total imports of reference group \(j\).

The index of Revealed Comparative Advantage has a simple interpretation. Value greater than 1 for the RCAX / RCAM indicates a comparative advantage while value less than 1 for the RCAX/RCAM indicates comparative disadvantage for the economy in the export /import of a given product.

**RCA & Other Related Analysis**

RCA is first calculated with every member of the European Union for the period 1980-2005 in each product both for exports from India to the European Union member and for imports by India from the European Union member. Product list is as per 2-digit Standard International Trade Classification (SITC), revision 2. There are 67 different product categories under this classification. Thereafter, those products are chosen which have value of RCA greater than 1.

The products with value of RCA greater than 1 are classified broadly as per the following RCA characteristics:

1. Products having sustainable RCA over the study period.
2. Products which had RCA before liberalisation in India but could not keep RCA meaningfully after liberalisation.

3. Products which were not having meaningful RCA before liberalisation in India, but developed RCA post liberalisation.

4. Upcoming products, i.e. products, which were not having any RCA previously, but have started having RCA recently since the year 2000 or later.

5. Products with RCA showing increasing or decreasing trend (erratic trend) over the study period.

For recommendation of the products on basis of RCA, only those products which also had RCA in the year 2005 are recommended.

Further, India’s trade data with European Union from 1980-2005 is studied to find:

(i) India’s trade with European Union member as percentage of India’s total trade with EU-25:

From this table we find significance of European Union member in India’s trade with EU-25 as a whole.

(ii) The top 10 products exported/imported by India to/from European Union in five year gaps from 1980 to 2005:

From these tables we find change in product composition over past 15 years (covering pre and post liberalisation period of India) by comparing top 10 products in 1990 and in 2005.

(The choice of top 10 products is made because bulk of India’s trade with nearly all of the European Union members, is represented in the top 10 products traded with the respective member.)\(^{131}\)

\(^{131}\) Source: UNCTAD Data base
(iii) The percentage of export and import trade done by a European Union member with EU-25 itself:

From these tables we find the percentage trade done by the European Union member with EU-25 itself in products in which India has value of RCA greater than 1, and we also find the percentage of total trade done by the members with EU-25 itself.

**Intensity of Trade Index**

Intensity of Trade indices essentially seek to establish the relative importance of a trading partner in relation to a country’s trade with rest of the world. The Intensity of Trade index is interpreted as a relative measure of two ratios. The numerator represents the share of bilateral trade (total trade or total exports or total imports, as applicable) between country i and country j as a percentage of total trade of country i (for exports intensity of trade index instead of total trade of country i, it is total exports of country i and for imports intensity of trade index instead of total trade of country i, it is total imports of country i). The second ratio in the denominator represents the total trade of country j with the world excluding total trade of country i (for exports intensity of trade index instead of total trade of country j, it is total imports of country j from world less of imports of

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country j from country i; and for imports intensity of trade index instead of total trade, it is total exports of country j less of exports from country j to country i) as a share of total world trade excluding total trade of country i (for exports intensity of trade index instead of total world trade, it is total imports of world less of total imports of country i and for imports intensity of trade index instead of total world trade, it is total exports of world less of total exports of country i).

The calculation for the Intensity of Trade Index for total trade is as follows:

\[
T_{ij} = \frac{[(X_{ij} + M_{ij}) / (X_i + M_i)]}{[(X_{wj} + M_{wj}) - (X_{ij} + M_{ij}) / (X_w + M_w) - (X_i + M_i)]}
\]

Where:

\(T_{ij}\) is the total trade intensity index of country i with country j; \(X_{ij}\) is the exports of country i to country j; \(M_{ij}\) is the imports of country i from country j; \(X_i\) is the total exports of country i; \(M_i\) is the total imports of country i; \(X_{wj}\) is the total world exports to country j; \(M_{wj}\) is the total world imports from country j; \(X_w\) is the total world exports; and \(M_w\) is the total world imports.

The calculation for the Intensity of Trade Index for Exports is as follows:

\[
X^*_{ij} = \frac{[X_{ij} / X_i]}{[(M_j - M_{ji}) / (M_w - M_i)]}
\]

Where:

\(X^*_{ij}\) is the export trade intensity index of country i with country j; \(X_{ij}\) is the exports of country i to country j; \(X_i\) is the total exports of country i; \(M_j\) is the total imports of country j; \(M_{ji}\) is the imports of country j from country i; and \(M_i\) is the total imports of country i.
country \( i \); \( M_w \) is the total world imports; and \( M_i \) is the total imports of country \( i \).

The calculation for the Intensity of Trade Index for Imports is as follows:

\[
M_{ij} = \frac{M_{ij}}{M_i} \cdot \frac{X_j - X_{ji}}{X_w - X_i}
\]

Where:

- \( M_{ij} \) is the import trade intensity index of country \( i \) with country \( j \);
- \( M_{ij} \) is the imports of country \( i \) from country \( j \);
- \( M_i \) is the total imports of country \( i \);
- \( X_j \) is the total exports of country \( j \);
- \( X_{ji} \) is the exports of country \( j \) to country \( i \);
- \( X_w \) is the total world exports; and
- \( X_i \) is the total exports of country \( i \).

A value of greater than 1 for intensity of trade index implies that country \( i \)'s relative share of trade with country \( j \) exceeds country \( j \)'s share of trade with rest of the world. This would imply an overrepresentation of country \( j \) in country \( i \)'s market. From country \( i \)'s point of view, the value of greater than 1 indicates that country \( i \) has relatively more intense preference for trading with country \( j \) as compared to country \( j \)'s trade with rest of the world.

**Source of Data**

Data for Revealed Comparative Advantage, Intensity of Trade Index, percentage of India’s trade with a European Union member in comparison to India’s total trade with EU-25, top ten products exported/imported by India to/from European Union, and for percentage of intra-EU trade has been taken out from 2 digit Standard International Trade Classification (SITC) level,
revision 2, UNCTAD\textsuperscript{133} data base. This data has been extracted through the World Integrated Trade Solution (WITS) system which gets data reported by United Nations and WTO and the data is from COMTRADE maintained by UN Statistical Division.

\begin{itemize}
  \item Data of India's trade with its trade partners has been taken from website of Ministry of Commerce (www.commerce.nic.in).
  \item The general data of individual country of EU members has been taken from World Development Indicator CD-ROM for 2006, World Bank; and the website on European Union- http://ec.europa.eu/eurostat.
\end{itemize}

\textsuperscript{133} Note: For Imports by India, data is not available for 1982.