India's International Trade of Cells and batteries; primary, lithium (ITCHS 850650)

Section 1: Introduction

The study uses trade indicators to analyze merchandise export and import data in a way that should be useful for the purpose of formulation of policy. The indicators provide a glimpse of the trade patterns of the world and the performance of India in comparison to various other countries. They have been used in the case of India's exports of Lithium Batteries (ITCHS 850650), to indicate the possible directions policy may take.

Computations are primarily based on data at the ITC-HS two-digit level (HS-85) and ITC-HS six-digit level (HS-850650) and the latest finalized data available on the UN Comtrade Database up to year 2019.

Table 1: ITCHS Classification of Lithium (batteries)

ITC HS Code	Name/Description
8506	Primary cells and primary batteries
850650	Cells and batteries; primary, lithium

Section 2: Trends in International Trade i.e. Exports and Imports of Cells and batteries; primary, lithium

A glimpse of the top twenty exporters of Lithium Primary Cells and Batteries, in the world is given in table 2 below.

Table 2: Exports of Cells and batteries; primary, lithium (ITCHS -850650) in million US $

Country	2015	2016	2017	2018	2019
China, Hong Kong SAR	16.22	19.88	26.11	19.84	9.85
China	5.33	5.68	11.09	15.61	11.12
Rep. of Korea	8.78	8.86	5.67	5.45	10.49
Singapore	4.59	4.31	4.68	5.12	3.42
USA	1.04	4.29	3.89	3.29	1.27
Indonesia	1.18	1.55	3.11	5.54	1.58
Israel	0.29	0.44	0.61	1.23	0.23
Russian Federation	0.00	0.21	0.48	1.03	1.03
France	0.28	0.50	0.59	0.61	0.67
Germany	0.21	0.27	0.35	0.57	0.43
United Kingdom	0.27	0.31	0.23	0.35	0.52
Japan	0.20	0.26	0.36	0.32	0.35
United Arab Emirates	0.10	0.05	0.39	0.54	0.22
Canada	0.40	0.28	0.17	0.08	0.03
Italy	0.09	0.33	0.12	0.25	0.13
Thailand	0.00	0.00	0.00	0.00	0.62
Malaysia	0.14	0.30	0.01	0.01	0.00
Switzerland	0.14	0.13	0.02	0.05	0.09
Netherlands	0.04	0.02	0.04	0.04	0.10
Belgium	0.04	0.06	0.04	0.04	0.02
Others	0.16	0.10	0.20	0.24	0.14
Total Export Value	**39.49**	**47.84**	**58.14**	**60.20**	**42.31**

Source: Computed from UN Comtrade database

Tables 2 and 3 show the top twenty exporters of Lithium Primary Cells and Batteries and their percentage shares. Hongkong, China, South Korea, Singapore and USA are the top five exporters of Lithium Primary Cells and Batteries from 2015 to 2019. Together, these five countries covered more than 75% per cent of export value in 2019.

Table 3: Shares of countries in % in world exports of Cells and batteries; primary, lithium (ITCHS - 850650)

Country	2015	2016	2017	2018	2019
China, Hong Kong SAR	41.06	41.55	44.91	32.96	23.28
China	13.49	11.88	19.08	25.92	26.27
Rep. of Korea	22.22	18.52	9.75	9.05	24.80
Singapore	11.62	9.00	8.04	8.50	8.09
USA	2.64	8.97	6.69	5.47	3.01
Indonesia	2.98	3.24	5.34	9.21	3.74
Israel	0.73	0.93	1.05	2.05	0.54
Russian Federation	0.01	0.44	0.82	1.72	2.44
France	0.71	1.04	1.01	1.01	1.58
Germany	0.53	0.56	0.60	0.94	1.01
United Kingdom	0.68	0.66	0.39	0.59	1.22
Japan	0.51	0.55	0.62	0.53	0.83
United Arab Emirates	0.25	0.10	0.67	0.89	0.52
Canada	1.01	0.58	0.29	0.13	0.06
Italy	0.23	0.69	0.20	0.41	0.30
Thailand	0.00	0.00	0.00	0.00	1.46
Malaysia	0.35	0.64	0.01	0.02	0.00
Switzerland	0.36	0.27	0.04	0.08	0.21
Netherlands	0.11	0.05	0.07	0.07	0.23
Belgium	0.11	0.13	0.07	0.06	0.06
Others	0.39	0.22	0.34	0.40	0.33
Total	**100**	**100**	**100**	**100**	**100**

Source: Computed from UN Comtrade database

Tables 4 and 5 show the top twenty importers of Lithium Primary Cells and Batteries in the world and their percentage shares. Mexico, USA, Israel, Singapore and China are the top five importers of Lithium Primary Cells and Batteries from 2015 to 2019. Together, these five countries around 45% per cent of import value in 2019.

Table 4: Imports of Cells and batteries; primary, lithium (ITCHS -850650) in million US dollars

Country	2015	2016	2017	2018	2019
Mexico	0.72	0.70	0.31	0.28	0.14
USA	0.07	0.54	0.40	0.12	0.12
Israel	0.36	0.60	0.13	0.00	0.00
Singapore	0.46	0.28	0.13	0.05	0.08
China	0.05	0.22	0.08	0.06	0.16
Serbia	0.00	0.00	0.00	0.25	0.24

Country					
Botswana	0.00	0.32	0.00	0.00	0.00
China, Hong Kong SAR	0.07	0.04	0.00	0.06	0.05
United Kingdom	0.02	0.10	0.04	0.00	0.01
Czechia	0.04	0.11	0.00	0.02	0.00
Switzerland	0.05	0.02	0.02	0.02	0.06
Philippines	0.10	0.00	0.06	0.00	0.00
Russian Federation	0.00	0.00	0.08	0.07	0.00
France	0.03	0.05	0.01	0.01	0.02
Germany	0.00	0.04	0.01	0.02	0.01
Poland	0.00	0.00	0.06	0.02	0.00
Slovakia	0.03	0.02	0.02	0.00	0.00
United Arab Emirates	0.01	0.00	0.00	0.00	0.04
Thailand	0.00	0.00	0.01	0.04	0.00
Nigeria	0.03	0.00	0.00	0.01	0.00
Others	0.12	0.10	0.12	0.13	0.19
Total Import Value	**2.15**	**3.13**	**1.48**	**1.16**	**1.14**

Source: Computed from UN Comtrade database

Table 5: Shares of countries in % in world imports of Cells and batteries; primary, lithium (ITCHS - 850650)

Country	2015	2016	2017	2018	2019
Mexico	33.42	22.44	21.13	23.77	11.85
USA	3.19	17.11	26.95	9.99	10.92
Israel	16.59	19.11	8.69	0.17	0.26
Singapore	21.55	9.05	9.01	4.49	6.99
China	2.50	6.92	5.41	5.44	13.78
Serbia	0.01	0.04	0.11	21.29	21.33
Botswana	0.00	10.17	0.00	0.00	0.00
China, Hong Kong SAR	3.07	1.15	0.00	5.54	3.97
United Kingdom	0.99	3.23	2.36	0.00	1.23
Czechia	1.84	3.42	0.11	1.30	0.17
Switzerland	2.29	0.53	1.04	1.54	5.47
Philippines	4.49	0.04	4.09	0.07	0.11
Russian Federation	0.03	0.02	5.22	5.93	0.01
France	1.23	1.64	0.87	0.96	1.62
Germany	0.03	1.28	0.41	2.10	1.15
Poland	0.05	0.03	3.99	1.59	0.17
Slovakia	1.20	0.52	1.34	0.00	0.00
United Arab Emirates	0.43	0.02	0.08	0.00	3.73

Thailand	0.01	0.01	0.51	3.67	0.13
Nigeria	1.56	0.03	0.32	0.82	0.03
Others	5.52	3.23	8.36	11.31	17.07
Total	**100**	**100**	**100**	**100**	**100**

Tables 6 and 7 below show the top twenty destinations for Indian exports of Lithium Primary Cells and Batteries, denoting the values and percentage shares respectively. UAE, USA, Israel, Hongkong and Malaysia are the countries which constituted the largest markets for India's exports of commodity class ITC-HS 850650 from 2015-2019 with export-value share of 57% in 2019.

Table 6: India's exports of Cells and batteries; primary, lithium (ITCHS -850650) to various countries (in million US dollars)

Partner Country	2015	2016	2017	2018	2019
United Arab Emirates	0.60	0.03	0.87	0.00	0.03
USA	0.94	0.00	0.78	0.00	0.01
Israel	0.46	0.31	0.10	0.32	0.00
China, Hong Kong SAR	0.43	0.04	0.00	0.41	0.08
Malaysia	0.02	0.00	0.00	0.00	0.91
Serbia	0.00	0.00	0.00	0.36	0.19
Singapore	0.19	0.05	0.02	0.05	0.01
Turkey	0.09	0.21	0.00	0.00	0.00
United Kingdom	0.04	0.00	0.08	0.10	0.07
France	0.00	0.06	0.00	0.00	0.23
China	0.04	0.04	0.00	0.01	0.12
Germany	0.00	0.00	0.07	0.00	0.03
Rep. of Korea	0.00	0.00	0.00	0.00	0.05
Qatar	0.01	0.00	0.00	0.02	0.01
Kuwait	0.01	0.01	0.00	0.01	0.00
Oman	0.00	0.01	0.00	0.00	0.01
Uganda	0.00	0.02	0.00	0.00	0.00
Ethiopia	0.00	0.00	0.00	0.01	0.01
Pakistan	0.00	0.00	0.00	0.00	0.02
Nepal	0.00	0.00	0.00	0.01	0.00
Others	0.00	0.00	0.01	0.04	0.03
Total Export Value	**2.82**	**0.77**	**1.93**	**1.35**	**1.80**

Table 7: Various countries' share (in %) in Indian exports of Cells and batteries; primary, lithium (ITCHS -850650)

Partner Country	2015	2016	2017	2018	2019
United Arab Emirates	21.41	3.62	44.86	0.00	1.48
USA	33.46	0.14	40.42	0.03	0.77
Israel	16.24	40.49	4.96	23.63	0.19
China, Hong Kong SAR	15.08	4.59	0.01	30.62	4.68
Malaysia	0.57	0.00	0.00	0.00	50.35
Serbia	0.00	0.03	0.00	26.56	10.31
Singapore	6.80	6.02	1.25	4.04	0.47
Turkey	3.05	27.67	0.00	0.00	0.00
United Kingdom	1.30	0.03	4.03	7.75	3.80
France	0.00	7.23	0.01	0.00	12.47
China	1.40	5.70	0.14	0.97	6.60
Germany	0.00	0.00	3.64	0.10	1.59
Rep. of Korea	0.00	0.00	0.10	0.00	2.87
Qatar	0.36	0.00	0.00	1.19	0.65
Kuwait	0.23	0.66	0.07	0.90	0.00
Oman	0.00	0.84	0.04	0.00	0.80
Uganda	0.00	2.57	0.00	0.01	0.00
Ethiopia	0.00	0.00	0.00	0.63	0.32
Pakistan	0.00	0.00	0.00	0.00	0.93
Nepal	0.00	0.21	0.00	0.80	0.05
Others	0.10	0.20	0.46	2.76	1.67
Total	**100**	**100**	**100**	**100**	**100**

Source: Computed from UN Comtrade database

Similarly, tables 8 and 9 show the top twenty destinations for Indian imports Lithium Primary Cells and Batteries, denoting the values and percentage shares respectively. China, Hongkong, South Korea, Indonesia and Israel are the countries from which India imported Lithium Primary Cells and Batteries, in descending order of magnitude of import-values, from 2015-2019 with total import-value share of 73% in 2019.

Table 8: India's imports of Cells and batteries; primary, lithium (ITCHS -850650) from various countries (in million US dollars)

Partner Country	2015	2016	2017	2018	2019
China	26.63	36.38	138.24	27.88	4.00
China, Hong Kong SAR	3.56	2.09	2.34	8.81	7.88
Rep. of Korea	8.38	6.63	4.78	2.57	0.90
Indonesia	2.28	2.93	2.87	2.60	1.64
Israel	2.10	3.15	2.83	1.00	0.50
Viet Nam	1.20	3.94	2.44	0.01	0.06

Singapore	0.60	0.44	0.60	2.11	2.26
USA	1.26	1.20	0.74	0.73	1.12
Germany	1.02	1.06	0.61	0.34	0.32
Japan	0.52	0.42	0.99	0.47	0.62
United Kingdom	0.46	0.36	0.22	0.28	0.21
France	0.14	0.07	0.34	0.35	0.12
Spain	0.51	0.00	0.05	0.00	0.00
Malaysia	0.29	0.03	0.15	0.00	0.02
Austria	0.11	0.09	0.00	0.14	0.15
Italy	0.06	0.05	0.19	0.14	0.05
United Arab Emirates	0.01	0.00	0.03	0.21	0.22
Thailand	0.17	0.06	0.18	0.03	0.01
Other Asia, nes	0.03	0.04	0.05	0.16	0.13
Canada	0.18	0.04	0.05	0.05	0.03
Others	0.16	0.56	0.18	0.52	0.23
Total Import Value	**49.68**	**59.53**	**157.88**	**48.41**	**20.47**

Source: Computed from UN Comtrade database

Table 9: Various countries' share in % in Indian imports of Cells and batteries; primary, lithium (ITCHS -850650)

Partner Country	2015	2016	2017	2018	2019
China	53.60	61.12	87.56	57.60	19.53
China, Hong Kong SAR	7.17	3.50	1.48	18.19	38.50
Rep. of Korea	16.87	11.13	3.03	5.30	4.41
Indonesia	4.58	4.93	1.82	5.38	8.02
Israel	4.22	5.29	1.79	2.07	2.45
Viet Nam	2.42	6.62	1.54	0.02	0.29
Singapore	1.22	0.74	0.38	4.36	11.05
USA	2.54	2.01	0.47	1.51	5.49
Germany	2.06	1.78	0.39	0.69	1.58
Japan	1.04	0.71	0.63	0.96	3.01
United Kingdom	0.93	0.60	0.14	0.58	1.02
France	0.29	0.11	0.21	0.71	0.60
Spain	1.03	0.00	0.03	0.00	0.00
Malaysia	0.59	0.05	0.09	0.01	0.11
Austria	0.23	0.14	0.00	0.30	0.73
Italy	0.11	0.09	0.12	0.30	0.22
United Arab Emirates	0.01	0.00	0.02	0.44	1.07
Thailand	0.34	0.10	0.11	0.07	0.03
Other Asia, nes	0.05	0.07	0.03	0.33	0.65

Canada	0.37	0.07	0.03	0.10	0.14
Others	0.33	0.94	0.11	1.07	1.10
Total	**100**	**100**	**100**	**100**	**100**

Source: Computed from UN Comtrade database

Section 3: Export Intensity Index

Export Trade Intensity Index (ETII) of a country with respect to an importing country is the share of the exporting country's merchandise going to that particular importing country divided by the share of world exports going to that importing country. In other words, it is the importance of that importing country as a destination for the exporting country's merchandise outflow, as compared to the importance that importing country enjoys as a destination of world exports. But algebraically, it is equal to the exporting country's share in the importer's market as compared to the same country's market share in the world market. Table 10 below shows the indices of some countries with respect to India for ITC-HS Chapter 85, Electrical, electronic equipment, to which Lithium Primary Cells and Batteries belong.

Table 10: Export Trade Intensity Indices for Electrical, electronic equipment (ITC-HS Chapter 85) of Countries w.r.t. India

Countries	2015	2016	2017	2018	2019
United Arab Emirates	5.79	8.78	6.21	10.77	16.08
USA	1.19	1.19	1.19	1.14	1.25
Netherlands	1.23	1.11	1.04	0.84	0.92
Russian Federation	0.73	1.24	0.66	1.74	3.77
China	0.16	0.24	0.26	0.29	0.36
Germany	1.13	0.99	1.15	1.02	0.84
Japan	0.40	0.40	0.38	0.32	0.23

Source: Computed from UN Comtrade database

Table 10 shows that the Export Intensity Indices of India with UAE, USA , Russia and Germany are greater than 1, implying India gives much more importance to these countries as a destination for its exports of Electrical, electronic equipment than the rest of the world does.

Section 4: RCA and RCII

While looking at the Export Intensity Index is one approach, the other involves the use of information regarding source countries which places high importance on its exports of Electrical, electronic equipment, in terms of value, relative to the importance in world exports; and likewise, also enjoying similar relative importance in the destination country's imports. The first is known as Revealed Comparative Advantage (RCA) and the second Revealed Comparative Import Inclination (RCII). RCA index for a commodity (or commodity group) exported from the source country is higher than 1 if its

importance is more in the source country's total exports than in world exports, and vice versa. Similarly, RCII index for the destination country's imports for a commodity (or commodity group) is higher than 1 if its importance is more in the destination country's overall imports than in world imports, and vice versa.

For the year 2019, the RCA of various countries' exports of Electrical, electronic equipment (ITC-HS Chapter 85) is given in table 11 below. India is at disadvantage in supply-side for exports of Electrical, electronic equipment to the world since RCA <1 as seen from table 11 below.

Table 11: RCA of various countries' exports of Electrical, electronic equipment (ITC-HS Chapter 85)

Countries	2015	2016	2017	2018	2019
China	1.80	1.68	1.76	1.98	1.75
Hongkong	3.41	3.28	3.47	4.04	3.65
Viet Nam	2.02			2.64	2.51
USA	0.94	0.89	0.93	0.97	0.86
Rep. of Korea	1.81	1.73	1.90	2.27	1.83
India	0.21	0.20	0.20	0.26	0.31

Source: Computed from UN Comtrade database

Similarity, if the RCII in the destination country is greater than 1 then the country imports Electrical, electronic equipment to an extent more than overall world trends warrant. Therefore, if India seeks to expand its exports, these countries are the preliminary list of options. Table 12 shows the RCII indices of various countries' imports of Electrical, electronic equipment (ITC-HS Chapter 85). Table 12 below shows that Hongkong and China have RCII>1 indicating a higher than average appetite for imports of the commodity that the rest of the world and these countries should thus serve as potent destination markets for India's electrical/electronic goods exports.

Table 12: RCII of various countries' imports of Electrical, electronic equipment (ITC-HS Chapter 85)

Countries	2015	2016	2017	2018	2019
USA	0.95	0.96	0.96	0.95	0.88
Hongkong	3.15	3.26	3.34	3.53	3.42
China	1.90	1.68	1.79	1.84	1.54
Japan	0.95	0.95	0.94	0.91	0.90
Germany	0.79	0.80	0.81	0.84	0.80
India	0.61	0.67	0.68	0.66	0.67

Source: Computed from UN Comtrade database

Section 5: Competitiveness Index and Intra-Industry Trade

The idea of market dominance can be viewed from a different perspective. The competitiveness index of India's export of Electrical, electronic equipment tells how important India's product is (in terms of market value share) with respect to its competitors in a destination country. While an index value greater than 1 is definitely good for India, a value less than 1 shows that it has been overshadowed by the products of other exporters. Table 13 shows the indices of Indian exports as well as other top exporters of Electrical, electronic equipment (China, Hongkong, Vietnam, USA and South Korea) for the top importing countries (USA, Hongkong, China, Japan and Germany). For Indian exports, the index is high only for USA (>1). It has poor values, especially for Hongkong, China and Japan, implying India must step up its game in these importing countries (with index < 1) to compete with other exporters of Electrical, electronic equipment.

Table 13: Competitiveness Indices (Product) of various exporter countries w.r.t Electrical, electronic equipment (ITC-HS Chapter 85)

Competitiveness Index (Product) of Exporter(Reporter) to Importer(Partner) in 2019						
		Partner				
		USA	Hongkong	China	Japan	Germany
Reporter	**China**	1.53	2.09	N/A	1.96	1.05
	Hongkong	0.01	N/A	0.02	0.01	0.03
	Viet Nam	1.78	0.70	2.06	1.53	0.60
	USA	N/A	0.37	0.46	0.74	0.63
	Rep. of Korea	0.74	1.21	2.91	0.76	0.48
	India	1.14	0.21	0.33	0.25	0.92

Source: Computed from UN Comtrade database

Table 14: Competitiveness Indices (Market) of various exporter countries w.r.t Electrical, electronic equipment (ITC-HS Chapter 85)

Competitiveness Index (Market) of Exporter(Reporter) to Importer(Partner) in 2019						
		Partner				
		USA	Hongkong	China	Japan	Germany
Reporter	**China**	1.94	1.07	N/A	1.94	2.43
	Hongkong	0.71	N/A	0.45	0.3	2.53
	Viet Nam	2.3	1.4	2.31	1.68	2.45
	USA	N/A	0.74	0.68	0.59	0.83
	Rep. of Korea	1.27	1.32	1.85	0.99	2.26
	India	0.26	0.06	0.22	0.19	0.57

Source: Computed from UN Comtrade database

Intra-industry trade is of importance as it can increase and expand markets. The standard indicator is the Index of Intra-industry Trade (IIT). The index can be calculated within individual sectors as well. Intra-industry trade is generally high in case of the manufacturing sector. An increase in IIT may signify a maturing of this sector, and hence, a regular monitoring of this index may be useful. Intra-industry trade is a common world-wide phenomenon – export and import of the commodities produced by the same industry or sector. The degree to which this occurs is generally measured by the Grubel-Lloyd Index, which is the difference between the exports of the particular sector to a partner country and imports of the products of the same sector from the same partner, divided by the sum of these two, and whole thing obtained subtracted from one.

The following table (Table 15) shows varying degrees of IIT between India and some major partners. The values are very high (>0.9) between India and USA and India and UK, showing greater interdependence (exports and imports by the same sector) in international trade within the same industry. The sources of gains from intra-industry trade between similar economies—namely, the learning that comes from a high degree of specialization and splitting up the value chain and from economies of scale—are not contradictory to the earlier theory of comparative advantage.

Table 15: Intra-Industry Trade in Electrical, electronic equipment (ITC-HS Chapter 85) between India and Some Major Importing Countries in 2019)

IIT between India and Partner Countries	
Countries	**Grubel-Lloyd Index in 2019**
United Arab Emirates	0.19
USA	0.99
China	0.08
Germany	0.58
United Kingdom	0.96
China, Hong Kong SAR	0.07
Japan	0.15

Source: Computed from UN Comtrade database

Section 6: Summary

For Lithium Primary Cells and Batteries, Hongkong, China, South Korea, Singapore and USA are the top five exporters of Lithium Primary Cells and Batteries from 2015 to 2019. Together, these five countries covered more than 75% per cent of export value in 2019. Mexico, USA, Israel, Singapore and China are the top five importers of Lithium Primary Cells and Batteries from 2015 to 2019. Together, these five countries around 45% per cent of import value in 2019.

UAE, USA, Israel, Hongkong and Malaysia are the countries which constituted the largest markets for India's exports of commodity class ITC-HS 850650 from 2015-2019 with export-value share of 57% in 2019. China, Hongkong, South Korea, Indonesia and Israel are the countries from which India imported

Lithium Primary Cells and Batteries, in descending order of magnitude of import-values, from 2015-2019 with total import-value share of 73% in 2019.

The market indicators for India in terms of Lithium Primary Cells and Batteries' trade can be improved with respect to other major importers. Lower values of the Competitiveness index between India and the major importing countries, particularly Hongkong, China and Japan are a testimony to this. Export Intensity Indices of India with UAE, USA, Russia and Germany are greater than 1, implying India gives much more importance to these countries as a destination for its exports of Electrical, electronic equipment than the rest of the world does.

***

1. Revealed Comparative Advantage Index (RCA): RCA for a commodity exported from a country means the importance of this commodity in the export trade of the country in comparison with the importance of the commodity in world exports. Mathematically,

$RCA_{ij} = (x_{ij}/X_{it})/(x_{wj}/X_{wt})$
where x_{ij} = country i's exports of commodity j
X_{it} = country i's total exports
x_{wj}= world exports of commodity j
X_{wt}= total world exports.
When $RCA_{ij} > 1$, i.e. when j's weight in i's exports (x_{ij}/X_{it}) is more than j's weight in world exports (x_{wj}/X_{wt}), country i is said to have a revealed comparative advantage in commodity j. There is a revealed comparative disadvantage if $RCA_{ij} < 1$. When $RCA_{ij} = 1$, there is neither comparative advantage or disadvantage.

By studying the RCA for a commodity exported from a country over time, it can be seen whether the country in question is gaining in comparative advantage regarding a particular commodity. If RCA is falling, the reasons require investigation. (x_{ij}/X_{it}) may have risen less or fallen more than proportionately than (x_{wj}/X_{wt}).

2. One way of checking the reasons for a fall in RCA for a particular commodity is seeing which markets are responsible for this fall. This can be seen from another, slightly different, indicator called Export Specialization Index (ESI).

$ESI = (x_{ij}/X_{it})/(m_{kj}/M_{kt})$, where
m_{kj} = import of commodity j to market k
M_{kt}= world imports of commodity k.
(m_{kj}/M_{kt}) gives the weight of j in market k. So, if RCA_{ij} is seen to fall, then it can be found out for which markets ESI has fallen. Special attention may then be given to those markets regarding the commodity in question.

3. Like RCA, the revealed comparative import intensity (RCII) can also be measured.
$RCII = (m_{ij}/M_{it})/(m_{wj}/M_{wt})$
where m_{ij} = country i's imports of commodity j
M_{it} = country i's total imports
m_{wj}= world imports of commodity j
M_{wt}= total world imports.
This gives an idea whether the proportion of imports of any commodity is more than expected, in terms of the share of that commodity in world imports.

4. Bilateral trade between countries is an important area of trade policy in that bilateral trade agreements are signed to increase trade. However, some points require to be examined before entering into these

agreements. Firstly, it is necessary to see whether there is trade complementarity between the two countries. That is, whether the exports of one country match with the imports of the other, and vice versa. Naturally, when trade complementarity is high between two countries, it is beneficial to enter into a trade agreement. If a partner country does not import what India generally exports, there is little point in entering into a trade agreement with that country. The Trade Complementarity Index (TCI) is given as follows:

$TCI = 1 - \sum (|m_{ik} - x_{ij}|/2)$, where
m_{ik}= share of commodity i in the imports of market k
x_{ij} = share of commodity i in the exports of country j.
It is evident that TCI can have values between 0 and 1. When these shares, are m_{ik} and x_{ij} are close to each other, (i.e. when trade complementarity increases) TCI is close to 1. As their difference increases, TCI falls.

TCIW = TCI between a country and the World.
RTCI (Relative Trade Complementarity Index) between country k and country j = (TCI between country k and country j) / (TCI between country k and the world)

RTCI gives a measure of the complementarity between two countries as compared to the complementarity between the first country and the world.

5. But another fact may be checked while proceeding to enter into a trade agreement. The trade between the two countries may already be quite high. This can be measured by the Export Intensity Index (EII).
$TII = (x_{ij}/X_{it})/(x_{wj}/X_{wt})$
where x_{ij} = country i's exports to country j
X_{it} = country i's exports to the world
x_{wj} = world exports to country j
X_{wt} = total world exports.
This essentially measures the relative importance of country j in country I's export trade, in comparison with country j's importance as world export destination. EII < 1 or >1 implies less than or more than expected bilateral trade, respectively. If EII is already high, there is little scope of further increasing bilateral trade between i and j. But if is low, and if TCI is high, bilateral trade can very well be increased through trade agreements.

6. A related indicator is the Export Similarity Index (XSI), which helps us identify a country's competitors.
$XSI = \sum [\min (X_{ij}, X_{ik})*100]$
where X_{ij}= share of commodity i in exports of country j
X_{ik}= share of commodity i in exports of country k
XSI can vary between 0 and 100. It will be seen that when X_{ij}= X_{ik} for all i's, XSI = 100, which means complete export similarity between countries j and k. As X_{ij} and X_{ik} start to differ, XSI falls. Countries exporting the same commodities are competitors in the world market, and export strategies, taking in to account such competition, have to be designed accordingly.

7. It is necessary to know whether the exports of a country are concentrated in a few products. A high concentration, while enabling a country to reap the benefits of specialization and economies of scale, also exposes a country to the risks arising from the vicissitudes of global trade. The Hirschman Index (HI), used by UNCTAD, is a handy measure for monitoring export concentration.

$$HI = \sqrt{[\sum Sq(x_i/X_t)]}$$

where x_i is the country's exports of commodity i

X_t is the country's total exports.

HI ranges from (1/n) to 1. The higher the value of HI, the higher the concentration of exports.

8. Intraindustry trade is of importance as it can increase and expand markets. The standard indicator is the Index of Intraindustry Trade (IIT).

$$IIT_{jk} = 1 - [\sum |X_{ijk} - M_{ijk}| / (X_{ijk} + M_{ijk})]$$

where X_{ijk} = exports of products of industry i from country j to country k

M_{ijk} = imports of products of industry i from country k to country j.

IIT can take values from 1 (extremely high intra-industry trade, exports equaling imports) to 0 (no interindustry trade at all).

_____