India's International Trade of Petroleum oils and oils from bituminous minerals, not crude …etc (ITCHS 2710)

Section 1: Introduction: The study uses trade indicators to analyse 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 Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710), to indicate the possible directions policy may take.

The data used in this study has been sourced from the United Nations Comtrade Database and the Export Import Data Bank, Department of Commerce. Computations are primarily based on data at the ITC-HS two-digit level (HS-27) and ITC-HS four-digit level (HS-2710) and the latest finalized data available on the UN Comtrade Database up to year 2020. In several cases, trends from 2016 to 2020 have been shown.

Table 1: ITCHS Classification of Petroleum oils and oils from bituminous minerals, not crude …etc.

ITCHS Code	Name/Description
2710	Name: Petroleum oils and oils from bituminous minerals, not crude; preparations n.e.c, containing by weight 70% or more of petroleum oils or oils from bituminous minerals; these being the basic constituents of the preparations; waste oils. Description: Petroleum oils and oils obtained from bituminous minerals, other than crude; preparations not elsewhere specified or included, containing by weight 70 % or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations; waste oils.

Section 2: Trends in International Trade i.e Exports & Imports of Petroleum oils and oils from bituminous minerals, not crude …etc

A glimpse of the top 15 exporters of Petroleum oils and oils from bituminous minerals, not crude etc. in the world is given in below Table: 2

Table 2 & 3 shows the top 15 exporters of Petroleum oils and oils from bituminous minerals, not crude etc. Singapore, UAE, Netherlands, USA, Areas, nes are the top 5 exporters from 2016 to 2020

Table 2: Exports of Petroleum oils and oils from bituminous minerals, not crude etc. (ITC HS 2710) in Million US dollars.

Countries	2016	2017	2018	2019	2020
Singapore	339.82	678.70	628.49	440.63	379.10
UAE	351.46	432.25	634.54	574.60	327.22
Netherlands	130.84	146.62	428.05	442.33	194.59
USA	195.17	222.81	300.12	268.26	142.70
Areas, nes	101.82	183.88	238.95	227.54	59.48
China	69.83	97.42	305.77	202.66	118.66
Malaysia	48.87	146.03	238.38	127.41	131.77
Israel	86.68	101.84	156.19	149.95	63.90
Nepal	56.49	91.81	134.87	135.64	81.40
Turkey	101.59	123.85	114.82	102.67	26.74
Mozambique	56.02	75.87	42.64	170.42	101.06
Australia	76.23	136.54	81.52	35.16	83.77
Oman	132.76	126.08	62.71	33.92	54.13
Rep. of Korea	59.90	75.38	99.09	79.06	76.97
United Rep. of Tanzania	89.78	65.94	86.82	68.05	48.10
Others	3492.93	4264.93	5863.66	5453.72	3345.34
Total Export Value	**5390.20**	**6969.95**	**9416.61**	**8512.02**	**5234.93**

Sources: Computed from UN Comtrade database

Table 3: Shares of countries in % in world export of Petroleum oils and oils from bituminous minerals, not crude etc. (ITCHS 2710)

Countries	2016	2017	2018	2019	2020
Singapore	6.30	9.74	6.67	5.18	7.24
UAE	6.52	6.20	6.74	6.75	6.25
Netherlands	2.43	2.10	4.55	5.20	3.72
USA	3.62	3.20	3.19	3.15	2.73
Areas, nes	1.89	2.64	2.54	2.67	1.14
China	1.30	1.40	3.25	2.38	2.27
Malaysia	0.91	2.10	2.53	1.50	2.52
Israel	1.61	1.46	1.66	1.76	1.22
Nepal	1.05	1.32	1.43	1.59	1.55
Turkey	1.88	1.78	1.22	1.21	0.51
Mozambique	1.04	1.09	0.45	2.00	1.93
Australia	1.41	1.96	0.87	0.41	1.60
Oman	2.46	1.81	0.67	0.40	1.03
Rep. of Korea	1.11	1.08	1.05	0.93	1.47
United Rep. of Tanzania	1.67	0.95	0.92	0.80	0.92
Others	64.80	61.19	62.27	64.07	63.90
Total Export Value	**100**	**100**	**100**	**100**	**100**

Sources: Computed from UN Comtrade database

Similarly, tables 4 and 5 below show the total import of Petroleum oils and oils from bituminous minerals, not crude …etc. by the top fifteen countries and their percentage shares respectively. The top five importers in the list consist of UAE, Rep of Korea, Singapore, Saudi Arabia and Russian Federation comprising more than 25% of the world imports of Petroleum oils and oils from bituminous minerals, not crude etc. in 2020

Table 4: Imports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710) in Million US dollars.

Countries	2016	2017	2018	2019	2020
UAE	104.98	114.80	144.07	198.15	116.21
Rep. of Korea	51.99	61.50	80.72	73.10	53.39
Singapore	57.74	45.87	60.13	62.99	50.91
Saudi Arabia	22.04	16.19	40.29	37.46	34.60
Russian Federation	18.75	15.08	28.85	41.59	37.35
Iraq	1.65	0.01	0.00	32.32	102.84
Malaysia	11.10	13.33	24.58	44.80	42.11
Oman	8.20	10.71	13.04	32.43	28.67
USA	6.78	15.92	40.41	12.60	10.76
Qatar	20.40	6.14	12.10	22.49	17.92
Algeria	3.64	5.78	40.02	27.86	0.03
Kuwait	1.75	9.33	13.66	14.13	9.93
China	4.18	6.68	0.84	6.80	14.58
Pakistan	10.61	8.39	13.55	0.00	0.00
Spain	7.15	4.03	7.14	6.90	3.73
Others	406.20	433.13	616.15	723.26	652.96
Total Import Values	**737.16**	**766.89**	**1135.55**	**1336.88**	**1175.99**

Sources: Computed from UN Comtrade database

Table 5: Shares of countries in % in world imports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710)

Countries	2016	2017	2018	2019	2020
UAE	14.24	14.97	12.69	14.82	9.88
Rep. of Korea	7.05	8.02	7.11	5.47	4.54
Singapore	7.83	5.98	5.30	4.71	4.33
Saudi Arabia	2.99	2.11	3.55	2.80	2.94
Russian Federation	2.54	1.97	2.54	3.11	3.18
Iraq	0.22	0.00	0.00	2.42	8.74
Malaysia	1.51	1.74	2.16	3.35	3.58
Oman	1.11	1.40	1.15	2.43	2.44
USA	0.92	2.08	3.56	0.94	0.92
Qatar	2.77	0.80	1.07	1.68	1.52
Algeria	0.49	0.75	3.52	2.08	0.00
Kuwait	0.24	1.22	1.20	1.06	0.84
China	0.57	0.87	0.07	0.51	1.24
Pakistan	1.44	1.09	1.19	0.00	0.00
Spain	0.97	0.53	0.63	0.52	0.32
Others	55.10	56.48	54.26	54.10	55.52
Total Import Values	**100**	**100**	**100**	**100**	**100**

Sources: Computed from UN Comtrade database

Tables 6 and 7 below show the top fifteen destinations for Indian exports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710) denoting the values and percentage shares respectively. Rep of Korea, Singapore, Russian Federation, UAE and Malaysia are the countries which constituted the largest markets for India's exports of commodity class ITC-HS 2710 from 2016-2020 with export-value share of 70% in 2020.

Table 6: India's exports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710) to various countries (in million US dollars)

Partner Country	2016	2017	2018	2019	2020
Rep. of Korea	44.96	56.77	72.46	63.47	48.93
Singapore	61.38	50.52	58.28	62.04	47.56
Russian Federation	16.30	28.76	26.04	31.45	17.62
UAE	2.84	15.78	16.38	56.00	25.20
Malaysia	8.55	11.59	17.53	34.11	39.70
USA	9.17	25.50	34.22	11.96	12.32
Oman	45.90	13.52	5.37	0.00	0.00
China	2.65	7.63	4.32	7.49	17.40
Sri Lanka	1.52	8.56	0.00	7.03	6.84
Spain	5.94	3.14	5.79	4.77	2.53
Qatar	8.27	2.11	0.34	10.37	0.00
Egypt	1.73	2.37	2.12	6.99	6.27
Other Asia, nes	2.34	3.04	1.68	8.23	3.60
Italy	0.58	7.99	6.87	3.12	0.33
Turkey	0.22	1.99	12.66	1.06	1.35
Others	24.48	37.07	44.23	25.51	24.97
Total Export Value	**236.82**	**276.34**	**308.30**	**333.60**	**254.61**

Sources: Computed from UN Comtrade database

Table 7: Various countries' share (in %) in Indian exports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710)

Partner Country	2016	2017	2018	2019	2020
Rep. of Korea	18.98	20.54	23.50	19.03	19.22
Singapore	25.92	18.28	18.90	18.60	18.68
Russian Federation	6.88	10.41	8.45	9.43	6.92
UAE	1.20	5.71	5.31	16.79	9.90
Malaysia	3.61	4.19	5.68	10.23	15.59
USA	3.87	9.23	11.10	3.58	4.84
Oman	19.38	4.89	1.74	0.00	0.00
China	1.12	2.76	1.40	2.25	6.83
Sri Lanka	0.64	3.10	0.00	2.11	2.69
Spain	2.51	1.14	1.88	1.43	0.99
Qatar	3.49	0.76	0.11	3.11	0.00
Egypt	0.73	0.86	0.69	2.09	2.46
Other Asia, nes	0.99	1.10	0.55	2.47	1.41
Italy	0.25	2.89	2.23	0.94	0.13
Turkey	0.09	0.72	4.11	0.32	0.53
Others	10.34	13.41	14.35	7.65	9.81
Total Export Value	**100**	**100**	**100**	**100**	**100**

Sources: Computed from UN Comtrade database

In similar vein, tables 8 and 9 show the top fifteen destinations for Indian imports of Petroleum oils and oils from bituminous minerals, not crude …etc denoting the values and percentage shares respectively. Singapore, USA, UAE, Turkey and Malaysia are the countries from which India imported Petroleum oils and oils from bituminous minerals, not crude …etc in descending order of magnitude of import-values, from 2016-2020 with total import-value share of around 48% in 2020

Table 8: India's imports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710) from various countries (in million US dollars)

Partner Country	2016	2017	2018	2019	2020
Singapore	284.77	413.28	389.91	268.78	208.99
USA	249.72	260.93	303.02	366.12	187.69
UAE	1.11	100.31	249.64	361.16	221.06
Turkey	180.32	184.39	271.40	196.78	98.42
Malaysia	87.25	230.57	240.35	127.40	118.79
Rep. of Korea	97.68	103.34	127.71	121.92	105.76
Other Asia, nes	87.77	115.35	154.04	84.11	53.20
Nepal	69.35	107.67	156.08	150.98	0.00
Australia	85.96	121.29	93.65	26.01	97.20
Japan	77.17	120.14	84.24	53.15	61.90
France	24.47	62.08	129.09	123.14	41.49
South Africa	69.85	89.10	46.05	85.39	59.11
Netherlands	54.44	58.88	50.55	131.49	40.20
United Kingdom	25.04	64.18	67.23	129.48	33.20
United Rep. of Tanzania	76.03	39.44	45.88	43.08	27.66
Others	522.45	589.48	608.83	678.89	384.11
Total Import Values	**1993.39**	**2660.44**	**3017.65**	**2947.89**	**1738.78**

Sources: Computed from UN Comtrade database

Table 9: Various countries' share in % in Indian imports of Petroleum oils and oils from bituminous minerals, not crude …etc. (ITCHS 2710)

Partner Country	2016	2017	2018	2019	2020
Singapore	14.29	15.53	12.92	9.12	12.02
USA	12.53	9.81	10.04	12.42	10.79
UAE	0.06	3.77	8.27	12.25	12.71
Turkey	9.05	6.93	8.99	6.68	5.66
Malaysia	4.38	8.67	7.96	4.32	6.83
Rep. of Korea	4.90	3.88	4.23	4.14	6.08
Other Asia, nes	4.40	4.34	5.10	2.85	3.06
Nepal	3.48	4.05	5.17	5.12	0.00
Australia	4.31	4.56	3.10	0.88	5.59
Japan	3.87	4.52	2.79	1.80	3.56
France	1.23	2.33	4.28	4.18	2.39
South Africa	3.50	3.35	1.53	2.90	3.40
Netherlands	2.73	2.21	1.68	4.46	2.31
United Kingdom	1.26	2.41	2.23	4.39	1.91
United Rep. of Tanzania	3.81	1.48	1.52	1.46	1.59
Others	26.21	22.16	20.18	23.03	22.09
Total Import Values	**100**	**100**	**100**	**100**	**100**

Sources: Computed from UN Comtrade database

Section3:ExportIntensityIndex

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 27, Petroleum oils and oils from bituminous minerals, not crude …etc. belong

Table 10: Export Trade Intensity Indices for Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27) of Countries w.r.t. India

Countries	2016	2017	2018	2019	2020
U A E	15.15	12.78	19.94	20.32	21.00
Australia	2.67	3.36	1.58	0.75	3.46
U S A	0.87	0.66	0.85	0.80	0.75
China	0.44	0.42	0.84	0.66	0.56
Brazil	0.36	0.07	0.30	1.23	0.56
Japan	0.65	0.72	0.32	0.40	0.41
U K	0.02	0.12	0.41	0.07	0.39
Germany	0.04	0.00	0.00	0.00	0.00

Source: Computed from UN Comtrade database

Table 10 shows that the Export Intensity Indices of India with UAE, Australia, and Brazil are greater than 1, implying India gives much more importance to these countries as a destination for its exports of Petroleum oils and oils from bituminous minerals, not crude…etc. 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 Petroleum oils and oils from bituminous minerals, not crude…etc, 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 than1 if its importance is more in the destination country's overall imports than in world imports, and vice versa

Table 11: RCA of various countries' exports of Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27)

Countries	2016	2017	2018	2019	2020
Nigeria	11.53	11.02	9.22	7.85	11.34
Azerbaijan	10.49	10.27	9.05	8.46	11.69
Kuwait	10.71	10.84	9.15	0.00	11.03
Brunei	0.00	10.27	8.51	8.23	10.43
Kazakhstan	7.26	9.26	6.94	6.11	7.50
India	1.27	1.40	1.48	1.31	1.36

Source: Computed from UN Comtrade database

For the year 2020, the RCA of various countries' exports of Petroleum oils and oils from bituminous minerals, not crude…etc, (ITC-HS Chapter 27) is given in table 11. India is at an advantage in supply-side for exports of Petroleum oils and oils from bituminous minerals, not crude…etc to the world since RCA >1 as seen from table 11.

Similarity, if the RCII in the destination country is greater than 1 then the country imports Petroleum oils and oils from bituminous minerals, not crude…etc 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: RCII of various countries' imports of Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27)

Countries	2016	2017	2018	2019	2020
India	2.59	2.24	2.49	2.50	2.90
Belarus	2.78	2.33	2.64	2.02	2.17
Greece	2.34	2.02	2.17	2.22	2.14
Cyprus	1.84	1.48	3.15	1.51	1.47
Burkina Faso	2.06	2.01	0.00	2.21	2.68
Japan	1.89	1.70	1.75	1.75	1.75

Source: Computed from UN Comtrade database

Table 12 shows the RCII indices of various countries' imports Petroleum oils and oils from bituminous minerals, not crude…etc ports of (ITC-HS Chapter 27). Table 12 below shows that Belarus, Greece, Cyprus, Burkina Faso & Japan 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 Petroleum oils and oils from bituminous minerals, not crude etc. goods exports

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 Petroleum oils and oils from bituminous minerals, not crude …etc 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 >1 is definitely good for India, similarly, an index value <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 Petroleum oils and oils from bituminous minerals, not crude …etc (China, Hong Kong, Vietnam, USA and South Korea) for the top importing countries (USA, Hong Kong, China, Japan and Germany). For Indian exports, the index is high only for USA (>1). It has poor values, especially for Hong Kong, China and Japan, implying India must step up its game in these importing countries (with index < 1) to compete with other exporters of Petroleum oils and oils from bituminous minerals, not crude …etc.

Table 13: Competitiveness Indices (Product) of various exporter countries w.r.t Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27)

Countries	2016	2017	2018	2019	2020
UAE	0.81	0.00	7.39	2.93	2.69
USA	0.74	0.56	0.61	0.80	0.74
UK	0.31	0.52	0.46	1.04	0.51
China	0.05	0.05	0.14	0.06	0.03
Germany	0.00	0.01	0.02	0.02	0.02

Source: Computed from UN Comtrade database

Table 13 shows the indices of Indian exports as well as other top exporters of Petroleum oils and oils from bituminous minerals, not crude …etc. UAE, USA, UK, China & Germany are the top importing countries. For Indian exports, the index is high only for UAE & UK (>1). It has poor values, especially for USA, China and Germany, implying India must step up its game in these importing countries (with index < 1) to compete with other exporters of Petroleum oils and oils from bituminous minerals, not crude …etc

Table 14: Competitiveness Indices (Market) of various exporter countries w.r.t Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27)

Countries	2016	2017	2018	2019	2020
UAE	0.24	0.00	1.77	0.71	0.81
USA	0.71	0.64	0.63	0.78	0.66
UK	0.47	0.88	0.72	1.65	0.86
China	0.13	0.15	0.39	0.17	0.06
Germany	0.00	0.02	0.04	0.06	0.04

Source: Computed from UN Comtrade database

Table 14 shows the indices of Indian exports as well as other top exporters of Petroleum oils and oils from bituminous minerals, not crude …etc. UAE, USA, UK, China & Germany are the top importing countries. For Indian exports, the index is high only for UAE & UK (>1). It has poor values, especially for USA, China and Germany, implying India must step up its game in these importing countries (with index < 1) to compete with other exporters of Petroleum oils and oils from bituminous minerals, not crude …etc

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

Table 15: Intra-Industry Trade in Mineral fuels, oils, distillation products, etc. (ITC-HS Chapter 27) between India and Some Major Importing Countries in 2020)

IIT between India and Partner Countries	
Countries	**Grubel-Lloyd Index in 2020**
United Arab Emirates	0.445
Iraq	0.010
Rep. of Korea	0.909
Singapore	0.437
Malaysia	0.993
Russian Federation	0.004

Source: Computed from UN Comtrade database

Table 15 shows varying degrees of IIT between India and some major partners. The values are very high (>0.9) between India and Malaysia and India and Rep of Korea 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

Section 6: Summary

For Petroleum oils and oils from bituminous minerals, not crude …etc., Singapore, UAE, Netherlands, USA, Areas nes are the top five exporters from 2016 to 2020 covering more than 21 percent of world export value of the commodity. The top five importers consist of UAE, Rep of Korea, Singapore, Saudi Arabia, Russian Federation comprising 25% of the world imports of Petroleum oils and oils …etc. in 2020. Singapore, UAE, The Netherlands are the countries which constituted the largest markets for India's exports of commodity class ITC-HS 2710 from 2016-2020, with export-value share of 17% in 2020. UAE, Republic of Korea & Singapore are the countries from which India imported Petroleum oils and oils from bituminous minerals etc., in descending order of magnitude of import values from 2016-2020 with total import-value share of around 19% in 2020. The market indicators for India in terms of Petroleum oils and oils from bituminous minerals, not crude …etc. can be improved with respect to other major importers. Lower values of the Competitiveness index between India and the major importing countries, particularly USA, China & Germany are testimony to this. Export Intensity Indices of India with UAE, UAE, Australia & Brazil are greater than 1, implying India gives much more importance to these countries as a destination for its exports of Petroleum oils and oils from bituminous minerals, not crude …etc. than the rest of the world does.

***

Appendix A

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,

$$RCAij = (xij/Xit)/(xwj/Xwt)$$

Where, xij = country i's exports of commodity j
Xit = country i's total exports
xwj= world exports of commodity j
Xwt= total world exports.

When RCAij > 1, i.e. when j's weight in i's exports (xij/Xit) is more than j's weight in world exports (xwj/Xwt), country i is said to have a revealed comparative advantage in commodity j. There is a revealed comparative disadvantage if RCAij < 1. When RCAij = 1, there is neither comparative advantage nor 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. (xij/Xit) may have risen less or fallen more than proportionately than (xwj/Xwt)

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).

$$ESI = (xij/Xit)/(mkj/Mkt),$$

Where, mkj = import of commodity j to market k
Mkt= world imports of commodity k.

(mkj/Mkt) gives the weight of j in market k. So, if RCAij 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.

$$RCII = (mij/Mit)/(mwj/Mwt)$$

Where mij = country i's imports of commodity j
Mit = country i's total imports
mwj= world imports of commodity j
Mwt= 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:

$$TCI = 1 - \sum (|mik - xij|/2)$$

Where, mik= share of commodity i in the imports of market k
xij = 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 mik and xij 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).

$$TII = (xij/Xit)/(xwj/Xwt)$$

where xij = country i's exports to country j
Xit = country i's exports to the world
xwj = world exports to country j
Xwt = 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 agreement

6. A related indicator is the Export Similarity Index (XSI), which helps us identify a country's competitors.

$$XSI = \sum [\min (Xij, Xik)*100]$$

Where, Xij= share of commodity i in exports of country j
Xik= share of commodity i in exports of country k

XSI can vary between 0 and 100. It will be seen that when Xij= Xik for all i's, XSI = 100, which means complete export similarity between countries j and k. As Xij and Xik 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.

$$HI = \sqrt{[\sum Sq(xi/Xt)]}$$

Where, xi is the country's exports of commodity i
Xt 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).

$$IITjk = 1 - [\sum |Xijk - Mijk| / (Xijk + Mijk)]$$

Where, Xijk = exports of products of industry i from country j to country k
Mijk = imports of products of industry i from country k to country j.

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