India's Export Trade of Milled Rice in the Recent Past – Aspects

Preface

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 milled rice, to indicate the possible directions policy may take. This study focuses on milled rice, with an emphasis on Basmati rice, because this commodity is one of India's traditional exports and generates major export revenue. Therefore, it is important to investigate the prospects of expansion of trade and of increasing the gains achieved from trade.

The data used in this study has been sourced from the United Nations Comtrade Database and the Export Import Data Bank. Computations are primarily based on data at the ITC-HS six-digit level as the ITC-HS codes are uniform across countries only up to this level. The latest finalised data available on the UN Comtrade Database is of 2018.¹ In some cases, trends from 2014 to 2018 have been shown.

The layout of the study is as follows:

Section 1: An introduction providing an overview of imports and exports of the commodity worldwide. Section 2: Deals with India's Export Intensity of the commodity with respect to various countries. Countries where market-specific policies can be implemented to boost exports are identified and the complete list is presented in Appendix A.

Section 3: Using the Revealed Comparative Advantage and the Revealed Comparative Import Inclinations indices, this section lists the countries where product-specific policies may be implemented to boost exports. The complete list is presented in Appendix B.

Section 4: Using the Competitiveness Index, this section discusses the dominating patterns of the major exporters of milled rice in the international markets. A full list of the exporting country with the highest import share in various countries is given in Appendix C.

Section 5: Discusses India's export of the commodity to the ASEAN, the BRICS, and the EU while assessing the impact of non-tariff barriers concerning Basmati rice in the EU.

Section 6: Provides relevant data for India's export of Basmati rice, at the ITC-HS 8-digit level.

Section 7: Compares and analyses the unit value of Indian exports of the commodity with that of other major exporters.

Section 8: Summary.

Appendix A: List of countries deserving market-specific export promotion policies.

Appendix B: List of countries deserving product-specific export promotion policies.

Appendix C: List of countries where the major exporters have the highest import shares of milled rice in the destination country.

Appendix D: The formulae of the trade indicators used.

¹ Data for 2019 is available for some countries in the UN Comtrade database and is given in this report where applicable.

Section 1: Introduction

"Basmati" is a long grain aromatic variety of rice traditionally grown at the Himalayan foothills of the Indian sub-continent. According to the Seeds Act, 1966, there are 29 varieties of Basmati rice grown in seven states of India covered under Geographical Indications. These areas include Western Uttar Pradesh, Punjab, Haryana, Uttarakhand, Jammu Division of J&K, Himachal Pradesh and Delhi. As far as international markets are concerned, India dominates the trade of fragrant rice with its Basmati rice. In 2018-19, India has exported 4,712.43 million US \$ worth of Basmati rice, which is an increment by 13.02% over the last fiscal year. In this report, we will see various analyses and aspects of India's export trade of Basmati rice. However, before that, we need to understand the classification of data structures available for international comparison and analysis. According to the ITC HS system, the code 10063020 is assigned to indicate the trade of Basmati rice in India. But, 8-digit classification codes are not uniform for all countries, which makes international comparisons infeasible. The best feasible option apart from the optimal is to work with the 6-digit classification code 100630, which contains Basmati rice and can be compared globally. ITCHS code 100630 is referred to as 'Rice, semimilled or wholly milled' (in the rest of the report, this and 'milled rice' will mean the same) and Table 1 outlines the relevant categories along with their description. Henceforth, we will use the 6-digit code for our analysis primarily and the 8-digit code wherever it may be applicable.

ITC HS Code	Description
10	Cereals
1006	Rice
100610	Rice in the husk (paddy or rough)
100620	Husked (brown) rice
100630	Semi-milled or wholly milled rice, whether or not polished or glazed
10063010	Rice, parboiled
10063020	Basmati rice
10063090	Other
100640	Broken rice

Table 1: ITCHS Classification of Rice

The production of rice, among other factors, depends mainly on the amount of rainfall. In years with timely onset of monsoon and good annual rainfall, a good harvest can be expected. Table 2 shows the largest producers of rice $(paddy)^2$ in the world and the quantity produced for the years 2014 to 2018. China is the largest producer of rice (paddy) followed by India and there is a consistent increase in India's production since 2015.

² Basmati (paddy) is a fraction of the total rice (paddy) produced.

Country	2014	2015	2016	2017	2018
China (mainland)	206,507,400	212,142,000	211,094,000	212,676,000	212,129,000
India	157,200,000	156,540,000	163,700,000	168,500,000	172,580,000
Indonesia	70,846,465	75,397,841	79,354,767	81,148,594	83,037,000
Bangladesh	51,806,593	51,805,464	50,452,866	54,148,000	56,417,319
Viet Nam	44,974,206	45,090,562	43,112,010	42,763,682	44,046,250
Thailand	32,620,160	27,702,191	25,312,378	32,687,757	32,192,087
Myanmar	26,423,300	26,210,318	25,672,832	25,624,866	25,418,142
Philippines	18,967,826	18,149,838	17,627,245	19,276,347	19,066,094
Brazil	12,175,602	12,301,201	10,622,189	12,464,766	11,749,192
Pakistan	10,504,200	10,201,840	10,273,968	11,174,816	10,802,949

Table 2: Countries with largest production of rice (paddy) in tonnes

Source: Computed from FAOSTAT database

A glimpse of the top twenty exporters of milled rice (ITCHS 100630) in the world is given in Table 3 below.

Countries	2014	2015	2016	2017	2018	2019
India	7,537.68	5,976.79	5,057.56	6,634.76	6,827.02	6,616.85
Thailand	4,859.10	4,139.62	3,818.72	4,517.70	5,028.59	3,741.85
Viet Nam	2,852.87	2,620.65	2,039.76	2,443.63	2,461.88	2,163.70
Pakistan	1,895.37	1,416.15	1,418.93	1,512.69	1,757.85	1,781.73
USA	1,306.55	1,331.56	1,131.62	1,118.36	1,123.68	1,210.26
Italy	596.54	497.04	466.15	508.50	526.98	531.27
Uruguay	419.68	288.32	310.04	354.39	313.65	ş
United Arab Emirates	126.11	459.13	468.79	291.50	275.67	§
Cambodia	229.00	282.98	303.54	338.30	407.30	ş
China	174.49	84.46	176.05	419.18	685.38	§
Belgium	207.94	181.25	178.13	190.64	212.71	172.48
Netherlands	186.41	165.42	145.94	160.63	203.39	214.94
Brazil	189.36	212.42	114.64	127.34	155.17	168.96
Australia	308.11	282.72	133.02	ş	ş	§
Argentina	191.47	121.66	156.66	131.81	121.76	105.08

Table 3: Exports of milled rice (ITCHS 100630) in million US dollars

Countries	2014	2015	2016	2017	2018	2019
Paraguay	88.14	80.09	125.64	122.74	125.69	§
Spain	103.02	88.14	86.68	98.84	113.04	131.14
Germany	92.66	85.97	83.20	77.31	78.71	66.13
United Kingdom	82.84	65.79	55.52	57.54	61.07	63.06
Russian Federation	82.97	82.79	47.04	55.46	46.77	§

Table 4 below shows the percentage shares of the top twenty exporters of milled rice. Not only is India the top exporter of this commodity but it also accounts for about 30 per cent of the global exports. Thailand, Vietnam, Pakistan and the USA export around 22, 12, 8 and 6 per cent respectively. Together, these five countries cover more than 75 per cent of exports.

Countries	2014	2015	2016	2017	2018
India	34.02%	31.15%	29.82%	33.67%	32.26%
Thailand	21.93%	21.58%	22.51%	22.93%	23.76%
Viet Nam	12.87%	13.66%	12.03%	12.40%	11.63%
Pakistan	8.55%	7.38%	8.37%	7.68%	8.31%
USA	5.90%	6.94%	6.67%	5.68%	5.31%
Italy	2.69%	2.59%	2.75%	2.58%	2.49%
Uruguay	1.89%	1.50%	1.83%	1.80%	1.48%
United Arab Emirates	0.57%	2.39%	2.76%	1.48%	1.30%
Cambodia	1.03%	1.47%	1.79%	1.72%	1.92%
China	0.79%	0.44%	1.04%	2.13%	3.24%
Belgium	0.94%	0.94%	1.05%	0.97%	1.01%
Netherlands	0.84%	0.86%	0.86%	0.82%	0.96%
Brazil	0.85%	1.11%	0.68%	0.65%	0.73%
Australia	1.39%	1.47%	0.78%	§	Ş
Argentina	0.86%	0.63%	0.92%	0.67%	0.58%
Paraguay	0.40%	0.42%	0.74%	0.62%	0.59%
Spain	0.46%	0.46%	0.51%	0.50%	0.53%
Germany	0.42%	0.45%	0.49%	0.39%	0.37%

Table 4: Shares of countries in world exports of milled rice (ITCHS 100630)

[§] Values not available, owing to non-reporting.

Countries	2014	2015	2016	2017	2018
United Kingdom	0.37%	0.34%	0.33%	0.29%	0.29%
Russian Federation	0.37%	0.43%	0.28%	0.28%	0.22%

We compute similar tables for the top importers of the commodity in the world. Tables 5 and 6 below show the total import values of milled rice by the top twenty countries and their percentage shares respectively.

Countries	2014	2015	2016	2017	2018	2019
Saudi Arabia	1,731.51	1,501.66	962.11	992.00	1,231.48	§
China	1,031.03	1,168.09	1,336.57	1,460.56	1,327.15	ş
United Arab Emirates	752.91	943.81	838.55	753.69	692.39	ş
USA	707.93	700.22	643.77	670.08	894.50	1,011.79
Iran	1,430.80	§	690.02	1,213.93	Ş	ş
Japan	413.18	502.84	428.26	340.70	475.78	471.21
South Africa	404.36	421.40	406.60	451.52	464.88	428.40
Malaysia	488.09	533.15	375.80	344.82	403.13	449.91
Côte d'Ivoire	278.44	391.84	384.77	449.10	584.40	476.77
Philippines	426.54	411.96	171.52	322.16	701.74	1,061.93
France	376.71	332.21	328.11	329.76	384.82	399.72
Indonesia	240.18	201.34	402.68	0.23	870.05	4.15
Kuwait	315.78	326.94	235.92	250.41	295.92	ş
Germany	300.29	278.88	268.67	270.39	297.30	298.15
China, Hong Kong SAR	300.14	275.05	249.90	243.21	290.82	291.12
Canada	283.06	277.00	236.26	233.28	299.48	358.40
United Kingdom	262.03	251.91	229.62	239.23	237.73	257.94
Singapore	308.80	249.24	190.86	196.66	204.73	218.05
Cameroon	271.95	298.86	232.26	303.41	Ş	ş
Oman	255.99	250.58	145.85	203.38	234.96	ş

Table 5: Imports of milled rice (ITCHS 100630) in million US dollars

Source: Computed from UN Comtrade database

[§] Values not available, owing to non-reporting.

Countries	2014	2015	2016	2017	2018
Saudi Arabia	10.34%	10.83%	7.58%	7.01%	8.39%
China	6.16%	8.43%	10.52%	10.32%	9.04%
United Arab Emirates	4.50%	6.81%	6.60%	5.33%	4.72%
USA	4.23%	5.05%	5.07%	4.74%	6.10%
Iran	8.55%	ş	5.43%	8.58%	ş
Japan	2.47%	3.63%	3.37%	2.41%	3.24%
South Africa	2.41%	3.04%	3.20%	3.19%	3.17%
Malaysia	2.92%	3.85%	2.96%	2.44%	2.75%
Côte d'Ivoire	1.66%	2.83%	3.03%	3.17%	3.98%
Philippines	2.55%	2.97%	1.35%	2.28%	4.78%
France	2.25%	2.40%	2.58%	2.33%	2.62%
Indonesia	1.43%	1.45%	3.17%	0.00%	5.93%
Kuwait	1.89%	2.36%	1.86%	1.77%	2.02%
Germany	1.79%	2.01%	2.12%	1.91%	2.03%
China, Hong Kong SAR	1.79%	1.98%	1.97%	1.72%	1.98%
Canada	1.69%	2.00%	1.86%	1.65%	2.04%
United Kingdom	1.56%	1.82%	1.81%	1.69%	1.62%
Singapore	1.84%	1.80%	1.50%	1.39%	1.40%
Cameroon	1.62%	2.16%	1.83%	2.14%	§
Oman	1.53%	1.81%	1.15%	1.44%	1.60%

Table 6: Shares of countries in world imports of milled rice (ITCHS 100630)

The top five importers in the list consist of middle-east countries of Saudi Arabia, the United Arab Emirates and Iran along with China and the USA. While both China and the USA happen to be among the top exporters and importers list, if we compare the absolute values of trade, China turns out to be a net importer of milled rice and USA a net exporter. Taking the list of the top 10 exporters in 2018 and the top 10 importers (and Iran) as well, illustrates the trade values of milled rice as it is exported from the countries on the left and imported by the countries on the right of the figure. Among these, countries with significant trade values are highlighted for better understanding.³

[§] Values not available, owing to non-reporting.

³ The colour used to represent a country is indicated on the block next to the country names. The sequence of the colouring starts with exporters and then moves to the importers.

According to , the three major exporters by trade value have been highlighted – India, Thailand and Vietnam. Additionally, Pakistan has been highlighted as well because it is the second-largest producer of Basmati rice after India. Among the top importers, Indian exports constitute a very high share in the imports of Iran, Saudi Arabia and the United Arab Emirates. On the other hand, the imports in China and the south-east Asian countries of the Philippines, Indonesia and Malaysia are dominated by milled rice from Vietnam and Thailand.



Figure 1 Trade of milled rice (ITCHS 100630) from top exporting countries to top importing countries

A detailed scenario of the above illustration is given in the table below. Table 7 shows the majors sources of the highest importers of milled rice, therefore the sources are no longer restricted to the major exporters, like in the above figure, and offers a wider range of information.

Destination Country	Source Country	Trade Value (million \$)	Share of total imports
	Viet Nam	689.94	51.99%
China	Thailand	337.63	25.44%
	Cambodia	121.40	9.15%
	Pakistan	108.25	8.16%
	Lao People's Dem. Rep.	34.82	2.62%
	India	983.02	79.82%
	USA	72.10	5.85%
Saudi Arabia	Pakistan	68.48	5.56%
	Thailand	44.46	3.61%
	Australia	38.25	3.11%
	India	836.71	68.93%
	Pakistan	231.24	19.05%
Iran ⁴	Thailand	52.47	4.32%
	Switzerland	31.61	2.60%
	United Arab Emirates	22.95	1.89%
	Thailand	566.03	63.28%
	India	197.82	22.12%
USA	China	28.82	3.22%
	Pakistan	23.29	2.60%
	Italy	14.06	1.57%
	Viet Nam	358.78	41.24%
	Thailand	333.52	38.33%
Indonesia	Pakistan	90.32	10.38%
	India	87.41	10.05%
	Indonesia	0.01	0.00%
	Thailand	355.18	50.61%
	Viet Nam	279.55	39.84%
Philippines	India	25.98	3.70%
	Pakistan	21.15	3.01%
	China	16.32	2.33%

Table 7: Top 5 sources of milled rice (ITCHS 100630) for every major importer in 2018

4 Values are based on the year 2017 due to non-reporting of import data in 2018.

Destination Country	Source Country	Trade Value (million \$)	Share of total imports
	India	542.90	78.41%
	Pakistan	80.35	11.61%
United Arab Emirates	Viet Nam	27.84	4.02%
	Thailand	19.23	2.78%
	Australia	7.80	1.13%
	China	158.18	27.07%
	Viet Nam	145.55	24.91%
Côte d'Ivoire	India	123.88	21.20%
	Thailand	61.88	10.59%
	Myanmar	52.49	8.98%
	USA	263.34	55.35%
	Thailand	112.93	23.74%
Japan	China	52.88	11.12%
	Australia	44.45	9.34%
	Pakistan	1.12	0.24%
	Thailand	302.82	65.14%
	India	129.17	27.79%
South Africa	United Arab Emirates	8.30	1.79%
	Hong Kong	6.35	1.37%
	Pakistan	2.96	0.64%

Source: Computed from UN Comtrade database

While the above illustration and table give a preliminary idea of the trading patterns of milled rice, tables 8 and 9 below show the top twenty destinations for Indian exports, denoting the values and percentage shares respectively. In addition to the list above, India also exports to other Middle East countries like Iraq, Kuwait, Yemen, Qatar, Oman and Turkey. We also find the presence of Indian exports in West African countries, such as Benin, Guinea, Côte d'Ivoire, and Liberia, in developed nations, such as the USA and the UK, and neighbouring countries, like Bangladesh, Nepal and Sri Lanka.

Table 8: India's exports of milled rice (ITCHS 100630) to various countries (in million US dollars)

Countries	2014	2015	2016	2017	2018	2019
Saudi Arabia	1,377.38	1,071.35	703.31	767.28	988.71	1,070.49

Countries	2014	2015	2016	2017	2018	2019
Iran	1,282.86	726.95	503.02	872.75	1,186.08	1,444.50
United Arab Emirates	410.69	560.78	636.89	511.51	505.21	349.09
Iraq	270.64	400.06	410.04	487.30	416.44	472.80
Benin	254.71	193.20	241.54	313.85	229.01	247.03
Bangladesh	309.53	168.47	11.22	374.98	321.13	17.19
Kuwait	299.57	256.79	158.29	183.22	199.97	226.02
Yemen	244.18	179.98	141.98	165.42	233.49	249.34
USA	204.45	159.29	142.93	173.50	199.47	206.76
Nepal	133.75	129.30	149.05	166.11	204.52	173.47
Guinea	127.99	132.69	173.01	177.95	170.27	121.95
United Kingdom	172.02	157.33	102.64	189.82	86.95	110.81
Qatar	206.72	87.18	99.88	136.93	117.30	122.60
Côte d'Ivoire	77.32	126.37	106.50	158.33	142.25	118.59
Oman	117.53	118.27	104.60	115.77	137.23	108.48
Sri Lanka	221.83	79.04	3.36	203.47	51.02	3.48
Somalia	76.05	93.07	109.16	135.89	125.59	131.28
Turkey	146.46	100.51	112.66	91.33	64.90	46.97
South Africa	141.12	105.17	103.18	74.59	70.28	74.44
Liberia	88.95	84.42	62.30	89.36	111.37	80.86

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Countries	2014	2015	2016	2017	2018	2019
Saudi Arabia	18.27%	17.93%	13.91%	11.56%	14.48%	16.18%
Iran	17.02%	12.16%	9.95%	13.15%	17.37%	21.83%
United Arab Emirates	5.45%	9.38%	12.59%	7.71%	7.40%	5.28%
Iraq	3.59%	6.69%	8.11%	7.34%	6.10%	7.15%
Benin	3.38%	3.23%	4.78%	4.73%	3.35%	3.73%
Bangladesh	4.11%	2.82%	0.22%	5.65%	4.70%	0.26%
Kuwait	3.97%	4.30%	3.13%	2.76%	2.93%	3.42%
Yemen	3.24%	3.01%	2.81%	2.49%	3.42%	3.77%

Table 9: Various countries' share in Indian exports of milled rice (ITCHS 100630)

Countries	2014	2015	2016	2017	2018	2019
USA	2.71%	2.67%	2.83%	2.62%	2.92%	3.12%
Nepal	1.77%	2.16%	2.95%	2.50%	3.00%	2.62%
Guinea	1.70%	2.22%	3.42%	2.68%	2.49%	1.84%
United Kingdom	2.28%	2.63%	2.03%	2.86%	1.27%	1.67%
Qatar	2.74%	1.46%	1.97%	2.06%	1.72%	1.85%
Côte d'Ivoire	1.03%	2.11%	2.11%	2.39%	2.08%	1.79%
Oman	1.56%	1.98%	2.07%	1.74%	2.01%	1.64%
Sri Lanka	2.94%	1.32%	0.07%	3.07%	0.75%	0.05%
Somalia	1.01%	1.56%	2.16%	2.05%	1.84%	1.98%
Turkey	1.94%	1.68%	2.23%	1.38%	0.95%	0.71%
South Africa	1.87%	1.76%	2.04%	1.12%	1.03%	1.13%
Liberia	1.18%	1.41%	1.23%	1.35%	1.63%	1.22%

While the supply-side of milled rice in the international market is strong, we need to assess the countries which have a significant share of the commodity in their import basket but do not give enough importance to India as a source country. To do this, we resort to the Export Intensity Index, explained in the following section.

Section 2: Export Intensity Index

Export Intensity Index 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 market as compared to the same country's market share in the world market.⁵ Table 10 below shows the indices of the countries with the highest imports of milled rice from the world and from India.

Countries	2014	2015	2016	2017	2018
Nepal	2.9908	3.2775	3.0344	1.8797	2.7064
Bangladesh	2.9572	3.2526	2.6460	1.8096	2.4281

Table 10: Export Intensity Indices for milled rice (ITCHS 100630) of Countries w.r.t. India

⁵ See Appendix D for the formula of Export Intensity Index.

Countries	2014	2015	2016	2017	2018
Kuwait	2.6935	2.9798	2.6695	1.7858	2.4663
Saudi Arabia	2.4604	2.6628	2.3441	1.5477	2.2559
United Arab Emirates	1.7870	2.4969	2.4028	1.3765	2.0449
Iran	2.6811	1.5916	1.1787	1.8416	2.0212
Yemen	1.8259	1.7263	1.8813	1.5104	1.7544
Iraq	1.0665	2.0003	2.3651	1.5476	1.6667
Benin	0.9477	1.2057	0.9458	1.6145	0.6712
South Africa	1.0453	0.9867	0.9159	1.7229	0.4752
USA	0.7670	0.7422	0.7274	1.1955	0.6175
Côte d'Ivoire	0.5406	0.9655	1.0971	1.1010	0.0000
Malaysia	0.1000	0.2018	0.2958	1.0994	0.3438
Philippines	0.0327	0.0015	0.0009	0.0693	0.1861
Japan	0.0032	0.0036	0.0035	0.0061	0.0058
China	0.0000	0.0027	0.0016	0.0016	0.0005

Table 10 shows that among the main importers of milled rice, the Export Intensity Indices with the neighbouring countries and countries in the Middle East are greater than 1, India gives much more importance to these countries as a destination for its exports of milled rice than the rest of the world does. Although an exhaustive list of importers is not shown in this table, there is room for improvement among the African countries, the South East Asian counties and the developed nations as their respective indices are less than 1.

Rearranging the Export Intensity Index, we can comment on the regions where market (i.e. destination) specific policies need to be taken. If India has a market share in the world, for commodity P (say s), which is greater than India's overall market share (for all commodities) in the world (say t), there is no reason to expect that India's market share for P in Country J, say g < s. g can be < s only when, for some reason, Country J imports P, but not sufficiently from India. In terms of the index, g < s is algebraically equivalent to when Export Intensity Index is less than 1. In such cases, market or destination-specific promotional policies will be needed. The same will be true when Country J's share in India's export of P falls below Country J's share in total world imports of P. When both coincide, there is an even stronger case for adoption of the market-specific promotional policies. Appendix A shows the list of such countries in the case of India's exports of milled rice.

Section 3: 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 milled rice, 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 imports for a commodity (or commodity group) is higher than 1 if its importance is importance is more in the destination country's overall imports than in world imports, and vice versa.⁶

To list countries with high RCA or RCII for milled rice in a year, it is sufficient to find of the share of the commodity in the country's export or import basket respectively, since its share in the world exports or imports remains constant in a given year. Using this for the year 2018, Figure below highlights the countries with a high export share of milled rice in their total exports while Figure represents the same for imports.⁷

⁶ See Appendix D for the formula of RCA and RCII.

⁷ Countries having a share of greater than 0.1 per cent have been highlighted.



with high export of milled rice (ITCHS 100630) to total exports (2018)

From Figure , it is evident that the ratio of exports of milled rice to the country's total exports is highest in Pakistan, about 0.074. Therefore, it is also expected that while calculating RCA indices for milled rice, Pakistan will be on the top of the list. Other top exporting countries in the same commodity, like India, Thailand, Vietnam, Cambodia, Uruguay; are also represented in the figure. However, the USA, one of the major exporters, is missing from the figure. Besides the top exporters, we also have other countries such as Paraguay, Suriname, Laos, Myanmar, Argentina and so on.

Similarly, Figure shows a number of countries having a relatively high ratio of imports of milled rice to the country's total imports. These countries are expected to have high RCII indices. The highest ratio is that of Benin with a value of about 0.081. Other countries which follow include Solomon Islands, Madagascar, Côte d'Ivoire, Mozambique, Sao Tome and Principe, Eswatini, and so on.



If the RCA for milled rice in the source country is greater than 1 then the country exports it to an extent more than overall world trends warrant. Hence these countries can be viewed as India's competitors in the international market. Table 11 below shows the RCA indices of the top exporters of milled rice and some of the countries highlighted in Figure . India has a very high RCA of 24.55 in 2018, but the highest, as inferred before, is of India's neighbouring country, Pakistan. The index of Pakistan is at least thrice that of India and it depends heavily on the export of milled rice.

Countries	2014	2015	2016	2017	2018
Pakistan	72.66	60.05	72.13	100.22	85.23
Uruguay	43.77	35.53	46.84	66.30	48.52
Cambodia	31.97	31.31	31.71	§	Ş
India	22.69	21.36	20.44	33.27	24.55
Thailand	20.39	18.28	18.66	§	23.07
Viet Nam	18.15	15.29	ş	ş	ş
Paraguay	8.74	9.09	15.56	20.87	16.12

Table 11: RCA of various countries' exports of milled rice (ITCHS 100630)

Countries	2014	2015	2016	2017	2018
Suriname	9.02	ş	15.42	§	6.09
Lao People's Dem. Rep.	2.78	3.19	§	ş	Ş
Myanmar	ş	ş	0.60	1.64	2.67
United Arab Emirates	0.49	2.20	2.76	§	0.53
Italy	1.05	1.00	1.03	1.44	1.08
USA	0.68	0.74	0.73	0.93	0.69
China	0.07	0.04	0.09	0.27	0.32

Similarity, if the RCII in the destination country is greater than 1 then the country imports milled rice 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 for top importers and some of the countries represented in figure .

Countries	2014	2015	2016	2017	2018
Solomon Islands	ş	123.73	114.14	110.91	92.9
Benin	15.05	50.74	50.05	§	120.53
Madagascar	55.5	39.51	41.25	ş	82.26
Yemen	41.92	57.5	Ş	§	§
Sao Tome and Principe	47.81	46.33	Ş	§	42.08
Côte d'Ivoire	34.42	54.58	ş	§	ş
Mozambique	29.7	25.31	ş	ş	48.12
Nepal	26.27	28.37	Ş	33.92	§
Kuwait	13.82	13.61	10.96	43.81	22.45
Saudi Arabia	14.18	11.77	9.72	ş	13.61
Bangladesh	Ş	10.61	ş	ş	ş
Philippines	§	§	ş	5.59	9.11
South Africa	5.57	5.03	7.83	9.59	7.47
United Arab Emirates	3.73	4.37	4.48	ş	2.11
Malaysia	3.22	§	3.23	3.13	2.77
China	0.68	0.85	1.22	1.31	0.87

Table 12: RCII of various countries' imports of milled rice (ITCHS 100630)

[§] Values not available, owing to non-reporting.

Countries	2014	2015	2016	2017	2018
Japan	0.7	1.07	1.02	0.9	0.95
USA	0.4	0.4	0.41	0.49	0.51
Eswatini	ş	ş	ş	ş	ş
Iran	§	§	§	§	ş
Iraq	§	ş	ş	ş	Ş

However, India already exports to many of these countries with a RCII greater than 1. The question that remains is, are the exports sufficiently high? If the RCA of India to these importing countries (not to the world, as was being discussed earlier) is > 1, it may be said that the exports are sufficiently high. This is applicable only because the importing countries' RCII (for the world) for the product is also > $1.^8$ On the other hand, if the RCA is < 1, then export of milled rice (in value terms) to those countries are not sufficiently high and it needs closer examination. The policy measures, in this case, must be directed towards making Indian exporters increase the share of milled rice in their export basket to these countries. Table 13 shows the RCA of India to the countries importing milled rice. All the countries, except the USA, have had RCII indices greater than 1, at least once within 2014 to 2018.

Countries	2014	2015	2016	2017	2018
Benin	20.26	20.97	28.22	28.80	28.15
Iraq	14.49	15.59	21.68	17.19	10.61
Yemen	7.72	17.26	16.31	14.31	16.71
Iran	12.27	10.28	10.73	14.91	19.69
Côte d'Ivoire	11.30	14.50	14.30	13.06	0.00
Madagascar	8.78	4.58	11.83	10.24	10.11
Sao Tome and Principe	13.14	10.78	2.84	5.36	8.68
Kuwait	10.63	9.35	5.77	5.93	7.10

Table 13: RCA of Indian exports of milled rice (ITCHS 100630) w.r.t. various countries

§ Values not available, owing to non-reporting.

⁸ The reason for this is not far to seek. Let the share of imports of product P in world imports be r%, that will theoretically be the percentage share of P in world exports too. If the destination country, say C, has an RCII for P > 1, the share of P in her imports, y > r. If all the countries of the world had the same RCA (in that case all, including India would have RCA = 1), the share of P exports of all countries, including India, would be x. Share in imports in different countries would vary according to their RCII for P. So, the share of P in India's exports to C should be y, and not less than y (if other factors do not come into play to spoil the whole thing), to another country it might be z, its RCII (which might be < or > 1). So, even if India's RCA for P = 1, its RCA for P in case of exports to C china would be > 1 (= y). Now, a commodity which has RCA for India > 1 has been chosen in this case. Let share of P in India's exports be q (q > r, as RCA for India for P > 1). Thus, RCA for P in case of exports from India to China should be > 1 (actually it should equal y*q, both y, q > 1, but we may go with the weaker condition). Hence, the necessity of both y and q to be > 1.

Countries	2014	2015	2016	2017	2018
Saudi Arabia	4.44	6.80	7.18	6.52	8.51
Bangladesh	2.08	1.35	0.10	2.31	1.73
Nepal	1.34	1.79	1.70	1.34	1.32
South Africa	1.04	1.22	1.64	0.81	0.83
United Arab Emirates	0.53	0.83	1.09	0.79	0.84
Mozambique	0.29	0.45	0.36	0.08	0.26
Malaysia	0.17	0.28	0.31	0.29	0.24
Philippines	0.24	0.01	0.00	0.05	0.92
USA	0.20	0.17	0.18	0.17	0.18
Eswatini	0.04	0.10	0.00	0.00	0.00
Japan	0.00	0.00	0.01	0.01	0.01
China	0.00	0.00	0.00	0.00	0.00
Solomon Islands	0.00	0.00	0.00	0.00	0.00

By a similar logic as given above, it can be established that if for a particular commodity, RCA for India and RCII for the importing country are both > 1, it can be expected that RCII for that commodity in that country's imports from India will be > 1. If this is not the case, the reasons thereof need to be investigated, and appropriate policy measures need to be taken. Actually, it implies that the country is not importing the particular commodity, here milled rice, in sufficient amount (in value terms) while importing from India. It is not necessarily that they are averse to buying from India in general, they may very well purchase other commodities from India, but – for some reason – not this particular product. Policies designed to make these products from India attractive to the importers of the destination country need to be adopted. Table 14 shows the RCII of countries importing milled rice from India. As mentioned before, all countries excepting the USA have had RCII indices greater than 1.

Countries	2014	2015	2016	2017	2018
Yemen	19.23	28.34	§	ş	ş
Kuwait	15.52	13.17	10.54	52.40	22.62
Sao Tome and Principe	28.00	34.32	§	§	2.54
Madagascar	21.09	10.78	16.48	ş	32.85
Saudi Arabia	15.87	12.05	11.01	§	19.18
Côte d'Ivoire	10.40	16.92	§	ş	ş

Table 14: RCII of various countries' imports of milled rice (ITCHS 100630) w.r.t. India

Countries	2014	2015	2016	2017	2018
Benin	0.90	8.53	3.62	ş	11.19
Bangladesh	ş	3.99	ş	ş	§
South Africa	2.18	1.58	3.05	4.77	3.72
Nepal	2.07	2.15	ş	4.62	§
Mozambique	4.55	1.39	§	§	0.46
United Arab Emirates	1.49	2.61	2.97	ş	1.31
Philippines	§	§	§	0.15	1.62
Malaysia	0.36	Ş	0.52	0.86	0.55
USA	0.21	0.19	0.25	0.50	0.39
Japan	0.00	0.01	0.01	0.02	0.02
China	ş	0.00	ş	0.00	0.00
Eswatini	ş	§	§	§	§
Iran	ş	Ş	ş	ş	§
Iraq	ş	Ş	§	ş	§
Solomon Islands	Ş	Ş	§	§	8

The exhaustive list of countries found out by the above analysis is presented in Appendix B. To expand exports of milled rice in these countries, India needs to adopt product-specific policies. However, before that, it is important to assess the market that already exists in each country. As an example, if we know that, for product P, country X's exports have the major share in the import markets of countries A, B and C; then it helps in designing and adapting a common product-specific policy. illustrates the exporting country which holds the maximum share of milled rice in each country.⁹

[§] Values not available, owing to non-reporting.

⁹ The source country represented in the figure must have a minimum market share of 30 per cent in the destination country. For simplicity, only the top five exporting countries are chosen. If these countries do not fulfil the criterion, then a region is denoted by 'NA'. It is possible that a country might import x (> 30) per cent from one of the top 5 exporters and the remaining (100-x) per cent from a country other than these five. In this case, the algorithm will incorrectly report the exporter with x per cent market share to be the highest. Though possible, it is not probable, since the top five exporters account for over 75 per cent of world exports and will be insignificant if such cases occur.



wise dominance market share of milled rice (ITCHS 100630) in 2018

By knowing that Vietnamese exports of milled rice dominate the markets of Cambodia, China, Fiji, Ghana Indonesia, and the Solomon Islands from , a cluster analysis may be performed to provide insights beneficial for designing policies or formulating marketing strategies. The complete list is provided in Appendix C.

Section 4: Competitiveness Index

The idea of market dominance can be viewed from a different perspective. The competitiveness index of India's export of milled rice 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 15 shows the indices of Indian exports of milled rice for the top importing countries. The indices are high only for Saudi Arabia and the United Arab Emirates. It has poor values, especially in China and Japan, which is consistent with the analysis so far.

Table 15: Competitiveness Index of Indian exports of milled rice (ITCHS 100630) in various countries

Countries 2014	2015	2016	2017	2018
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Countries	2014	2015	2016	2017	2018
Saudi Arabia	2.3732	2.5727	2.2306	ş	2.1485
China	ş	0.0000	Ş	0.0000	0.0001
United Arab Emirates	1.7097	2.6312	2.3703	ş	2.1104
USA	0.5854	0.6870	0.6657	0.4442	0.5952
Iran	ş	ş	§	ş	§
Japan	0.0033	0.0030	0.0029	0.0034	0.0043
South Africa	1.0273	1.1005	0.8329	0.4864	0.7478
Malaysia	0.1251	ş	0.1989	0.1833	0.2174
Côte d'Ivoire	0.8710	0.8411	§	§	§
Philippines	§	§	§	0.0094	0.0997

Section 5: India's exports to Trading Blocs and associations

This section discusses India's export of milled rice to the trading blocs, namely the EU and the ASEAN, and the members of BRICS. The EU has stringent rules for the import of agricultural products, especially concerning maximum residue limit (MRL) for Tricyclazole, a fungicide used by farmers against a disease which impacts Basmati rice crop. In 2017, it reduced the MRL permissible for its imports from 0.03 to 0.01 mg per kg. This has been a major setback for Indian exports of Basmati rice to the EU because it has failed the revised quality standards. Also, at present, under a code of practice and regulations signed in 2004, only eight varieties of basmati rice are allowed duty-free exports from India to EU and UK while those varieties notified afterwards, especially Pusa 1121 (2008) and Pusa 1509 (2013), which constitute the majority of aromatic rice exports annually, are subject to a higher level of import duties.¹⁰ On top of that, the EU and other developed countries indulge in trade-distorting farm subsidies called the Aggregate Measurement of Support (AMS) and a considerably large support deteriorates trade of the commodity.¹¹ Table 16 shows India's export, in terms of trade value, to the aforementioned trading blocs and associations.

[§] Values not available, owing to non-reporting.

¹⁰ Source: Das, S. (2017) 'India asks European Union to allow duty free exports of all basmati rice varieties', *The Financial Express*, 1 August. Available at: <u>https://www.financialexpress.com/market/commodities/india-asks-european-union-to-allow-duty-free-exports-of-all-basmati-rice-varieties/788627</u> (Accessed: 20 June 2020)

¹¹ Source: Suneja, k. (2020) 'India urges European Union to reduce non-tariff barriers on food', *The Economic Times*, 21 February. Available at: <u>https://economictimes.indiatimes.com/news/economy/foreign-trade/india-urges-european-union-to-reduce-non-tariff-barriers-on-food/articleshow/74234539.cms</u> (Accessed: 20 June 2020)

	2014	2015	2016	2017	2018	2019
ASEAN	138.11	107.33	83.08	94.24	202.07	116.14
BRICS	181.59	132.56	136.21	100.28	101.67	114.70
EU ¹²	420.37	344.63	279.90	441.90	230.72	233.93

Table 16: India's export of milled rice (ITCHS 100630) to ASEAN, BRICS and EU (in million dollars)

As evident from Table 16, India's export value of milled rice to the EU declined below \$300 million in 2016 and 2018. The former was due to disputes in payment and, consequently, the Directorate General of Foreign Trade (DGFT) came out with a notification banning documents against acceptance (DA) in the trade associated with the shipment of long-grained aromatic rice. The practice of DA, mostly being carried out by small exporters, might have been one of the reasons for the decline in India's basmati rice exports by 29% to 3,477.98 million US\$ in FY16, from a record 4,864.69 million US\$ reported in FY14. However, the volume of basmati exports had risen from 3.754 million tonnes (mt) to more than 4.045 mt in the same period.¹³ This was different from other rice-exporting countries like Pakistan, Vietnam and Thailand which did not allow DA transactions.¹⁴ In 2018, due to the stringent norms on the use of pesticides, much of India's rice exports to the EU failed the quality tests and it led to the decline in exports. There was no sign of recovery in 2019 as the export value remained almost the same as that of its previous year. Turning to the BRICS, the decline in exports was primarily because of lesser imports of Indian rice by China and South Africa. While there was a decrease in exports to the EU in 2018, this was partly compensated by the increase in exports to the ASEAN countries with an increment of more than 100 per cent over the previous year. However, this increase was not sustained in 2019 and the exports to the ASEAN countries fell from 202.07 million US\$ to 116.14 million US\$. Thus, India's export of milled rice to these three groups declined by approximately 70 million US\$ in 2019 from that of its previous year.

Section 6: Indian exports of Basmati rice

This section analyses the data on Indian exports of Basmati Rice at the ITCHS 8-digit level. Even though there had been an overall growth in the exports of Basmati rice in the fiscal year 2018-19, about 13 per cent, much of this growth was visible in the Middle East countries. Exports to the European nations, on the other hand, had declined. Therefore, it is likely that exports were being more concentrated on certain regions rather than spread over the world.

¹² Including the UK.

¹³ Data is sourced from Export Import Data Bank, Department of Commerce.

Source: Das, S. (2016) 'Basmati exports payment dispute: Ban on DA imposed', *The Financial Express*, 5 August. Available at: <u>https://www.financialexpress.com/market/commodities/basmati-exports-payment-dispute-ban-on-da-imposed/338700/</u> (Accessed: 20 June 2020).

Countries	Value in US\$ million		Quantity in thousands			
	2017-18	2018-19	% Growth	2017-18	2018-19	% Growth
Iran	904.73	1556.17	72	877421.56	1483698.13	69.1
Saudi Arabia	829.61	938.91	13.17	792480.06	867740.88	9.5
Iraq	435.52	399.43	-8.29	429965.94	385732.63	-10.29
United Arab Emirates	437.66	297.62	-32	429325.72	282377.66	-34.23
Yemen Republc	161.04	209.95	30.37	167687.61	201927.28	20.42
Kuwait	177.91	177.11	-0.45	166873.91	154748.2	-7.27
USA	149.01	168.74	13.24	126791.2	135607.73	6.95
UK	159.17	106.08	-33.35	180507.92	111924.7	-37.99
Oman	89.64	96.61	7.78	78083.35	87830.73	12.48
Qatar	82.08	76.08	-7.31	81098.81	73568.22	-9.29
Canada	47.87	53.46	11.67	41232.62	44805.09	8.66
Jordan	52.73	52.57	-0.31	52059.48	49170.84	-5.55
Australia	39.8	46.67	17.27	32382.74	37341.34	15.31
Israel	38.45	46.11	19.91	35627.5	40457.14	13.56
Turkey	51.64	40.82	-20.95	55639.59	41224.27	-25.91
Netherland	63.26	38.97	-38.4	69884.27	39217.65	-43.88
Baharain Islands	34.58	37.79	9.27	31402.81	35628.82	13.46
Mauritius	36.48	36.87	1.06	33075.3	32529.37	-1.65
Malaysia	32.97	24.6	-25.4	32314.86	22585.84	-30.11
Belgium	40.93	22.82	-44.26	40061.39	21746.88	-45.72
Syria	14.29	19.4	35.71	14530	19403	33.54
South Africa	16.38	18.59	13.49	14540.33	16527.49	13.67
Italy	42.55	16.9	-60.28	45321.84	14331	-68.38
Egypt	13.22	16.81	27.12	13845	16598.26	19.89
Singapore	15.04	15.39	2.33	12348.17	12675.8	2.65

Table 17: Indian exports of Basmati rice (ITCHS 10063020) to various countries

Source: Export Import Data Bank, Department of Commerce

Section 7: Unit values

Demand for an item is inversely related to its own price and directly related to the prices of its substitutes. Considering that the exports from other countries can be a replacement for Indian exports

of milled rice, if the prices of these substitutes fall relative to the prices of Indian exports, then the demand for Indian exports will fall as well. The absolute values are given in Table 18. Among the top exporters, Indian exports are priced in the middle in 2018, after the prices of Vietnamese exports increased sharply.

Countries	2014	2015	2016	2017	2018
USA	0.74	0.68	0.61	0.58	0.69
India	0.75	0.62	0.56	0.62	0.68
Viet Nam	0.47	0.43	0.45	0.46	0.94
Pakistan	0.59	0.53	0.45	0.48	0.52
Thailand	0.51	0.48	0.45	0.45	0.52

Table 18: Unit values of milled rice (ITCHS 100630) exports from top exporting countries (in US\$/kg)

Source: Computed from UN Comtrade database

Table 19 shows the prices relative to Indian exports which help in understanding the substitution effect, if any. In 2014, the prices of exports from other countries were less than that of India's. In 2018, each of the relative prices, except that of Pakistan, have increased and it creates an advantage for Indian exporters to capture market shares of others. With Vietnam's relative price jumping to more than double, India would certainly have the edge here.

Table 19: Unit values of milled rice exports (ITCHS 100630) from top exporting countries relative to India

Countries	2014	2015	2016	2017	2018
USA	0.98	1.09	1.10	0.93	1.02
India	1.00	1.00	1.00	1.00	1.00
Viet Nam	0.62	0.70	0.81	0.74	1.38
Pakistan	0.79	0.86	0.81	0.78	0.77
Thailand	0.68	0.78	0.81	0.73	0.76

Source: Computed from UN Comtrade database

Section 8: Summary

India remains the largest exporter of milled rice (and of Basmati rice) in the world. While the Gulf region is the most important importer of Indian milled rice, its market indicators can be improved with respect to other major importers. The low values of trade indices, such as the Export Trade Intensity, the Revealed Comparative Advantage, the Revealed Comparative Import Inclination, and the Competitiveness index; between India and the several importing countries, excepting most Middle-East countries, are a testament to this. Reviving Indian exports of milled rice in the EU, which is a high-

value market, is challenging as it has to meet the strict new quality norms imposed by them. This involves educating farmers to lower the use of Tricyclazole and other fungicides. The new norm gives Pakistan, India's main competitor in exports of Basmati rice, an advantage as their farmers do not use Tricyclazole.¹⁵ There is a need to expand the exports to several regions to strengthen the markets for Indian Basmati rice as well as induce higher stability in both international and domestic markets. This will prevent the contraction of exports due to external factors, like the recent hiatus of exports to Iran due to the US-Iran hostilities. The growing tensions between the two countries led the exporters worrying about pending payments and the All India Rice Exporters' Association decided to stop exports to Iran except in the case of advance payments or letter of credit. Such volatilities in the international market for Basmati rice can affect both the small producers and domestic consumers leading to uncertainties in the supply-side. Therefore, it is recommended that appropriate policies should be taken in order to expand exports to new markets, increase the stability of exports, and meet international standards of high-value markets.

¹⁵ Source: Das, S. (2018) 'Can basmati exports meet new EU norms? What export stakeholders need to ensure', *The Financial Express*, 30 November. Available at: <u>https://www.financialexpress.com/opinion/can-basmati-exports-meet-new-eu-norms-what-export-stakeholders-need-to-ensure/1398588/</u> (Accessed: 21 June 2020)

Appendix A

Countries requiring market-specific export-promotion policies. This list is based on the UN Comtrade data for 2018.

1.	AFGHANISTAN	16. GAMBIA	31. MALI
2.	ALBANIA	17. GHANA	32. MONGOLIA
3.	ANGOLA	18. GUAM	33. MOZAMBIQUE
4.	BENIN	19. GUINEA BISSAU	34. PAPUA N GNA
5.	BOLIVIA	20. HAITI	35. PHILIPPINES
6.	BOTSWANA	21. INDONESIA	36. SAO TOME
7.	BRUNEI	22. JAMAICA	37. SENEGAL
8.	CAMEROON	23. JORDAN	38. SIERRA LEONE
9.	COMOROS	24. KAZAKHSTAN	39. SOUTH AFRICA
10.	CONGO D. REP.	25. KENYA	40. SOUTH SUDAN
11.	CONGO P REP	26. LEBANON	41. SYRIA
12.	COSTA RICA	27. LIBYA	42. TANZANIA REP
13.	EQUTL GUINEA	28. MACAO	43. VENEZUELA
14.	FIJI IS	29. MALAWI	44. ZIMBABWE
15.	GABON	30. MALAYSIA	

Appendix B

Countries requiring product-specific export-promotion policies. This list is based on the UN Comtrade data for 2018 and is divided into two according to policy requirements for exporters of the source country (India) and importers of the destination country.

a)	For	source	country:
1.	AFGHANISTAN	6. CAMEROON	11. GABON
2.	ALBANIA	7. CONGO D. REP.	12. GAMBIA
3.	BOLIVIA	8. CONGO P REP	13. HAITI
4.	BOTSWANA	9. COSTA RICA	14. INDONESIA
5.	C AFRI REP	10. FIJI IS	15. ISRAEL

16. JAMAICA	22. MONGOLIA	28. SOUTH SUDAN
17. KAZAKHSTAN	23. MOZAMBIQUE	29. SRI LANKA DSR
18. KENYA	24. PAPUA N GNA	30. TANZANIA REP
19. MACAO	25. PHILIPPINES	31. U ARAB EMTS
20. MALAWI	26. SENEGAL	32. VENEZUELA
21. MALAYSIA	27. SOUTH AFRICA	33. ZIMBABWE
b) For	destination	country:
1. MALAYSIA	2. SRI LANKA DSR	3. U ARAB EMTS

Appendix C

List of top exporting countries dominating market shares in destination countries. Figures are based on data for 2018.

Source Country	Destination Country	Market share	Source Country	Destination Country	Market share
India	Azerbaijan	64.91%	Thailand	Mozambique	61.55%
India	Bahrain	76.21%	Thailand	Norway	41.34%
India	Myanmar	83.14%	Thailand	Singapore	47.22%
India	Kuwait	91.68%	Thailand	Viet Nam	46.73%
India	Maldives	80.17%	Thailand	South Africa	65.14%
India	Mauritius	92.09%	Thailand	Switzerland	31.93%
India	Oman	47.26%	Thailand	Thailand	41.22%
India	Namibia	63.55%	Thailand	USA	63.28%
India	Russian Federation	33.24%	Thailand	Cabo Verde	48.44%
India	Seychelles	82.22%	Thailand	Benin	75.93%
India	Eswatini	64.65%	Thailand	Philippines	50.61%
India	United Arab Emirates	78.41%	Thailand	Burkina Faso	39.48%
India	Ethiopia	98.02%	USA	Bermuda	98.59%
India	Georgia	32.63%	USA	Belize	68.42%
India	Gambia	53.03%	USA	Canada	40.90%

Source Country	Destination Country	Market share	Source Country	Destination Country	Market share
India	State of Palestine	58.99%	USA	Colombia	46.92%
India	Qatar	80.95%	USA	Ecuador	71.38%
India	Saudi Arabia	79.82%	USA	Japan	55.35%
India	Senegal	91.48%	USA	Jordan	49.55%
India	Ukraine	37.73%	USA	Rep. of Korea	94.16%
India	Egypt	41.25%	USA	Nicaragua	57.83%
Pakistan	Comoros	63.86%	USA	Palau	30.60%
Pakistan	Madagascar	39.67%	USA	United Rep. of Tanzania	94.58%
Pakistan	Kenya	53.96%	USA	Mexico	43.73%
Thailand	Angola	83.63%	USA	Aruba	81.37%
Thailand	Australia	36.56%	USA	Antigua and Barbuda	30.18%
Thailand	Armenia	67.31%	USA	Guyana	99.23%
Thailand	Brunei Darussalam	64.37%	USA	Saint Vincent and the Grenadines	100.00%
Thailand	Congo	94.38%	Viet Nam	Cambodia	75.46%
Thailand	China, Hong Kong SAR	63.98%	Viet Nam	China	51.99%
Thailand	Israel	35.87%	Viet Nam	Fiji	73.21%
Thailand	Lao People's Dem. Rep.	81.95%	Viet Nam	Ghana	56.11%
Thailand	China, Macao SAR	73.47%	Viet Nam	Indonesia	41.24%
Thailand	Malaysia	51.17%	Viet Nam	Solomon Isds	50.82%
Thailand	Morocco	41.68%		•	

Appendix D

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 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. (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 = $1 - \sum (|\text{mik} - \text{xij}|/2)$, 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

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 agreements.

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

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 equaling imports) to 0 (no interindustry trade at all).