

An Analysis of Bilateral Trade between India & China Since 2001

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Abstract

This research analyzes the existing bi-lateral trade patterns between India and China with a view to locate in the development context. It was essential to analyze the data since 2000 after implementing economic reforms in both countries. This research attempts to analyze the bilateral trade relation between these two countries, and also, focus on strategic frameworks. For determining the export performance, Revealed Symmetric Comparative Advantage (RSCA) method is applied. This study also recommends that trade balance is possible between India and China through making the right policies.

Keywords: Bilateral Trade, Comparative Advantage and Disadvantage, Revealed Symmetric Comparative Advantage (RSCA), Net-export

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1. Introduction

India and China are not only the vast populated countries but also the emerging economies in the world. Economic and political systems are not even similar in both countries. India is a capitalist country, while China is a socialist. Indian economy is more open and deregulated, but Chinese economy is highly regulated and state controlled. The economic, political and diplomatic relationships between India and China are based on 'competition and cooperation'.

Bilateral trade between these two countries have been started since 1954. China is one of the 3rd largest trading partners of India. Bi-lateral trade between India and China has reached at USD95.54 billion in 2018-19, and it is expected to be crossed more than USD100 billion by the end of 2019.

This research identified that, among top ten commodities that traded between these two countries, India has 'Comparative Advantages in Ores, slag and ash, Cotton, Copper and articles thereof, Plastics and articles thereof, Salt; Sulphur; earths and stone; plastering

materials, lime and cement, and China has 'Comparative Advantages in Organic chemicals, Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral, Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof, Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television. The final results of this research found that India supplied raw materials and China supplied manufactured items. And, because of price fluctuations in primary products, India faces trade imbalance, and China gains from bilateral trade.

The integration of the domestic economy through the twin channels of trade and capital flows has accelerated in the past two decades which, in turn, led to the India's GDP reaching \$2.47 trillion in 2017-2018 and \$2.76 trillion in 2018-2019. Total exports from India (merchandise and services) have increased by 8.73% by \$483.92 billion in 2018-2019, while total imports have increased by 9.42% to \$577.31 billion. In 2019, end exports are expected to reach \$540 billion (Government of India, n.d.).

India-China bilateral *trade* reached \$84.44 billion with 40% increase Indian exports to China in 2017. India's exports to China include antibiotics, diesel engines and granite amid, textile manufacturers, aluminum, copper, etc. India urges to cut the bilateral trade deficit with China by \$10 billion down to \$53 billion. The surge in exports was mainly due to greater demand for marine products, grapes, raw cotton, and plastic raw materials.

India's imports from China decreased down to \$5.9 billion in February 2018 from \$6.1 billion in January 2018. In 2014-2018, India's imports from China reached an all-time high of \$6.5 billion in December 2017 and a record low of \$2.3 billion in February 2014.

2. Literature Review

India is the fastest growing economy of the world currently in spite of China competing with it on all grounds. India's economy changes from state led growth model to pro-market model (Chatterji et al, 2014) that these factors; trade openness, wholesale/retail trade, banking and retail services have the positive relation with growth and potential to sustain the growth of Indian economy (Chatterji et al, 2014; Das. A et al, 2011; Marelli. E. & Signorelli. M, 2011). Whenever time passes, the role of India, China and ASEAN are increasing in the world and they are playing a significant role in bringing the whole Asian region together (Hong. Z, 2007). As mentioned before, trade is one of the factors that have positive impact on growth of an economy. Geographic size and isolation could affect the total and composition of trade of a country and distance between the countries also have a positive impact on bilateral trade between the countries (Leamer. E & Levinsohn. J, 1994). Countries like India and China are opened up their boarders for trades on mid-1980s and late 1970s respectively, (Economic Survey of India, 2007; Ye. M, 2009). After independence, India's pattern of trade began to change and liberalization caused the trade expansion towards IIT (intra-industry trade) (Veeramani, 2002). India and China have signed bilateral trade agreement with each other on 1954s (Ministry of External Affairs, Government of India), and these two countries become their most important partners that India has emerged as one of the top ten trading partners of China whereas China has become one of the top three trading partners of India in the recent years (Sahu. D, 2018). The trend of India's trade with China's market followed an in depth study of increasing regionalism between India and China to focus on sustainable trade potential of India and China (Mohanty S.K, 2014). Bilateral trade between these two countries have been studied to check the Comparative Advantage, and found that Indi has CA

in traditional sector and in some manufacture sector, but China has CA in electronic goods and industrial sectors (Beretta. S & Lenti. R, 2012; Wu. Y & Zhou. Z, 2006). Some other analysis shows broad similarities in the structure of comparative advantage for India and China that enjoy comparative advantage for labor and resource intensive sectors in the global market respectively (Batra. A, Khan. Z; 2005) and both countries had improvement in comparative advantage in technology and human capital intensive goods (Veeramani, 2008). Trade intensity between these two countries are not as high as it has to be, India's exports to China could account for 14% of India's GDP growth while imports from China could only contribute 11.5% to India's GDP growth, so there is the potential for growth in bilateral trade between the two economies (Wu. Y & Zhou. Z, 2006, Sahu. D, 2018). Chinese and Indian policymakers are now working to improve trade and economic cooperation (Wu. Y & Zhou. Z, 2006). India as compared to China needed to do away with the bottlenecks on infrastructures and policy rigidity of the factor markets if they want to have an efficient resource allocation process and export activities in India (Veeramani, 2008).

This study is used to analyze the trends and patterns of commodities trade in India, identifying the top ten exports and imports commodities of India and study the bilateral trade between India and China for the top ten commodities.

3. Research Method

We have collected the data from relevant websites (International Trade Center and Directorate General of Commercial Intelligence and Statistics (DGCI&S), which is under the Ministry of Commerce, Government of India) over a certain period of time 2001s to 2018s. We reviewed the trade patterns in terms of both volumes and values of goods and commodities, and identified the factors and variables which are determining the performance of trade. We also observed the degree of openness of the economies of India and China. Commodities are sorted from the hundred 2-digit code (Harmonized System) of grouped commodities from 2001s to 2018s and thereafter, top 10 traded exports and imports from each year are also analyzed which are based on the absolute value from the hundred commodities. From the top ten export and import commodities of each year, we added for the total absolute value of each year and sort the highest and find the top ten traded commodities out of the total added.

Thus the purpose of this study is to distinguish the behavior of trade through revealed comparative analysis (RCA), which is the most widely used measured index from Balassa's (1965) RCA. RCA can be defined as the measurement of relative export performance of a country. In other words, RCA is the relative country's share of world exports of a product or commodity divided by its share of total world export. It shows the export performance of the country which can be useful in indicating trade potential of the country. Countries with identical RCA figures are likely to have low bilateral trade intensities unless there is involvement of intra-industry trade. Specifically, The RCA index for country (i) and commodity (j) is calculated as follows:

$$RCA_{ij} = \frac{\frac{x_{ij}}{x_{it}}}{\frac{x_{wj}}{x_{wt}}}$$

Where, x_{ij} = the values of export of product j by country i

x_{it} = total export of country i

x_{wj} = the values of world exports of product j

x_{wt} = world total exports

The interpretation of RCA is relatively simple. The index value is ranged from 0 to ∞ with 1 as the breakeven point. That is, a value less than one means the country has no comparative advantage; on the other hand, a value above one implies the product has a revealed comparative advantage in the product.

However, for this paper, since the world consist of two countries that are into trading, this index will be using the modified version of Nath, Lui and Tochkov (2015) which is expressed as below:

$$RCA_{ij} = \frac{\frac{X_{ij}}{\sum_{j=1}^n X_{ij}}}{\frac{X_{ij} + M_{ij}}{\sum_{j=1}^n X_{ij} + \sum_{j=1}^n M_{ij}}}$$

Here X_{ij} denotes the values of India's exports of commodities j ($j=1, \dots, n$) to country i ($i=$ China). M_{ij} is the value of country i 's exports of commodities j to India (i.e. India's import of commodities j from China). In other words, the bilateral RCA index is the share of a given commodities in total India's exports to China relative to the share of India's trade (exports as well as imports) in this commodities with China in total India's commodity trade with China. In this also the value takes the range from 0 to where values exceeding 1 indicates that India has comparative advantage (CA) in j and values between 0 and 1 indicates that India has comparative disadvantage (CDA) in a given commodities vis-a-vis China.

RCA index however suffers from the problem of asymmetry and has a tendency net trade flows and intra-industry trade. It is asymmetric for the reason that, values on one side of unity are not comparable with those on the other side. To address this problem, Dalum, Laursen and Villumsen (1998) suggest transforming the RCA into;

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

where, RSCA is the revealed symmetric comparative advantage (RSCA). The interpretation of RSCA is slight different from the interpretation of RCA in such a way that the index value ranges between -1 to +1. Positive values indicate that India has a CA with China while negative values indicate that the India has CDA vis-à-vis China in commodities j . That being said, this would not be a serious issue because we are not examining distributional dynamics and evolution of CA; we are simply trying to know which commodities has CA over China.

4. Result and Discussion

4.1. Trends and patterns of India's Trade with the Rest of the World

India has opened its borders for international countries from 1991 after economic reforms have been made. From that time India started to grow in international arena. Nowadays, India is the third largest economy in nominal GDP, and its export has been increased by 662.4 percent since 2000s, (Author's findings based on Directorate General of Commercial Intelligence and Statistics, 2017). The available data is showing that since 2001s, total

exports of India to the rest of the world were 3564.54 billion dollars and imports were 5325.28 billion dollars. The following table shows that in 2013s and 2018 India attached the highest points of exports and imports by 336.61 billion dollars and 507.58 billion dollars respectively. On the other hand, the lowest point of exports and imports of India were in 2001s by 43.88 and 50.67 billion dollars respectively. These data also show that in last eighteen years India has grown very fast than other countries.

Table 1: Trend and Patterns of India's Trade with the Rest of the World

Year	Total Export		Total Import		Trade Balance in (Billion US \$)
	Amount in Billion \$	Growth Rate (%)	Amount in Billion \$	Growth Rate (%)	
2001	43.88	3.56	50.67	-1.65	-6.79
2002	50.10	14.17	57.45	13.39	-7.36
2003	59.36	18.49	72.43	26.07	-13.07
2004	75.90	27.87	98.98	36.66	-23.08
2005	100.35	32.21	140.86	42.31	-40.51
2006	121.20	20.77	178.21	26.52	-57.01
2007	145.90	20.38	218.65	22.69	-72.75
2008	181.86	24.65	315.71	44.39	-133.85
2009	176.77	-2.80	266.40	-15.62	-89.64
2010	220.41	24.69	350.03	31.39	-129.62
2011	301.48	36.78	462.40	32.10	-160.92
2012	289.56	-3.95	488.98	5.75	-199.41
2013	336.61	16.25	466.05	-4.69	-129.43
2014	317.54	-5.66	459.37	-1.43	-141.82
2015	264.38	-16.74	390.74	-14.94	-126.36
2016	260.33	-1.53	356.70	-8.71	-96.38
2017	295.85	13.64	444.05	24.49	-148.21
2018	323.06	9.20	507.58	14.31	-184.52

Source: International Trade Center (Trade Map)

The above data also show that in eighteen years India had trade deficit that among these years in 2012s it was at the highest point by -199.4 billion dollars and in 2001s it was at lowest point by -6.7 billion dollars. On the other hand, the above data show the trade annual growth rate of India since 2001s. Generally, India has experienced positive annual growth rate in its trade with other countries. The highest exports and imports annual growth rate were in 2011s and 2008s by 36.7 percent and 44.3 percent respectively. In 2015s and 2009s, India has experienced the lowest growth rate by -16.7 percent and -15.62 percent in exports and imports respectively.

4.2. Commodities-Wise trade of India with the Rest of the World Since 2001s

Top ten commodities are found from hundred 2-digit code (Harmonized System) of grouped commodities from 2001s to 2018s. The following table shows top ten commodities that India was exported to different countries and imported from different countries. The top three

commodities are those commodities that India has exported and imported much more than the other commodities and a trade deficit is remarkable too.

Table 2: Top Ten Export and Import Commodities of India to the Rest of the World in Selected years and Total since 2001s

Cod e	Product Label	Exports (Billion \$)				Cod e	Product Label	Imports (Billion \$)			
		200 1	2010	2018	Total			2001	2010	2018	Total
'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	2.15	37.98	48.29	547.38	'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	15.77	110.8	168.59	1766.80
'71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad ...	7.02	32.46	40.10	516.89	'71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad ...	9.69	68.63	65.03	818.35
'84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	1.58	8.15	20.40	159.37	'84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	4.23	27.77	43.23	435.59
'29	Organic chemicals	1.62	8.59	17.74	152.60	'85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	2.97	32.26	52.40	433.86
'87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	0.87	9.29	18.24	152.00	'29	Organic chemicals	1.77	12.12	22.58	194.08
'30	Pharmaceutical products	1.05	6.10	14.28	125.08	'72	Iron and steel	1.06	10.70	11.97	146.10
'85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television.	1.32	8.71	11.79	122.40	'39	Plastics and articles thereof	0.72	7.33	15.19	120.16

'62	Articles of apparel and clothing accessories, not knitted or crocheted	3.24	6.04	8.13	116.1 1	'15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal ...	1.50	6.44	10.16	113.71
'72	Iron and steel	0.92	7.00	9.98	112.7 2	'99	Commodities not elsewhere specified	0.82 3	8.78	2.38	100.71
'52	Cotton	2.13	6.89	8.13	99.39	'90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical ...	1.14	5.29	9.46	88.83

Source: Author's Findings from International Trade Center (Trade Map)

The above table also shows that the export and import of the commodities are increased in eighteen years. The export amount of (Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...) in 2001s was 2.15 billion dollars that it increased to 48.29 billion dollars in 2018s. In that time, the amount of imported of this commodity has been increased from 15.77 billion dollars to 168.59 billion dollars. So may we can analyze, those commodities that their exports are much more than their imports, India has comparative disadvantage on it.

4.3. Bilateral Trade Between India and China

China is one of the most important partner of India in trade. Since 2001, the total trade (Export + Import) of India with china was 835.45 billion dollars, more than the other countries in the world. India imports more from China, and export more to USA, United Arab Emirates and China respectively. From 2001s to 2018s the total export of India to China is increased from 0.9 billion dollars to 16.4 billion dollars that shows an increase of 1678.12 percent. On the other hand, in that period of time, the total import from China is increased from 1.8 billion dollars to 73.7 billion dollars that shows 3934.82 percent increase.

Table 3: India's bilateral Trade with China, Trade Growth Rate and Share of Trade Since 2001s

Year	Exports			Imports		
	Amount in (Billion \$)	Share in (%)	Growth Rate (%)	Amount in (Billion \$)	Share in (%)	Growth Rate (%)
2001	0.92	2.1	-	1.83	3.6	-
2002	1.53	3.1	66	2.62	4.6	43
2003	2.57	4.3	68	3.62	5	38
2004	4.10	5.4	60	6.05	6.1	67
2005	7.18	7.2	75	10.17	7.2	68
2006	7.83	6.5	9	15.64	8.8	54
2007	9.49	6.5	21	24.58	11.2	57
2008	10.09	5.6	6	31.59	10	29

2009	10.37	5.9	3	30.61	11.5	-3
2010	17.44	7.9	68	41.25	11.8	35
2011	16.72	5.5	-4	55.48	12	35
2012	14.73	5.1	-12	54.14	11.1	-2
2013	16.42	4.9	11	51.64	11.1	-5
2014	13.43	4.2	-18	58.23	12.7	13
2015	9.58	3.6	-29	61.60	15.8	6
2016	8.92	3.4	-7	60.48	17	-2
2017	12.49	4.2	40	71.97	16.2	19
2018	16.40	5.1	31	73.74	14.5	2

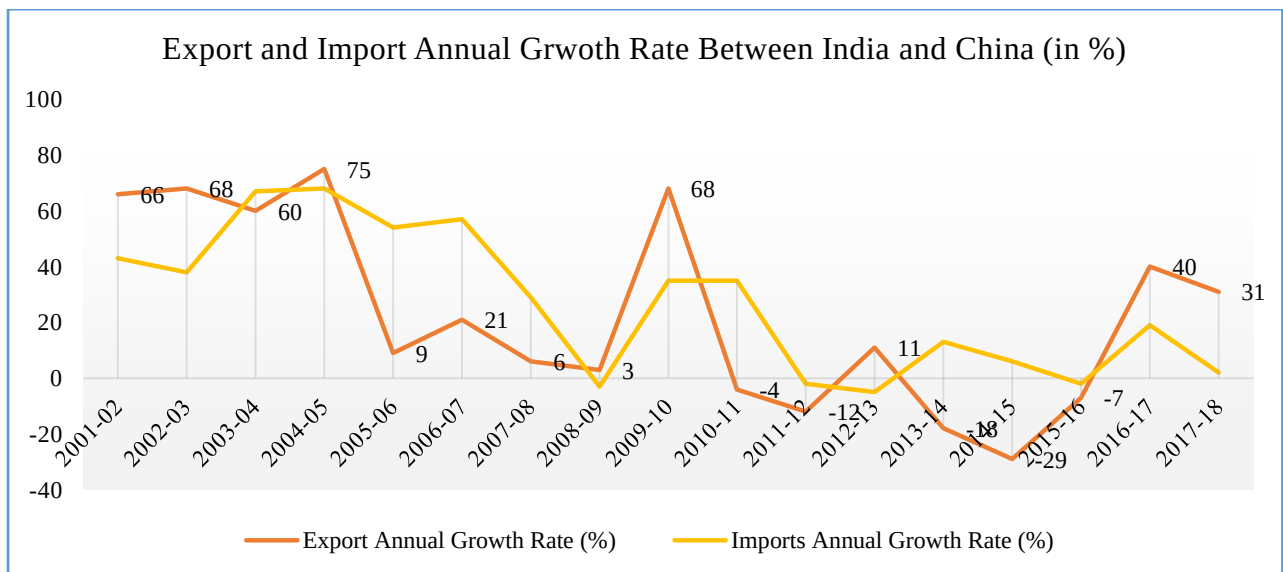
Source: International Trade Center (Trade Map)

The above table is showing the trends of trade between India and China with growth rate and share of this trade in total trade of India since 2001s in billion dollars and percentage respectively. In 2010s, India has exported 10.3 billion dollars to China more than the other years and in that time the total share of China in total exports of India was 7.9 percent. The lowest amount that India has exported to China was 0.9 billion in 2001s and in that time the total share of China in India's total exports was 2.1 percent, the lowest percentage share. On the other hand, in 2018s and 2001s India has imported the highest and lowest amount from China about 73.7 billion dollars and 1.8 billion dollars respectively. But in 2017s and 2001s the total share of China in India's total imports was 16.2 percent (the highest) and 3.6 percent (the lowest) respectively. The above table also shows that the highest exports annual growth rate of India to China was in 2005s by 75 percent increase than 2004s. The lowest annual growth rate of exports of India to China was in 2016 by -29 percent. On the other hand, the highest and lowest annual growth rate of imports of India from China were 68 percent and -5 percent in FY 2005s and FY 2013s respectively



Source: International Trade Center (Trade Map)

Figure 1: Share of Bilateral Trade Between India and China



Source: International Trade Center (Trade Map)

Figure 2: Growth Rate of Bilateral Trade Between India and China

4.3.1. Commodities-wise trade between India and China since 2001s

The below table shows the total exports and import values to China and from China respectively obtained from computation of highest total given by the sorting of all top ten traded commodities of each year i.e. from 2001s to 2018s. Among the top ten commodities, these commodities Ores, slag and ash, with US \$ 46.08 billion, Cotton with US\$ 25.64 billion and Copper and articles thereof with US\$ 17.37 billion were exported more to China respectively.

Table 5: Top Ten Commodities Exported to China and Imported from China in Selected Years and Total Trade since 2001s

Code	Product Label	Exports (Billion \$)				Code	Product Label	Imports (Billion \$)			
		2001	2010	2018	Total			2001	2010	2018	Total
'26	Ores, slag and ash	2.15	37.98	48.29	46.08	'85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	15.77	110.8	168.59	194.87
'52	Cotton	7.02	32.46	40.10	25.64	'84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	9.69	68.63	65.03	117.32
'74	Copper and articles	1.58	8.15	20.40	17.37	'29	Organic chemicals	4.23	27.77	43.23	63.54

	thereof										
'29	Organic chemicals	1.62	8.59	17.74	14.29	'99	Commodities not elsewhere specified	2.97	32.26	52.40	23
'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	0.87	9.29	18.24	10.57	'31	Fertilizers	1.77	12.12	22.58	22.15
'39	Plastics and articles thereof	1.05	6.10	14.28	6.98	'72	Iron and steel	1.06	10.70	11.97	20.96
'72	Iron and steel	1.32	8.71	11.79	6.85	'39	Plastics and articles thereof	0.72	7.33	15.19	16.81
'25	Salt; Sulphur; earths and stone; plastering materials, lime and cement	3.24	6.04	8.13	6.58	'73	Articles of iron or steel	1.50	6.44	10.16	16.42
'84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	0.92	7.00	9.98	5.73	'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	0.823	8.78	2.38	13.92
'52	Cotton	2.13	6.89	8.13	3.66	'90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical ...	1.14	5.29	9.46	12.48

Source: Author's Findings from International Trade Center (Trade Map)

On the other hand, among the top ten commodities these three commodities had the most values in importing from China; electrical machinery and equipment and parts thereof; sound recorders and reproducers, television with 194.87 billion dollars, machinery, mechanical

appliances, nuclear reactors, boilers; parts thereof with 117.32 billion dollars and organic chemicals with 63.54 billion dollars respectively. The above data are showing that India majorly import the technological goods from China and export more cotton and organic chemical goods.

4.4. Measure of Revealed Symmetric Comparative Advantage (RSCA)

Before joining the RSCA, we need to examine the RCA to determine the relative advantage or disadvantage of a particular country in a particular class of goods or services. Here for this study, RCA is calculated by considering the top ten export commodities as shown in Table 3. The RCA indicates that the indices must be in the range 0 to ∞ , representing values greater than 1 Comparative Advantages, and values between 0 and 1 indicating CDA. In contrast, the RSCA indicates that the value index should be from -1 to 1 and positive values indicate that the country has a CA (comparative advantage) while the negative value indicates a country has a CDA (comparative disadvantage). The measures of the Revealed Symmetrical Comparative Advantage for bilateral trade between India and China are presented in Table 5.

Table 5: RCA of India's Trade with China

Year s	Ores , slag and ash	Cotto n	Coppe r and article s thereof	Organic chemical s	Mineral fuels, mineral oils and products of their distillation ; bituminou s substances ; mineral ...	Plastic s and article s thereof	Iro n and steel	Salt; Sulphur; earths and stone; plasterin g materials , lime and cement	Machinery , mechanica l appliances , nuclear reactors, boilers; parts thereof	Electrical machinery and equipment and parts thereof; sound recorders and reproducers , television ...
2001	2.81	2.50	1.00	0.76	0.02	2.62	1.96	1.23	0.12	0.12
2002	2.57	2.06	2.01	0.71	0.06	2.30	2.61	1.77	0.24	0.05
2003	2.36	1.52	1.89	0.59	0.60	1.92	2.36	1.65	0.27	0.06
2004	2.33	1.59	1.90	0.71	0.06	2.04	2.17	1.73	0.25	0.05
2005	2.37	1.60	1.81	0.64	0.07	1.59	1.78	1.76	0.13	0.05
2006	2.93	2.49	2.55	0.73	0.15	1.68	1.34	2.31	0.16	0.05
2007	3.53	3.06	3.01	0.78	0.27	1.16	0.68	2.81	0.17	0.04
2008	4.08	3.50	2.57	0.57	0.39	0.93	0.44	2.82	0.14	0.05
2009	3.94	3.34	3.30	0.56	0.65	1.18	1.49	2.95	0.22	0.09
2010	3.35	3.11	3.21	0.57	1.24	1.08	0.86	2.66	0.13	0.06
2011	4.25	4.08	3.81	0.75	2.28	1.46	1.06	3.17	0.16	0.10

2012	4.59	4.44	4.23	0.85	1.37	1.51	0.76	3.92	0.18	0.09
2013	4.06	3.94	3.76	0.69	2.37	1.47	1.09	3.76	0.20	0.09
2014	5.00	5.06	4.87	0.71	3.52	1.02	0.36	4.71	0.27	0.10
2015	7.05	6.96	6.54	0.92	3.40	1.23	0.46	6.56	0.32	0.09
2016	7.61	7.10	6.23	0.96	4.13	0.99	0.92	6.83	0.32	0.14
2017	6.63	6.08	5.86	1.39	3.76	1.12	1.32	5.90	0.33	0.11
2018	5.33	5.07	4.04	1.45	4.01	1.54	1.00	4.51	0.32	0.12

Source: Author's Calculation from International Trade Center (Trade Map)

The above table shows the Revealed Comparative Advantage of India with China since 2001s. As mentioned before, the numbers above (1) means India has Comparative Advantage and less than (1) means India has Comparative Disadvantage in trade with China. We found that India had CA on these goods; (Ores, slag and ash, Cotton, Copper and articles thereof, Plastics and articles thereof, Salt; Sulphur; earths and stone; plastering materials, lime and cement) in trade with China. On the other hand, India had CDA in trade with China in these goods; (Organic chemicals, Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral, Iron and steel, Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof, Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...).

However, Because the RCA index suffers from the problem of asymmetry and has a tendency net trade flows and intra-industry trade. It is asymmetric for the reason that, values on one side of unity are not comparable with those on the other side. For this reason, we are going to check the Revealed Symmetric Comparative Advantage (RSCA) too.

Table 6: Revealed Symmetric Comparative Advantage (RSCA) of India with China

Years	Ores, slag and ash	Cotton	Copper and articles thereof	Organic chemicals	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	Plastics and articles thereof	Iron and steel	Salt; Sulphur; earths and stone; plastering materials, lime and cement	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...
2001	0.47	0.43	0.00	-0.14	-0.97	0.45	0.32	0.10	-0.79	-0.79
2002	0.44	0.35	0.33	-0.17	-0.88	0.39	0.45	0.28	-0.61	-0.90
2003	0.40	0.21	0.31	-0.26	-0.25	0.31	0.40	0.24	-0.57	-0.89
2004	0.40	0.23	0.31	-0.17	-0.89	0.34	0.37	0.27	-0.60	-0.90
2005	0.41	0.23	0.29	-0.22	-0.87	0.23	0.28	0.28	-0.77	-0.91
2006	0.49	0.43	0.44	-0.16	-0.74	0.25	0.15	0.40	-0.72	-0.90

2007	0.56	0.51	0.50	-0.12	-0.58	0.08	-0.19	0.47	-0.72	-0.91
2008	0.61	0.56	0.44	-0.28	-0.44	-0.04	-0.39	0.48	-0.76	-0.91
2009	0.59	0.54	0.53	-0.28	-0.21	0.08	0.20	0.49	-0.64	-0.83
2010	0.54	0.51	0.53	-0.28	0.11	0.04	-0.07	0.45	-0.78	-0.89
2011	0.62	0.61	0.58	-0.14	0.39	0.19	0.03	0.52	-0.73	-0.81
2012	0.64	0.63	0.62	-0.08	0.15	0.20	-0.14	0.59	-0.70	-0.84
2013	0.60	0.60	0.58	-0.18	0.41	0.19	0.04	0.58	-0.66	-0.84
2014	0.67	0.67	0.66	-0.17	0.56	0.01	-0.47	0.65	-0.57	-0.81
2015	0.75	0.75	0.73	-0.04	0.55	0.10	-0.37	0.74	-0.52	-0.83
2016	0.77	0.75	0.72	-0.02	0.61	-0.01	-0.04	0.74	-0.51	-0.75
2017	0.74	0.72	0.71	0.16	0.58	0.06	0.14	0.71	-0.50	-0.80
2018	0.68	0.67	0.60	0.18	0.60	0.21	0.00	0.64	-0.52	-0.78

Source: Author's Calculation from International Trade Center (Trade Map)

The above table shows the Revealed Symmetric Comparative Advantage (RSCA) of India's trade with China since 2001s. As we mentioned before, the range of RSCA is between -1 and +1. The positive values show the CA of the India and the negative values show the CA of China in trade with India. All the above data show that India had CA on (Ores, slag and ash, Cotton, Copper and articles thereof, Plastics and articles thereof, Salt; Sulphur; earths and stone; plastering materials, lime and cement) in trade with China. On the other hand, China had Comparative Advantage in trade with India in these goods; (Organic chemicals, Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral, Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof, Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...). Iron and Plastic commodities are those commodities that sometimes India had CA on it and sometimes China. In 2018s, India had CA in Iron and Plastic commodities. The data also show that in 2018s, India had Comparative Advantage in eight top commodities and China had CA just in two types of commodities. The Comparative Advantage of China just was in these commodities: (Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof, Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...) in 2018s.

Generally, we can analyze that India has CA on labor intensive commodities and China has Comparative Advantages on capital intensive goods in trade with each other. At the end we can say that India has to focus more on exporting more labor intensive goods and its government has to support the producers of these commodities.

4.5. Bilateral Trade Intensity Between India and China

Features of trade between two countries can be evaluated by different statistical indices. One of those indices is Intensity of trade index that has given by (Kojima in 1964). In this index, exports and imports intensities of both countries are analyzed. The formula is as the following that (i) is related to India and (j) is refer to China.

$$XIII_i = \frac{\frac{x_{ij}}{X_{iw}}}{\frac{M_{jw}}{M_w - M_{iw}}} \quad MIII_i = \frac{\frac{m_{ij}}{M_{iw}}}{\frac{X_{jw}}{X_w - X_{iw}}}$$

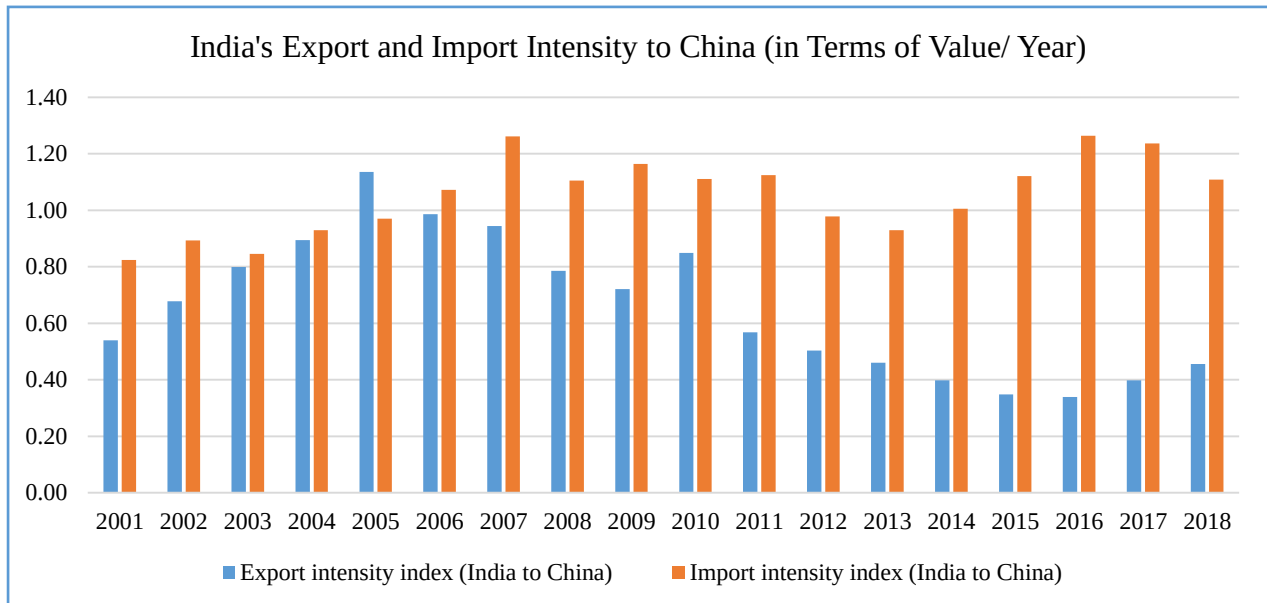
Where; $XIII_i$ is the export intensity index of country (i), x_{ij} is referring to export of country (i) to country (j), X_{iw} is referring to the total export of country (i) to the rest of the world, M_{jw} is referring to the total imports of country (j) from the rest of the world, M_w is referring to the total import of the world, M_{iw} is related to the import of country (i) to the rest of the world and X_w is refer to the total world export.

These indices reflect the ratio of the share of country (i)'s trade on country (j); compared to the share of world trade on country (j). If the number is greater than (1) we can interpret that the flow of trade is going to more and less than (1) means that the intensity of the trade between two countries are less.

Table 4: Bilateral Trade Intensity Between India and China

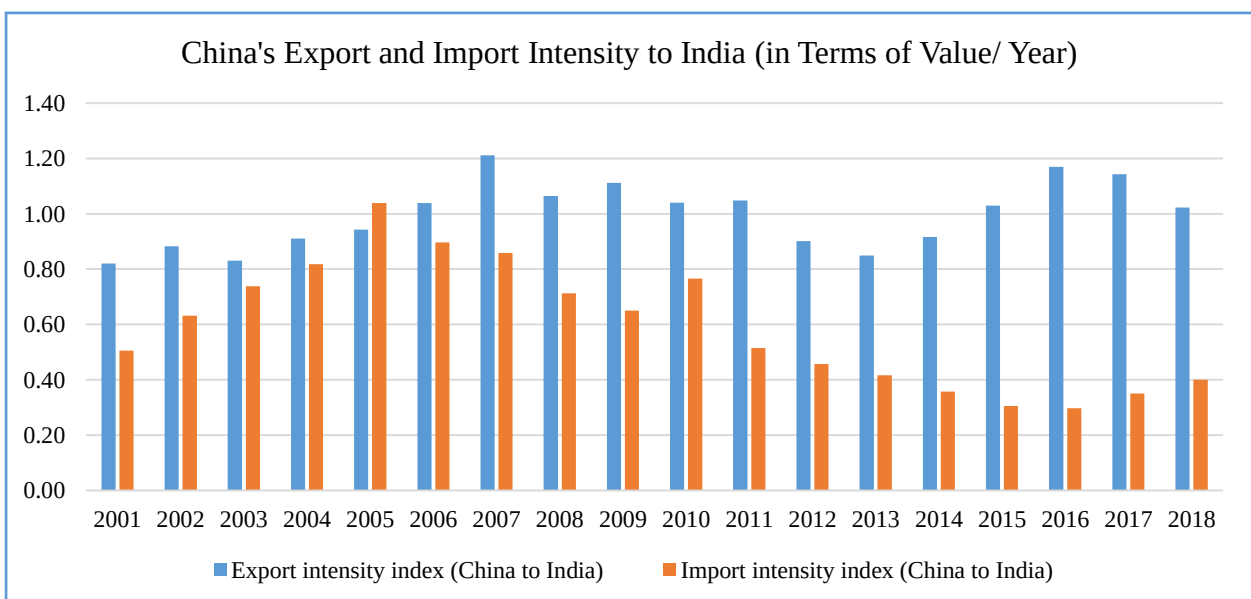
Year	Exports Intensity Index		Imports Intensity Index	
	India to China	China to India	India From China	China From India
2001	0.54	0.82	0.82	0.51
2002	0.68	0.88	0.89	0.63
2003	0.80	0.83	0.85	0.74
2004	0.89	0.91	0.93	0.82
2005	1.14	0.94	0.97	1.04
2006	0.99	1.04	1.07	0.90
2007	0.94	1.21	1.26	0.86
2008	0.79	1.06	1.10	0.71
2009	0.72	1.11	1.16	0.65
2010	0.85	1.04	1.11	0.77
2011	0.57	1.05	1.12	0.52
2012	0.50	0.90	0.98	0.46
2013	0.46	0.85	0.93	0.42
2014	0.40	0.92	1.01	0.36
2015	0.35	1.03	1.12	0.31
2016	0.34	1.17	1.26	0.30
2017	0.40	1.14	1.24	0.35
2018	0.46	1.02	1.11	0.40

Source: Author's Findings



Source: Author's Findings

Figure 3: India's Export and Import Intensity to China (in Terms of Value/ Year) Since 2001



Source: Author's Findings

Figure 4: China's Export and Import Intensity to India (in Terms of Value/ Year) Since 2001

The above table shows the bilateral trade intensity between India and China since 2001s. In eighteen years, the exports intensity index of India was less than one except 2005. On the other hand, in most of the time China had exports intensity index more than one. But in imports, India had more intensity index than China. From the above data we can analyze that China exports more to India because it has exports intensity than India and India imports more from China because it has imports intensity than China in this bilateral trade.

5. Conclusion

Trends of bi-lateral trade between India and China clearly show that it is in favor of China. Because China exports diversified manufactured items: chemicals, electrical machinery and equipment, cement, nuclear reactors, miner fuels and oils, and other technological products, while India exports primary raw materials: ores, slag and ash, organics, cottons and plastics, and iron and steel.

By applying Revealed Symmetric Comparative Advantage (RSCA) method, we found that, among top ten commodities that traded between these two countries, India has Comparative Advantages in Ores, slag and ash, Cotton, Copper and articles thereof, Plastics and articles thereof, Salt; Sulphur; earths and stone; plastering materials, lime and cement, and China has Comparative Advantages in Organic chemicals, Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral, Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof, Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television. We also identified that, China has more intensity to export than India and India has more intensity to imports than China in this bilateral trade.

Based on findings of the present study, India and China can achieve the goals through economic integration, and people to people contacts at all levels. Through investment promotion, joint establishment of ventures, and technological transfer, trade can be promoted. Moreover, the policy makers of these countries need to formulate appropriate and effective policy in order to encourage FDI and expand trade volume in order to further stimulate economic growth. There is a need to remove all obstacles including tariffs and non-tariffs barriers which are responsible factors for poor performance of trade and growth in India and China.

For future research it is suggested that cross-country analysis, long period data, and more sophisticated econometric techniques, if use covering the main determinants of trade including FDI in the context of development will certainly give more robust results and largely help policy makers.

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