



Composition and Direction of India's Foreign Trade with China: An Analytical Study

Samar Das* & Ariful Hoque**

Abstract

The present study aims to comprehensively analyze the dynamics of India-China trade from 2006 (the emergence of BRICS) to 2023, focusing on a selected bundle of 10 SITC digit-1 level commodities. Utilizing secondary data, the research employs a few select trade indicators like Revealed comparative advantage (RCA) index, Revealed import dependency (RID) index, Net, Gross and Income terms of trade, Export intensity index (EII), Import intensity index and trade share analysis. The findings of the study reveal a volatile and imbalanced trade relationship between India and China over the study period. India's export share to China peaked at 4.67% in 2010 but dropped to 1.95% by 2022, while imports from China steadily rose, reaching 13.24% in 2015 with marginal decline thereafter. India's export intensity with China remained below one, indicating underperformance in exports, while the import intensity was generally above one, showing a stronger reliance on imports, particularly from 2013

* Research Scholar, Department of Economics, Tripura University (A Central University), Tripura West

** Assistant Professor & Head, Department of Economics, Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya (A Govt. Model Degree College), Eraligool, Sribhum, Assam

to 2019. India's Net Barter Terms of Trade (NBTT) were consistently favorable, with India gaining more from exports compared to imports, especially in 2016. However, China's Gross Barter Terms of Trade (GBTT) were more favorable, requiring India to export more for imports. China's higher Income Terms of Trade (ITT) demonstrated stronger purchasing power. India's comparative advantage in products like crude materials and animal fats, where China has high import reliance, suggests potential for increased exports to China. On the other hand, India could benefit from importing more machinery and chemicals from China, where China holds a comparative advantage.

Keywords: Trade Share, RCA, RID, Intensity of Trade, Terms of Trade.

Introduction

The present global trade scenario is witnessing dynamic changes. Recent developments around the world clearly show that no nation can completely isolate itself from the rest of the world and survive independently for a long time. Today's world is completely different from what it was on few decades ago. Globalization and economic cooperation have been strengthened in terms of opening up of economies, barrier-free trade in goods and services, and the free movement of factors of production (Agarwal, 2002). This phenomenal trend is evident in the establishment of BRICS group, comprising Brazil, Russia, India, China and South Africa. The rapid pace of change, driven by emerging economies on the global stage, has created a highly competitive environment for other nations. Among these economies, India and China are undoubtedly taking a leading role in both economic and political spheres. India and China's bilateral trade experienced fluctuations in recent years. In 2021, trade between the two nations was valued at approximately USD 125.62 billion, increasing by 8.47 percent to US\$ 136.26 billion in 2022. China was India's third-largest trading partner as of 2022-23. In terms of economic indicators, China's gross domestic product (GDP) in 2023 was around US\$ 17.79 trillion with a growth rate of 5.2 percent, contributing 17.86 percent to global GDP, while India's GDP stood at approximately US\$ 3.57 trillion with a growth rate of 8.2 percent, accounting for 3.37 percent of the world GDP. Ranking 2nd and 5th globally in GDP, respectively, China and India together represent more

than one-third of the world's population, indicating a vast market potential (World Bank, 2025).

China and India represent unrivaled tales of economic growth from a domestic standpoint. Their rapid economic expansion has been closely tied to the surge in trade between the two nations. As two of the world's fastest-growing economies, both countries are expected to play an increasingly significant role in shaping the global economic landscape in the years to come (Sachs, 2003). Both economies are experiencing rapid growth and intimidation of the global community. The rise of these two Asian titans has sparked extensive economic literature examining its implications for the global economy. However, much remains to be explored regarding India-China relations, which this research aims to address across various dimensions. With the growing popularity of Jim O'Neill's BRIC name, Russia formalized the BRIC summit by inviting the foreign ministers of Brazil, India, and China, aiming to bolster their collective international influence. In light of this, the present study aims to analyze Indo-China trade, assess their past performance and explore future trade prospects.

The trade relations between China and India are of great importance since they are regarded as one of the most important bilateral relationships in the world economy. China has been India's main import supplier for the last fifteen years, and Chinese imports are essential to the country's industrial sector. India's trade deficit with China is substantial and still growing. By 2024, it may exceed \$100 billion. China can manufacture items more cheaply than India thanks to its extensive industrial base. Through import substitution and free trade agreements (FTAs) with Asian nations, India has attempted to lessen its reliance on China. Yet, China's proportion of India's imports has grown over time. India shipped US\$15.3 billion worth of goods to China in 2022, primarily consisting of iron ore, refined petroleum, and crustaceans. India needs to identify a clear path to reduce its trade deficit with China. This study will assist in finding that path by looking at the trends and patterns of India's trade with China. Additionally, the analysis of export and import intensity will help determine key sectors where India should focus to enhance its trade balance. The study will also assess India's gains from trade with China, which will demonstrate how much India is benefited

from trading with China. Furthermore, it will identify the commodities in which India holds a comparative advantage over China, providing valuable insights into India's trade potential and opportunities for export expansion in the Chinese market.

Objectives of the Study

The present study specifically seeks to address the following key objectives

- To examine the trends and patterns of India's trade with Chinese economy.
- To estimate the extent of trade intensity between India and China.
- To investigate India's gains from trade with China.
- To identify the potential commodities for future trade between India and China.

Literature Review

David Ricardo's theory of comparative advantage, developed in the early nineteenth century (Ricardo, 1817), along with the new trade theories that emerged in the late twentieth century (Helpman and Krugman, 1985; Krugman, 1979; Kunst and Marin, 1989), form the foundational roots of modern export theory. Classical economists, like Ricardo, emphasized that the primary driver of economic progress is not international trade itself but rather the specialization it enables, which generates greater economic efficiency and rewards. This principle remains central to understanding the benefits of trade and its role in fostering economic growth. Mahlawat (2018) studied the trade patterns between India and other BRICS nations using the Trade Intensity Index (TII) for the period 2006-2015. The study found that South Africa and Brazil had higher-than-expected trade volumes, while India's trade intensity with BRICS, particularly China and Russia, remained below expectations and showed a continuous decline. Sarin (2018) studied India-ASEAN trade relations and found that factors like GDP, population, common language, and trade openness positively influenced trade, while distance had a negative impact. Kiani et al. (2018) examined the factors affecting Pakistan's rice and cotton trade and found that

production, GDP, population, and common borders positively influenced trade, while distance had a negative effect. Uddin and Khanam (2017) examined Bangladesh's trade deficit, highlighting significant imports of goods such as rice, oil, and fertilizer. Their analysis revealed a positive relationship between government expenditure, exports, and GDP. However, the causality between imports and GDP was negative and insignificant, while inflation exhibited a positive but statistically insignificant relationship with GDP. Panda et al. (2016) observed that both India and China trade predominantly with neighboring countries. India's trade was impacted more by its partners' higher GDP and lower per capita income, while China's trade was affected by its partners' higher per capita income. Ghose et al. (2019) observed that while China's exports are almost entirely concentrated in manufacturing products, India's exports have shifted primarily to intermediate goods. Taneja et al. (2015) observed that India's trade deficit with China has substantially expanded with the increase in bilateral trade. Wani and Dharmi (2016) pointed out that despite the remarkable bilateral trade expansion the widening gap in India's trade deficit with China remained a severe issue. Srivastava et al. (2021) analyzed India-China trade performance during the COVID-19 pandemic and found that the consistency of Chinese merchandise exports was greater than that of India during the pandemic. Singh (2016) analyzed recent trends in the volume and composition of BRICS countries' foreign trade, with a focus on both intra-BRICS and extra-BRICS trade. The findings highlighted China's significant dominance in intra-BRICS trade, holding a major share in both imports and exports. Renjini and Kar (2016) analyzed India-ASEAN agricultural trade during 1995-2014 and found India's strong competitiveness in agricultural exports and high trade intensity, particularly with Vietnam, Indonesia, and Thailand. Kocourek (2015) examined the comparative advantage of BRICS nations from 1995 to 2013, highlighting a shift toward more sophisticated merchandise. The study found that China dominated in sectors such as electronics and defense, raising concerns among its trading partners about market competitiveness and dependency. According to Khan and Ahmad (2017) India and China engage in more inter-than intra-industry trade and are more competitive than complementary trading partners. However, Li (2018) observed that their trade

structure is characterized by a fair degree of competitiveness and complementarity.

Although extensive research has been conducted on India's bilateral trade with various countries, including China, relatively few studies have specifically focused on the dynamics of India-China trade relations. Existing literature largely examines overall trade patterns but lacks a detailed assessment of trade intensity, India's comparative advantages, and sector-specific trade opportunities. Therefore, it is essential to analyze the impact of trade between the two nations and propose policy measures to address the growing trade imbalance.

Research Methodology

The present study is entirely based on secondary data and covers an 18-year period from 2006 (marking the emergence of BRICS) to 2023. The study aims to provide a comprehensive analysis of India-China trade dynamics. A set of 10 SITC digit-1 level commodity groups has been selected based on their significance in India-China trade. The trade composition is assessed using various indices, including the Revealed Comparative Advantage (RCA) index, the Revealed Import Dependency (RID) index, and India's gains from trade is measured through Net, Gross, and Income Terms of Trade. Moreover, the extent of trade is evaluated using the Export Intensity Index (EII), Import Intensity Index (III), and an analysis of trade share.

Bilateral Trade between India and China

India-China bilateral trade diplomacy is shaped by a complex interplay of geopolitical tensions and commercial interests. Despite a significant expansion in trade, China remains one of India's largest trading partners, while India continues to face a substantial trade deficit. India's top exports include pharmaceuticals and textiles, whereas its major imports comprise machinery and electronics. However, ongoing border disputes and political tensions have strained relations, prompting India to impose restrictions on Chinese goods and investments, citing national security concerns. Notwithstanding these obstacles, both nations continue to engage in dialogue aimed at addressing trade imbalances and strengthening cooperation, particularly

in sectors such as technology and renewable energy. The future of their trade relationship will largely depend on their ability to navigate political differences and identify mutually beneficial economic opportunities.

India's Export-Import Trade Share with China

Trade share refers to the percentage of a country's total trade with a specific partner. It is calculated by comparing the dollar value of trade between two countries to the total global trade of the country in question. A larger trade share denotes a better level of integration among the trading nations. Table 1 shows that India's export share with China is very volatile during the study period. It was maximum in 2010 with 4.67 percent and minimum in 2022 with only 1.95 percent. China's share in India's total import showed a consistent increasing trend from 2006 to 2015, except for a slight decline in 2009. After 2015, it showed a continuous declining trend. The highest import share was recorded in 2015 at 13.24 percent, while the lowest was in 2006 at 6.88 percent throughout the study years.

Table 1: India's Export-Import Trade Share with China (%)

Year	Export Share	Import Share
2006	3.96	6.88
2007	4.03	8.15
2008	3.65	9.58
2009	3.71	8.31
2010	4.67	9.19
2011	4.27	9.76
2012	3.32	9.17
2013	3.07	9.75
2014	2.83	11.01
2015	2.32	13.24
2016	2.04	12.61
2017	2.51	12.36
2018	3.04	11.52
2019	3.26	11.35

2020	3.79	11.50
2021	3.40	11.50
2022	1.95	11.40
2023	2.09	11.91

Source: Calculated based on data from World Development Indicators

Trade Intensity Index

Trade intensity index (TII) is an important method of measuring bilateral trade flows. It measures the intimacy of a country's trading relationship with other country. It was popularized by Kojima (1964). TII is divided into two types, viz., Export intensity index (EII), and Import intensity index (III). Following Kojima (1964), and Drysdale and Garnaut (1982), the EII and III are stated as follows,

$$EII_{ij} = (X_{ij} / X_{iw}) / (X_{wj} / X_{ww}) \dots\dots\dots(1)$$

$$III_{ij} = (M_{ij} / M_{iw}) / (M_{wj} / M_{ww}) \dots\dots\dots(2)$$

Where, X_{ij} is country i 's export to country j , X_{iw} is the value of export by country i to world, X_{wj} and X_{ww} denote world's export to country j and the rest of the world, respectively. M_{ij} is country i 's import from country j , M_{iw} is the value of import by country i from the world, M_{wj} and M_{ww} denote world's import from country j and from the rest of the world, respectively..

Table 2 reveals that India's EII with China remained below one throughout the study period, indicating that expected export trade was less than the actual trade. This suggests that India's export relationship with China is not very intensive. The EII declined consistently from 0.65 in 2006 to 0.50 in 2009, saw a slight increase in the following year, and then declined again until 2016. Comparing India's recent export intensity with the emergence of BRICS, it is evident that India's exports to China have not grown significantly enough to reduce its trade deficit or move toward a trade surplus country. The III of India with China remained above one for most of the study years, indicating a strong and attractive import trade relationship. India's actual imports from China exceeded expected levels, peaking at 1.19 in 2015, compared to 0.84 in 2006, the year BRICS was established. From 2013 to 2019,

India's import trade with China was particularly intensive, as the III remained consistently above one. However, import intensity declined in 2020 and 2021 due to the COVID-19 pandemic, which significantly disrupted international trade. Following the reopening of economies, India's III rebounded to above one, signaling a recovery in trade relations.

Table 2: Trade Intensity Index of India against China

Year	Export Intensity Index	Import Intensity index
2006	0.65	0.84
2007	0.62	0.94
2008	0.56	1.10
2009	0.50	0.91
2010	0.57	0.93
2011	0.51	1.03
2012	0.39	0.94
2013	0.35	1.00
2014	0.32	1.09
2015	0.27	1.19
2016	0.24	1.14
2017	0.27	1.12
2018	0.32	1.06
2019	0.34	1.06
2020	0.37	0.98
2021	0.33	0.97
2022	0.21	1.00
2023	0.23	1.10

Source: Calculated based on data from Direction of Trade Statistics

India's Gains from Trade with China

Terms of trade (TOT) is used to measure India's gains from trade with China. The TOT is one of the most important tools to measure the gains from trade. Various concepts of TOT have been given by different economists depending on their different works. The present study considers the following three types of TOT.

Net Barter Terms of Trade (NBTT)

NBTT is defined as the ratio of export price index to import price index. It is calculated as

$$NBTT = \frac{\text{Price Index of Export } (P_x)}{\text{Price Index of Export } (P_m)} \times 100$$

Gross Barter Terms of Trade (GBTT)

GBTT is the ratio between import quantity index and export quantity index. A higher value of GBTT for any country indicates more favorable trade conditions for that country. Symbolically, it is expressed as

$$GBTT = \frac{\text{Quantity Index of Import } (Q_m)}{\text{Quantity Index of Export } (Q_x)} \times 100$$

Income Terms of Trade (ITT)

The ITT considers both price and quantity changes, providing a clear picture of whether trade is favorable or unfavorable for a country. It is expressed as

$$ITT = NBTT \times \text{Quantity index of Export } (Q_x)$$

A TOT value greater than 100 indicates that trade between two countries has been favorable, resulting in significant gains. Conversely, a value below 100 suggests unfavorable trade conditions, resulting in minimal gains or even losses in that specific year.

Table 3 shows India's gains from trade with China and that of China's with India over the period 2006-2023. From this calculation, it is evident that India's NBTT has been better than China's throughout the study period. China's NBTT remained below 100, while India exceeded this value in the years 2016, 2017 and 2020. In 2016, India benefited the most from trade with China, as its NBTT reached its highest value of 104.99, indicating that the price of overall exports was higher than the price of imports. Improvements in NBTT for commodities are generally seen as enhancing a nation's economic welfare, as they enable domestic goods to be sold at higher export prices while allowing foreign

goods to be imported at lower prices. This, in turn, provides consumers with access to a wide range of goods and improves their standard of living.

Table 3: India's Gains from Trade in Comparison to China

(Base: 2015 = 100)

Year	NBTT		GBTT		ITT	
	India	China	India	China	India	China
2006	83.87	94.87	81.88	104.90	41.94	48.55
2007	79.88	93.88	81.31	99.57	45.77	57.58
2008	79.89	88.82	87.71	95.23	53.56	59.12
2009	92.99	96.62	96.66	109.46	58.63	57.59
2010	91.49	86.99	94.34	104.22	72.50	66.42
2011	88.10	83.82	90.01	104.20	80.26	69.62
2012	88.14	86.17	96.94	103.48	78.85	75.57
2013	90.45	87.12	89.13	104.14	87.76	82.87
2014	91.82	89.59	87.79	101.50	93.58	90.10
2015	100.00	100.00	100.00	100.00	100.00	100.00
2016	104.99	99.78	97.89	102.24	106.76	101.20
2017	100.40	94.34	100.71	104.03	109.24	102.43
2018	95.62	91.40	100.49	106.32	107.82	103.33
2019	97.97	92.71	97.21	104.30	114.35	106.87
2020	103.17	98.46	93.07	106.36	106.65	116.72
2021	91.00	89.12	89.38	97.61	115.43	123.99
2022	81.33	89.45	96.78	102.97	105.46	121.06
2023	87.55	90.21	97.03	102.98	117.44	126.65

Source: Calculated based on data from World Development Indicators

China's GBTT is more favorable than India's, as China consistently has a GBTT value above 100 in most of the study years, except for 2007, 2008, and 2021. In contrast, India's GBTT is below 100 in almost all years, except for 2017 and 2018. This trade pattern suggests that, in order for India to import a certain amount of goods from China, it must export more to China, indicating unfavorable trade conditions for India. On the other hand, China enjoys a more advantageous position, as its GBTT value remains

above 100, reflecting a more favorable trade scenario for China. The ITT reflects the purchasing power or import capacity of a country, based on its exports to a trade partner. The ITT values of both India and China have been quite similar, with both exceeding 100 after 2015. However, China has had greater purchasing power in recent years, as its ITT value reached 126.65 in 2023, while India's ITT stood at 117.44, indicating that China has had a stronger ability to import goods compared to India.

Analysis of Trade Potential between India and China

Trade potentiality between two countries at commodity level can be assessed by the Revealed comparative advantage (RCA) index, and the Revealed Import Dependency (RID) Index. These indices can be expressed as follows

$$RCA_{ij} = \frac{(X_{ij} / X_{it})}{(X_{wj} / X_{wt})} \dots\dots(3)$$

$$RID = \frac{(M_{ij} / M_{it})}{(M_{wj} / M_{wt})} \dots\dots(4)$$

Where X_{ij} is the export of commodity j by country i , X_{it} is the total export of commodity j by country i , X_{wj} is the world's export of commodity j and X_{wt} is the world's total export of all commodities. M_{ij} is the import of commodity j by country i , M_{it} is the total import of commodity j by country i , M_{wj} is the world's import of commodity j and M_{wt} is the world's total import of all commodities.

The RCA and RID indices are calculated over an 18-year period, from 2006 to 2023. The average values are provided to offer a clear overview of the commodities having potential for future trade between India and China. By comparing the RCA and RID of different commodities, it becomes easier to identify commodities that are either complementary or competitive in nature between the two countries.

Table 4: Mean RCA and RID Values for India and China (2006-2023)

For India				For China			
SITC	Products	RCA Value	RID Value	SITC	Products	RCA Value	RID Value
1	Beverages and tobacco	0.093	0.631	1	Beverages and tobacco	1.176	0.034
2	Crude materials, inedible, except fuels	1.449	1.323	2	Crude materials, inedible, except fuels	1.413	1.538
3	Mineral fuels, lubricants, & related materials	0.333	0.746	3	Mineral fuels, lubricants, & related materials	0.8673	0.091
4	Animal & vegetable oils, fats, & waxes	3.088	0.360	4	Animal & vegetable oils, fats, & waxes	0.122	2.595
5	Chemicals & related products, n.e.s.	0.766	3.576	5	Chemicals & related products, n.e.s.	3.842	0.681
6	Manufactured goods	0.855	1.048	6	Manufactured goods	1.447	0.981
7	Machinery & transport equipment	0.312	1.769	7	Machinery & transport equipment	1.867	0.327
8	Miscellaneous manufactured articles	0.245	0.917	8	Miscellaneous manufactured articles	1.294	0.231
9	Commodities n. e. s.	0.329	1.238	9	Commodities n. e. s.	0.451	0.362

Source: Calculated based on data from WITS

Table 4 illustrates how India and China's competitive positions and import dependencies vary significantly across product categories, reflecting their distinct economic structures and trade

profiles. The table displays the RCA and RID values for India and China from 2006 to 2023 across nine product categories. RCA values indicate the relative competitiveness of a country in exporting a specific product, while RID values highlight the country's reliance on imports of that product. For India, Animal and vegetable oils, fats, and waxes stands out with the highest RCA value of **3.088**, suggesting a strong export advantage in this category, while **Beverages and tobacco** has the lowest RCA of **0.093**, indicating a comparative disadvantage. In terms of RID, India is most dependent on imports for **Chemicals and related products n.e.s** (RID value of **3.576**), whereas it has a moderate import dependency for Machinery and transport equipment (RID value of **1.769**).

For China, **Chemicals and related products n.e.s** shows the highest RCA value of **3.842**, indicating China's significant export advantage in this sector, while Animal and vegetable oils, fats, and waxes has a very low RCA of **0.122**, reflecting a comparative disadvantage. China's **RID values** reveal that it is highly dependent on imports for Crude materials, inedible, except fuels (**1.538**) and **Mineral fuel/lubricants** (**0.091**), but less dependent on **Beverages and tobacco** with a low RID of **0.034**.

Table 5: Commodities with Trade Potential between India and China (2006-2023)

RCA value > 1 for India and RID value > 1 for China				RCA value > 1 for China and RID value > 1 for India			
SITC Code	Products	RCA of India	RID of China	SITC Code	Products	RCA of China	RID of India
2	Crude materials, inedible, except fuels	1.449	1.538	2	Crude materials, inedible, except fuels	1.413	1.323
				5	Chemicals & related products, n.e.s.	3.842	3.576
4	Animal & vegetable oils, fats, & waxes	3.088	2.595	6	Manufactured goods	1.447	1.048
				7	Machinery & transport equipment	1.864	1.769

Source: Calculated based on data from WITS

Table 5 identifies the commodities with trade potential between India and China based on their RCA and RID values from 2006 to 2023. The first section highlights products where India has a comparative advantage ($RCA > 1$) and China has high import reliance ($RID > 1$). These commodities include Crude materials, inedible, except fuels and Animal and vegetable oils, fats, and waxes, where India is competitive in exports and China is heavily reliant on imports, suggesting a potential for increased trade from India to China in these sectors. The second section of the table identifies commodities where China has a comparative advantage ($RCA > 1$) and India has high import dependence ($RID > 1$). These products include **Crude materials, inedible, except fuels, Chemicals and related products n.e.s, manufactured goods, and Machinery and transport equipments**, where China is well-positioned as an exporter while India relies on imports, indicating that India could benefit from increased imports of these goods from China. Overall, the table shows the potential areas of trade where both countries could mutually benefit, with India exporting raw materials and agricultural products to China, while China could supply manufactured goods, chemicals, and machinery to India.

Conclusion

The trade relationship between India and China has shown notable volatility and imbalance throughout the study period. India's export share to China peaked at 4.67 percent in 2010 and declined to 1.95 percent by 2022. Similarly, while India's import share from China grew consistently from 2006 to 2015, reaching a high of 13.24 percent, it has seen only a slight decrease since then. India's export intensity index with China has remained below one, indicating that the actual exports are less than expected, suggesting a less intensive trade relationship. In contrast, the import intensity index has generally been above one, particularly from 2013 to 2019, showing a stronger import trade relationship, which weakened temporarily due to the COVID-19 pandemic but improved thereafter. Regarding terms of trade, India's Net Barter Terms of Trade consistently outperformed China, with India benefiting from more favorable prices on exports compared to imports. However, China's Gross Barter Terms of Trade were generally more favourable, indicating that India had to export

more to afford imports from China. The Income Terms of Trade revealed similar purchasing power for both countries, though China had a higher ITT value, indicating stronger purchasing power in recent years. India's comparative advantage ($RCA > 1$) in sectors like crude materials and animal fats, where China has high import reliance ($RID > 1$), suggests potential for increased exports from India to China. Conversely, in sectors where China has a comparative advantage, such as chemicals, machinery, and manufactured goods, India could benefit from increased imports from China.

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