

# Bilateral Trade Analysis of India and Brazil

*Anshita Banga\**

Brazil and India are important economic and geopolitical partners. This article studies the trends of exports and imports from India to Brazil, the composition of exports and imports, opportunities of China+1 in the Brazilian Market, sectoral opportunities and threats concerning the trade relationship with Brazil, trends of trade complementarities and intensity, intra-industry trade and services and investment relationship. The article concludes that exports to Brazil are driven by the growth of few products and its composition is not vastly different from what is exported to the World. China+1 has immense opportunity but India seems to be losing competitiveness in those products. Textiles and Chemicals have huge opportunities while Footwear and Agriculture face threats. Intra-industry trade between the two is not strong enough. Trade Intensity has grown much more than the growth in trade complementariness. Brazil is a net services importer country while India is a net services exporting country.

**Keywords:** Brazil, India, Revealed Comparative Advantage, Trade Intensity, Trade Complementarities

**B**RAZIL is the 10<sup>th</sup> largest economy in the world and the largest in Latin America. Latin America is an important region for India to assume leadership of the Global South. Brazil is India's 20th trading partner. India is Brazil's 5<sup>th</sup> most important trading partner. Brazil is one of the few countries with which India has a current account surplus. Others are the USA, UK and Netherlands. Brazil is the only BRICS nation with which India has a current account surplus. In a span of four years from 2018 to 2022 India's exports to Brazil have increased from \$3,800 million to \$9,919 million growing by 2.6 times. Exports to Brazil have grown at a higher rate than imports from Brazil. Figure 1 shows exports and imports to Brazil from 2018 to 2022. Figure 2 shows the Current Account Balance of India with Brazil. The surge in Brazilian

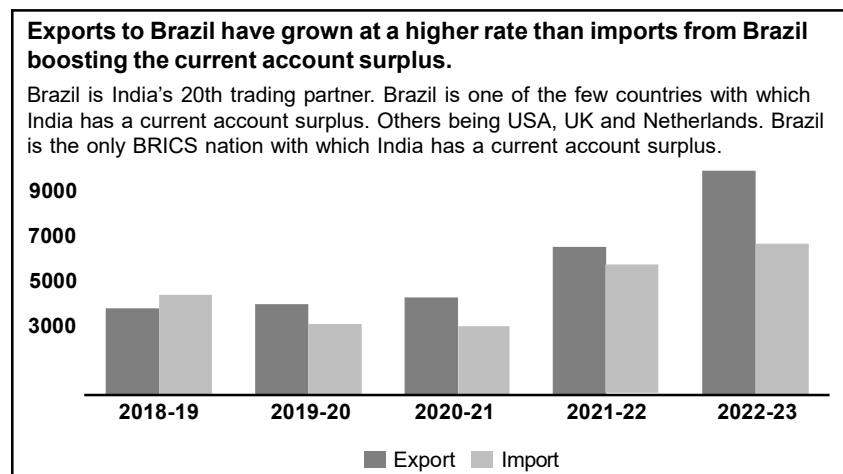
imports is driven by imports of specific commodities. When the top 15 Brazilian imports from India (India's exports to Brazil) in 2022 are analyzed, the median growth is 22.5 per cent which is much less and at comparable terms with Brazil's import growth of 24.9 per cent. Brazil's import growth has been driven by Refined Petroleum products (Figure 3). Therefore, one can say that Indian exports to Brazil have witnessed a normal Brazilian import surge and have not discovered a magical booming market. Brazil's imports have grown at a time when the major parts of the World were struggling through the repercussions of the War and the pandemic as it is a major commodity exporter and therefore witnessed favourable Terms of Trade. The trade indicators have been reflections of domestic economic scenarios. When a country experiences favourable Terms of Trade it means that the relative price of exported goods has risen. This causes trade balances to

improve and puts upward pressure on that currency, appreciation of a currency leads to cheaper imports and increased import demand. The top 15 Indian exports to Brazil makes up 50 per cent of all exports to Brazil. These are chemicals, pharma-ceuticals and Refined Petroleum products.

China is Brazil's largest import destination (Figure 4). India is Brazil's 5th largest trading partner. The volume of Indian Exports to Brazil is less than 15 per cent of that of Chinese Exports to Brazil. Figure 5 shows that China exports more tech-based products to Brazil and India exports more Resource based and primary products to Brazil. In medium-tech products, India appears to have some potential. India is a much more trusted partner than China. Brazilian policy wants to look away from China as they hold cheap Chinese manufacturing exports as a possible reason for the re-prizatization of their economy. It is uncertain if they would like to

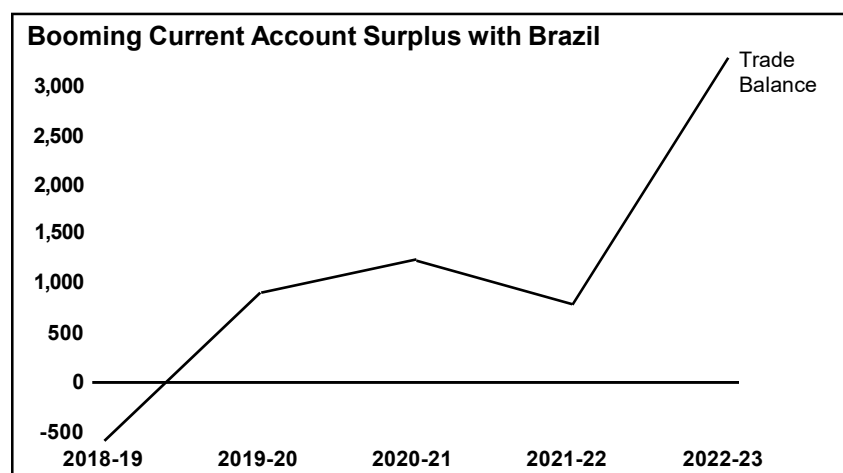
\* Student, M.A. Economics, Second Year, Indian Institute of Foreign Trade, New Delhi.

**FIGURE 1**  
**EXPORTS AND IMPORTS TO BRAZIL**



Source: Department of Commerce • Created with datawrapper

**FIGURE 2**  
**CURRENT ACCOUNT SURPLUS WITH BRAZIL**



Source: Department of Commerce • Created with Datawrapper

welcome another emerging economy to its markets which has aspirations of reviving its manufacturing sector. Also, the other major question is whether India has the potential and the ability to take on China's place in Brazil. Should it try to take China's place and how can it achieve that?

India's export mix to Brazil seems vastly different from that of China's export mix. The study finds China's biggest export items to Brazil

and India's Revealed Comparative Advantage in them and how that advantage has progressed or diminished from 2018 to 2022.

The Balassa Index of Revealed Comparative Advantage (RCA) indicates those industries in which a given country may have a comparative advantage. The standard calculation of revealed comparative advantage measures how much a country is exporting a given good relative to its total trade,

in comparison to the share of that good in world trade. Country *i* is said to have a "revealed comparative advantage" in a good when the share of that good in its exports is bigger than the share of that good in world exports.

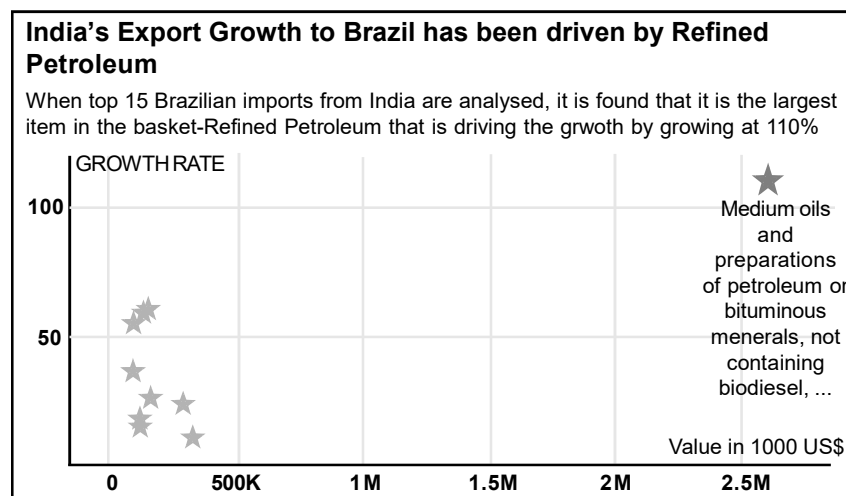
The revealed comparative advantage (RCA) is calculated as:

$$RCA_{iw}^k = \left( \frac{x_{iw}^k}{X_{iw}^k} \right) / \left( \frac{x_{ww}^k}{X_{ww}^k} \right) \quad (\text{Eq. 1})$$

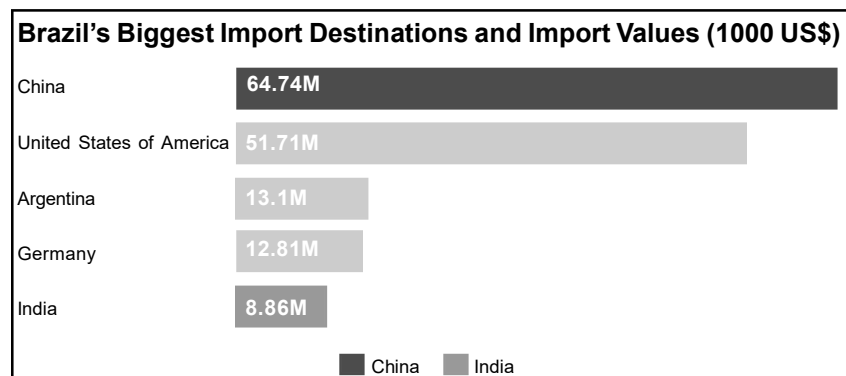
A value higher than 1 represents an advantage.

Top Chinese exports to Brazil are taken from ITC TRADE MAPS for 2022. India's comparative advantage is calculated for these products for the years 2018 and 2022 using WITS at HS 2 Level. Figure 6 shows that India has a comparative advantage in Chemicals, Mineral Fuels, Textiles, Rubber and Leather products and Iron & Steel but most of the items have experienced a loss in competitiveness from 2018 to 2022 including chemicals, textiles and leather products. Only mineral fuels (Russia-Ukraine War), Rubber and Iron & Steel products have improved their competitiveness. Some of the major Chinese exports in which India has a comparative disadvantage are Vehicles, Plastics, Nuclear Reactors, Electrical Machinery, Furniture, Toys, Fertilizers and Medical Devices. In electrical machinery, India has reduced its disadvantage but a long road remains to turn into an advantage. India definitively has an opportunity to pitch itself as an alternative to China but a focused Industrial Policy is needed to increase the competitiveness.

**FIGURE 3**  
**REFINED PETROLEUM EXPORT GROWTH**



**FIGURE 4**  
**BRAZIL'S IMPORT DESTINATIONS**



Product categories like textiles have enormous potential as India even has a bilateral advantage within them and they are major employment-generating sectors. The electrical goods sector has improved its productivity. PLI's can be advantageous and more PLIs can be looked into in these sectors. Despite the political narrative, the toys segment has failed to improve its productivity. The World Bank President Ajay Banga has also claimed that India has a 3-5 year window to tap the opportunities of China+1 while businesses modify

their supply chains. China+1 seems to be a big opportunity but this opportunity seems to be ticking away fast in the Brazilian Market.

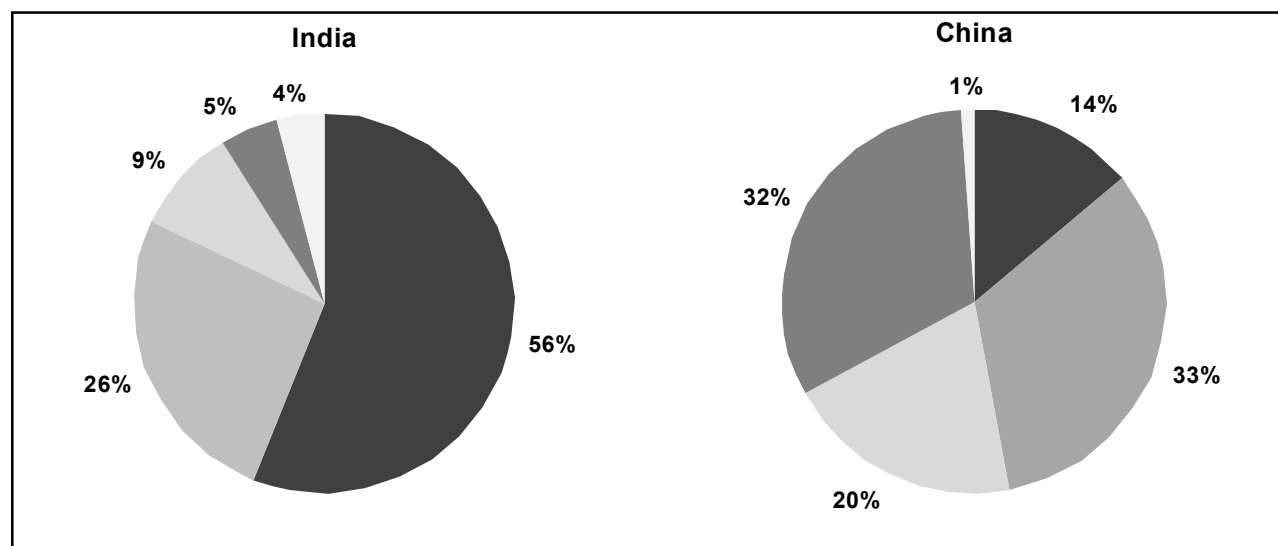
Indian Exports to Brazil have become much more resource-based and this has been a secular trend since 2020. India's Exports to Brazil are much more resource-based in comparison to the World but when primary products and resource-based products are taken together as a category and technology-based products as another category, one can reach conclude that India's export mix to Brazil is not very different from

its exports to the World (Table 1). The World and the Brazil data have been taken for the year 2022.

Soyabean oil is India's biggest import from Brazil. The top 15 Indian Imports from Brazil make up 85 per cent of total Indian Imports from Brazil. When these products are studied, they have been classified into two categories depending on whether Brazil has enough production capacity to satisfy complete Indian import demands. India can increase the import of goods in which Brazil has excess capacity and in which Brazil has a small share in the import basket of India. Iron ore, copper ore, ferrous compounds, cotton and pepper are a few such goods. The demand for such metals depends more on the level of the manufacturing ecosystem rather than the price sensitivity. Lowering domestic tariffs on inputs might serve as a better policy. If lowering tariffs on industrial inputs is not politically feasible, then FTAs with resource-rich nations can be looked into as a second-best policy but for many of these products, tariffs are already low. If trade diversification emerges as a source of gain, then import gains can be a possibility for the sake of boosting resilience but no other country is a single source supplier of most of Brazilian commodities which leads us to the conclusion that trade diversion will surmount trade diversification.

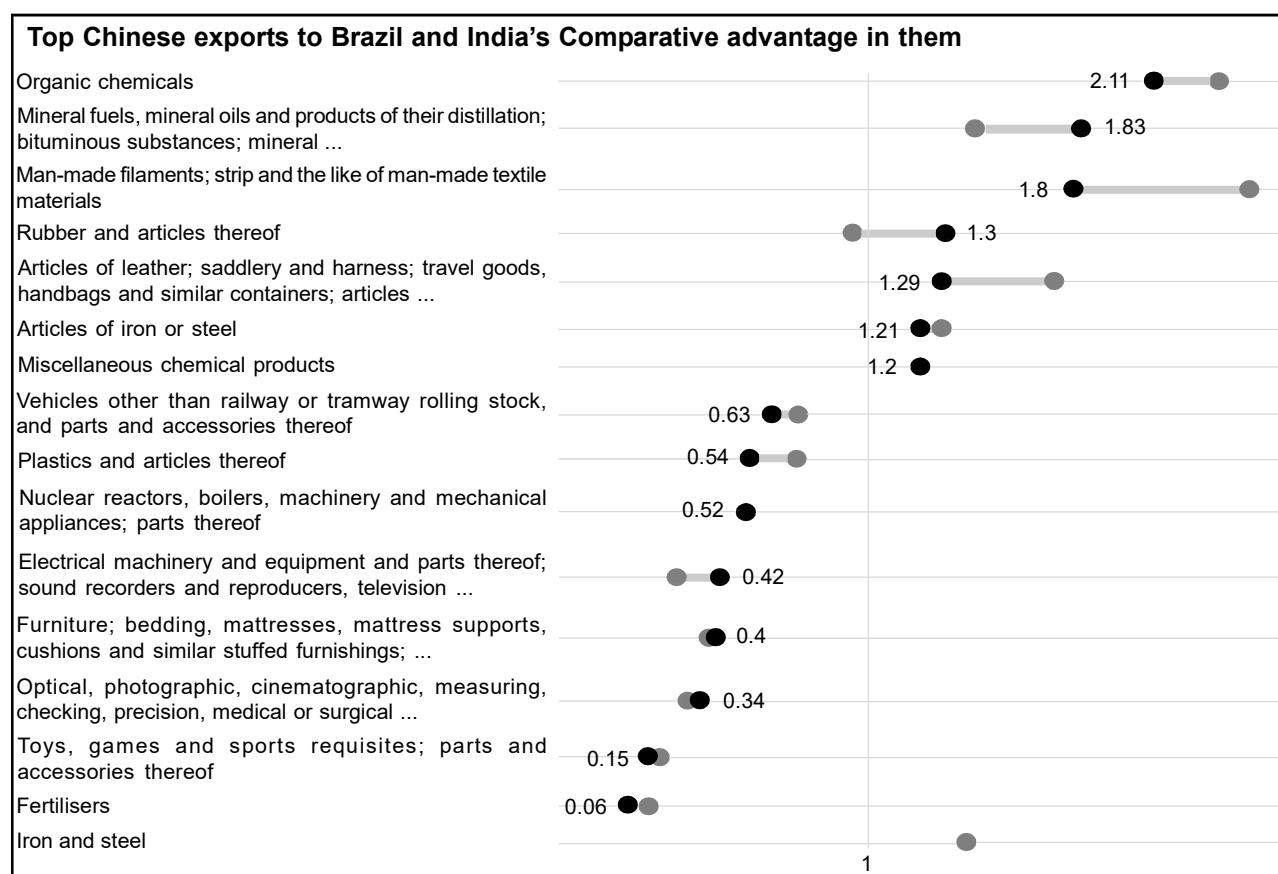
Indian Imports from Brazil have seen a rise in the share of Primary Products. Most of the imports fall in the category of either Resource-based Products or Primary Products (Table 2). India still exports some low and medium-tech products to Brazil, though its

**FIGURE 5**  
**TECHNOLOGICAL CLASSIFICATION OF INDIAN AND CHINESE EXPORTS**



Source: ITC Trade Map • Created with Datawrapper.

**FIGURE 6**  
**INDIA'S COMPARATIVE ADVANTAGE IN CHINESE EXPORTS TO BRAZIL**  
INDIA'S RCA 2018 INDIA'S RCA 2022



Source: WITS UN COMTRADE, ITC TRADE MAP • Created with Datawrapper.

**TABLE 1**  
**TECHNOLOGICAL CLASSIFICATION OF EXPORTS**

India's Exports to Brazil	2018	2019	2020	2021	2022	India's Exports to World	China's Exports to Brazil
High Tech	0.07	0.06	0.08	0.04	0.05	0.07	0.32
Low Tech	0.23	0.17	0.16	0.15	0.09	0.2	0.2
Medium Tech	0.32	0.41	0.45	0.39	0.26	0.19	0.33
Primary Prods	0.05	0.04	0.06	0.05	0.04	0.13	0.01
Resource Based	0.33	0.31	0.26	0.37	0.57	0.42	0.14

Source: WITS UN COMTRADE.

**TABLE 2**  
**TECHNOLOGICAL CLASSIFICATION OF BRAZIL'S EXPORTS**

India's Imports from Brazil/ Brazil's Exports to India	2018	2019	2020	2021	2022	Brazil's Exports to World
High Tech	0.01	0.02	0.01	0.01	0.01	0.02
Low Tech	0.03	0.03	0.02	0.01	0.01	0.04
MediumTech	0.11	0.11	0.07	0.07	0.07	0.14
Primary Prods	0.44	0.47	0.53	0.64	0.6	0.48
Resource Based	0.42	0.36	0.37	0.26	0.31	0.32

Source: WITS UNCOMTRADE.

**TABLE 3**  
**ANALYSIS OF THREATS AND OPPORTUNITIES**

Products	Bilateral Advantage	Revised Comparative Advantage with World
01-05_Animal	0.05	1.64
06-15_Vegetable	0.42	1.79
16-24_FoodProd	0.26	0.63
25-26_Minerals	0.22	0.91
27-27_Fuels	0.66	1.42
28-38_Chemicals	2.38	1.46
39-4_PlastiRub	0.58	0.77
41-43_HidesSkin	0.34	1.62
44-49_Wood	0.33	0.36
50-63_TextCloth	2.30	2.68
64-67_Footwear	0.40	1.09
68-71_StoneGlas	1.34	2.98
72-83_Metals	1.24	1.18
84-85_MachElec	0.37	0.37
89-89_Transport	0.49	0.71
90-99_Miscellan	0.58	0.23

Created with Datawrapperr.

Source: WITS UN COMTRADE.

share has fallen. Brazil is practically unable to export any tech-based products to India. Brazil can export a few tech-based products to the rest of the World but has failed to export or increase the share of tech-based export products to India.

## Standard RCA

The Balassa Index of Revealed Comparative Advantage (RCA) indicate those industries in which a given country may have a comparative advantage. The standard calculation of revealed comparative advantage measures how much a country is exporting a given good relative to its total trade, in comparison to the share of that good in world trade. Country *i* is said to have a “revealed comparative advantage” in a good when the share of that good in its exports is bigger than the share of that good in world exports.

The revealed comparative advantage (RCA) is calculated as:

$$RCA_{iw}^k = \left( \frac{x_{iw}^k}{X_{iw}^k} \right) / \left( \frac{x_{ww}^k}{X_{ww}^k} \right) \quad (\text{Eq. 2})$$

## Bilateral RCA

The BRCA1 uses as a denominator the exports of a selected comparator country - country *j*. Hence in this case the RCA is calculated by comparing the share of exports of country *i* to the world, to the share of exports of country *j* to the world. The indicator then becomes a bilateral RCA and shows the products for which country *i* has revealed comparative advantage, concerning country *j*. The formula is:

$$BRCA_{iw}^k = \left( \frac{x_{iw}^k}{X_{iw}^k} \right) / \left( \frac{x_{jw}^k}{X_{jw}^k} \right) \quad (\text{Eq. 3})$$

Both the indexes have been sourced from the WITS platform and are for the year 2020.

If a product has an advantage in a good world market, and that advantage is either strengthened or remains close in the bilateral market, this means that there is a strong competitive advantage in that market (Table 3).

If a product has an advantage in the world market but that changes to a disadvantage in the bilateral market, this means that industry faces a threat from a foreign country.

India has a comparative advantage with Brazil in the following categories:

- (1) Chemicals
- (2) Textiles and Clothing
- (3) Stone and Glass
- (4) Metals

In chemicals, India has a higher comparative advantage with Brazil than with the rest of the world. Removal of Non-Tariff Barriers and better certification can increase its exports. In textiles and clothing, India has a lower comparative advantage with Brazil than with the rest of the world, yet a significant opportunity to tap. Both are developing economies and clothing is a sector in which Paul Krugman's intra-industry trade comes into play even if Brazil strengthens its domestic sector. If properly advertised and given favourable domestic scenarios with lower tariffs, this labour-intensive industry can bring favourable gains for India. This industry and its potential need to be examined. PLI scheme possibility can also be looked into in this matter. The footwear industry is likely to emerge as a loser.

Industry talks are needed to realize what actions can minimize the losses for this industry. Agriculture is a sensitive industry that stands to lose. Brazil has an incentive to try and gain access to this market. It has in the past also advocated along with the EU to liberalize agricultural markets of developing countries. This is likely to emerge as one of the most contentious issues in promoting Bilateral Trade between the two. The complementarity index (Table 4) is a type of overlap index. It measures the degree to which the export pattern of one country matches the import pattern of another. A high degree of complementarity is assumed to indicate more favourable prospects for a successful trade arrangement. A value above 50 shows that Trade is Complementary. The trade intensity index (Table 5) is used to determine whether the value of trade between two countries is greater or smaller than would be expected based on their importance in world trade. A value above 100 indicates that two countries are trading with each other beyond their weight in the global economy. TII has always been high in Brazil and has continued to increase. It seems like the gains from trade have already been exhausted.

Trade that takes place within an industry is known as Intra Industry Trade. It is when an automobile exporting country buys certain other automobiles from another country. This arises due to economies of scale and love for variety. It is an important form of trade between Developed and Developed countries or between an emerging and emerging economy. 'Grubel-Lloyd Index (GLI)'- The index measures Intra-industry trade as that percentage of the country's

total trade which is balanced, that is, exports equal imports. The value of the index lies between 0 (no IIT – trade is one-way) and 100 (complete IIT). According to the original version of GLI, for an individual product group or industry  $i$ , GL Index is calculated as:  $GLI_i = [(X_i + M_i) - |X_i - M_i|] \cdot 100 / (X_i + M_i)$ , where  $X_i$  = exports of industry  $i$ ; and  $M_i$  = imports of industry  $i$ . Formula  $GLI_j = \{[(\sum(X_i + M_i) - \sum |X_i - M_i|)] \cdot 100 / \sum(X_i + M_i)\}$  refers to the average level of IIT for a country  $j$ , where  $i$  is the  $i$ th of  $n$  industries (GLI India). India and Brazil do not share an important relationship in intra-industry trade despite being emerging economies. A weak manufacturing sector in both economies might be a plausible clause. The value of the index stands at 38 which is a very weak level of intra-industry trade. Some of the important products in which there is a strong intra-industry trade

**TABLE 4**  
**TCI INDEX**

Year	TCI
2018	59.69
2019	60.22
2020	59.12
2021	60.09
2022	63.09

**Source:** WITS UN COMTRADE.

**TABLE 5**

Year	Trade Intensity Index
2017	137.59
2018	141.76
2019	152.56
2020	176.62
2021	184.13
2022	219.16
2023	219.19

**Source:** WITS UN COMTRADE.

Relationship are Agricultural products, Defence products, Tobacco products, Tea & coffee, and Footwear. Marketing is crucial for these products to survive in the other market. Both India and Brazil are emerging economies with weak manufacturing sectors and strong services sectors. In the Brazilian economy, the Service Sector is an even bigger employer when compared to India. Services Sector is the biggest employer in Brazil (69%) while Agriculture is the biggest employer in India (44%). Brazil's agriculture is highly productive while India's services are highly productive. Despite that, Brazil is a Net Services Importer and also has a services deficit with India (Figure 7). India's

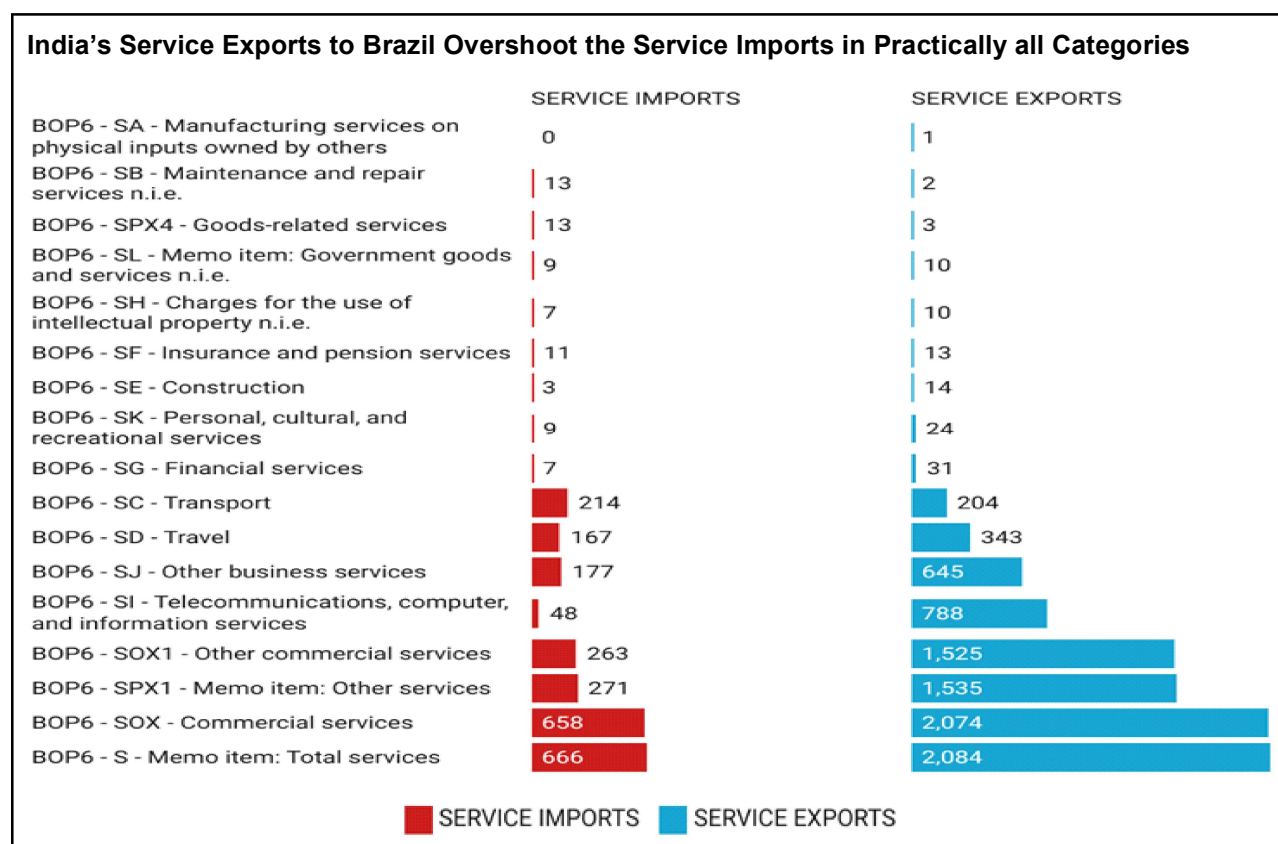
services sector is much more productive than Brazil's services sector. Both countries have large youth populations but India's productivity is better than Brazil's. As a result, strong competition from Indian IT and GCCs is a huge threat to Brazil. This makes services trade between the two politically sensitive. India has a great performance concerning services sector and might get better trading partners than Brazil which has higher growth potential. Both India and Brazil do not have much investment in each other beyond some big news headline items. India's share in Brazil's total FDI stands at 1.20 per cent (Bank of Brazil).

## Conclusion

Brazil and India are important geopolitical and economic partners. Trade complementarity between the two has grown but that has been accompanied by an increase in trade intensity which raises apprehension regarding the future gains that can be generated from this relationship. Both economies are developing but are different from each other. India has a goods deficit but a services surplus while it is the opposite case with Brazil. India's services sector is much more productive. For Brazil, the services sector is the biggest employer. Brazil has its own set of economic problems ranging from low productivity to corruption. Mega

FIGURE 7

### INDIA'S SERVICE EXPORTS AND IMPORTS TO BRAZIL



Source: WTO2019 • Created with Datawrapper.

demand from Brazil is unlikely to be the case. In such a case, Indian services can become a huge threat to the Brazilian Economy but that still might not be a huge opportunity for India. India exports resource-based and medium tech-based products to Brazil and imports primary products. India's export mix to Brazil is not very different from the World but Brazil has failed to export tech-based products to India, though it can export some of it to the Rest of the World. India's CAS with Brazil is driven by few products. China+1 has enormous potential but India has lost comparative advantage in most of the biggest Chinese exports to Brazil. Chinese export mix to Brazil is very different from India's export mix to Brazil.

Pharma and chemical space stand to gain from improved trade relationships. Exploration of products beyond top categories is vital to make full use of opportunity. Textiles and clothing have a potential market in Brazil. If properly encouraged, it may bring good wins for Indian manufacturers. Also, it is a major employment generator. The footwear industry is likely to emerge as a loser. Industry talks are needed to realize what actions can minimize the losses for this industry. This sector can gain from marketing as there is significant intra-industry trade. Agriculture is a sensitive industry that stands to lose. Brazil has an incentive to try and gain access to this market. It has in the past also advocated along with the EU to liberalize agricultural markets of developing countries. This is likely to emerge as one of the most contentious issues in this relationship. Brazil has an enormous demand for fertilizers. India is a

fertilizer-importing country. It can think of building domestic capacity and building a turnaround story from importer to exporter. Brazil does not emerge as a source of diversifier for any country on which India is hugely dependent.

Both countries do not share an important relationship from the perspective of Investment or Technology transfer. FTA with Brazil is unlikely to pose any threat to macroeconomic stability. Despite both being emerging economies, both are not significant intra-industry trade partners. This is likely as the relationship is based on raw products rather than manufacturing prowess and economies of scale. Brazil has in recent times become an import supplier of Crude Oil, the World's 8 largest. It can produce oil profitably at a cheap price but Latin American Countries have failed to channel them into proper investments in Gulf countries. The world is trying to move away from Oil. In the future, Brazil might be hurt by the resource curse. This can compound Brazil's problems and not let it be a strong market. Also, it will be against Brazilian's interests to do an FTA with a major consumer because, in such a kind of future, an export tax on its resources might be more favourable. Also, India has been able to find Lithium Reserves within the country. Detailed studies on all resources and their futuristic uses are needed.

At the end, domestic manufacturing growth is what empowers export growth more than just FTA deals.

#### **Conflict of Interest**

The author declare that they have no conflicts of interest.

#### **REFERENCES**

1. Bedi, P. (2016), Revealed Comparative Advantage and Trade Specialisation: The Case of India, *FOCUS: Journal of International Business*, 3(2). <https://doi.org/10.17492/focus.v3i2.7867>
2. Fen, S., and Latif, E. (2014), Bilateral Trade Between China and Canada: Trends, Patterns, and Comparisons, *Asian-Pacific Economic Literature*, 28(2), November, pp. 77-87. <https://doi.org/10.1111/apel.12074>
3. Handique, C. (2020), An Empirical Analysis of Interindustry and Intra-Industry Trade between India and ASEAN – The Impact of Revealed Comparative Advantage (RCA) in Commodities, *International Journal of Management*, 11(12), 7 December. <https://doi.org/10.34218/ijm.11.12.2020.013>
4. Ismail, S., and Ahmed, S. (2022), Static and Dynamic RCA Analysis of India and China in World Economy, *International Studies of Economics*, 17(2), July, pp. 228–260. <https://doi.org/10.1002/ise3.18>
5. Mukhopadhyay, A. (2023), Indo-Russian Economic Engagement: Legacy Issues, Dynamic Shifts, and Possibilities for the Future, *MGIMO Review of International Relations*, 16(2), 24 May, pp. 142-158. <https://doi.org/10.24833/2071-8160-2023-2-89-142-158>
6. Sikdar, C. (2006), Prospects of Bilateral Trade between India and Bangladesh, *Foreign Trade Review*, 41(1), April, pp. 27-45. <https://doi.org/10.1177/0015732515060102>
7. Nag, B., and Chatterjee, R. (2009), Bilateral Trade and Investment between India and China, *Foreign Trade Review*, 44(2), July, pp. 33-59. <https://doi.org/10.1177/0015732515090202>