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Trade opportunities in textiles between India and BRICS: A structural share-based analysis

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Abstract

As India adjusts to the changing international trade scenario brought about by the reciprocal tariffs imposed by the U.S. government, there is a need to identify product groups and markets with strong export potential for Indian goods. India is one of the top textile exporters in the world and enjoys an immense comparative advantage in textile exports, as reflected in the high Revealed Comparative Advantage (RCA) Index. BRICS is a grouping of emerging economies, and as of 2025, these countries together accounted for 41 percent of the world population, 24 percent of the total world GDP, and 16 percent of the world trade. We evaluated the trade complementarity between India and the BRICS countries Brazil, Russia, China, and South Africa in textiles from 2001 to 2023 to examine the alignment between India's export specialization and the import needs of these countries. The study found that the trade complementarity index with Russia and South Africa was higher than that with Brazil and China for almost the entire study period. Despite high trade complementarity, the share of Russia and South Africa in India's major exports grew less rapidly than that with Brazil and China. This study provides an approach to identify trade opportunities in textile product groups by combining four key indicators: trade complementarity (supply–demand alignment), growth in the product group's share in India's exports (supply potential), growth in the product group's share in the partner country's imports (demand trend), and growth in the partner's share in India's exports.

Keywords: BRICS, CAGR, RCA Index, TCI, Textiles, HS Code.
JEL Classification: F10; F14.

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Contribution of this paper to the literature

This study examines the shifts in India's export specialization and imports demands from the other members of the BRICS group within the textiles sector over the study period. Unlike earlier studies that rely solely on the Trade Complementarity Index (TCI) and Trade Intensity Index (TII), this study incorporates growth in partner countries' import needs and their evolving share in India's exports to assess trade potential in the textile products group classified at the HS-2-digit level.

1. Introduction

Trade Watch Quarterly, published by NITI Aayog in its July-September 2025 issue, observed that India's textile and apparel exports have remained more or less stagnant over the last six years, whereas, for the world as a whole, exports from this sector grew at an impressive 3.5 percent. Although the revealed comparative advantage index (RCA) for textiles as a whole has ranged between 2.41 and 4.26 (calculated using data from the World Integrated Trade Solution; our unpublished results) during the study period, indicating that the share of textiles in India's exports was significantly higher than the world average, the share of textiles in India's total exports has decreased from 25.28 percent in 2001 to 8.21 percent in 2023. The quarterly report noted that India's textile exports were highly concentrated in natural fibre-based products like cotton and carpet threads. However, global demand has grown for man-made and technical textiles. The share of India's exports of cotton, carpets, and other floor coverings in the total world export of textiles was 12.3 percent, and 10.5 percent in 2023. In contrast, man-made filament-based textiles and man-made staple fibres from India accounted for only 3.3 percent of the world's export of textiles. Therefore, it becomes important to identify product groups within the broad category of textiles where India has a comparative advantage, measured in terms of RCA and the existence of a potential market, as reflected in the high import share of the product group in the destination country, to increase India's textile exports.

Export promotion involves carefully identifying destination countries based on geopolitical considerations and analyzing the product market. Attention must be given to existing competitors and to evaluating the competitive edge in terms of price, quality, and brand value of products. The tariffs and non-tariff barriers imposed by destination countries, as well as whether the two countries are part of a trade bloc, have a significant impact on trade possibilities. Further factors such as production capabilities, prevailing exchange rates, regulatory environment, and economically viable trade routes are all important in determining trade opportunities.

India has entered into many bilateral and regional free trade agreements, including with ASEAN and SAARC member countries. It also has comprehensive economic partnership agreements (CEPA) with Japan, South Korea, Mauritius, the UAE, and a preferential trade agreement (PTA) with the MERCOSUR trading bloc, which includes Argentina, Brazil, Paraguay, Uruguay, and Bolivia as member countries.

In addition, India is also a member of the BRICS group. BRICS is an informal grouping of emerging economies, and according to the latest reports, their combined share of global GDP, measured by purchasing power parity (PPP), exceeds that of the G7 countries. There is a high volume of trade between the various countries of this group. Currently, this group has 10 member countries and 9 partner countries. As most of the countries in this group have experienced high economic growth rates for many years, increased economic cooperation through trade among these countries could further enhance their economic and political standing in the world.

This study examines the trade complementarity in textiles between India and the other four founding members of BRICS. This analysis helps us understand whether India's exports match the needs of each of the other four countries, and by using trade data between India and the destination countries, we infer trade possibilities.

2. Methodology

Using ITC's TRADE MAP, trade data for textiles at the two-digit classification level for the BRICS countries was collected. Textile data are listed under chapters 50 to 63. The share of products covered under a given chapter, in the total textile exports of India, was calculated for all the years from 2001 to 2023 ($x_{50}…x_{63}$). Similarly, for Brazil, Russia, China, and South Africa, the share of chapter-wise products in their total textile imports ($m_{50}…m_{63}$) was calculated for the same period. Using this data, the Trade Complementarity Index between India and the other four member countries of BRICS, namely Brazil, Russia, China, and South Africa, was calculated.

The Trade Complementarity Index between countries i and j in any period t is defined as

$$TCI_{ij,t} = 100\ (1 - \frac{1}{2}\sum_{k=50}^{63} \left|m_{ik} - x_{jk}\right|) \quad (1)$$

Here, m_{ik} refers to the share of product covered under chapter k in the total textile imports of country i in period t, and x_{jk} refers to the share of products of chapter k in the global textile export of country j in period t. When there is a perfect match between the shares, i.e., $m_{ik}=x_{jk}$ for all k, ECI_{ij} is 100. The index becomes zero when products exported by country j are not imported by country i, and products imported by country i are not exported by country j.

To better understand trade complementarity, we compared the shares of chapter-wise products in India's export basket with those of their shares in the import baskets of destination countries. Since neither the export nor the import shares for the fourteen product groups showed any dramatic fluctuations during the study period, we decided to use the average of these shares to make comparisons.

To identify shifts in India's export specialization, changes in market demand, and changes in the relative significance of partner countries in India's foreign trade during the study period of 23 years, we calculated the compound annual growth rate (CAGR) in the share of all chapter-wise product groups in India's global exports, in partner countries' total imports, and also in the share of the partner country in India's exports. The CAGR was calculated using the following formula.

$$CAGR = \left(\frac{relevant\ share\ in\ 2023}{relevant\ share\ in\ 2001}\right)^{1/22} - 1 \quad (2)$$

3. Literature Review

Researchers have used TCI and other trade indicators such as the RCA Index, Trade Intensity Index (TII), and the Trade Similarity Index to evaluate trade possibilities between countries. While some studies examined bilateral trade, others analyzed trade benefits for countries entering into free trade agreements with varying levels of trade complementarity.

Hosein, Boodram, and Saridakis (2023) examined trade complementarity as a basis for the 'Natural Trading Partner Hypothesis'. Using a panel data approach, they found that aggregate trade complementarity and, specifically, manufacturing sector complementarity significantly affected the trade volume of the economy of Trinidad and Tobago during the period 2000 to 2015. Therefore, the authors suggested that countries should be guided by trade complementarity in their choice of trade partners.

Akram, Ahmad, Dana, Khan, and Akhtar (2024) examined the trade between India and Sri Lanka from 1995 to 2020. Despite being part of the South Asian Free Trade Area and having a bilateral free trade agreement, the trade between the two countries was found to be low due to a lack of comparative advantage for the majority of the product groups. Furthermore, in products where the two countries did have a comparative advantage, they were competitors rather than natural trading partners. Tabassum (2021) analyzed the two-way trade complementarity between India and Bangladesh in her paper. The author found that while India's exports had a strong complementarity with Bangladesh's imports, complementarity was weak in the other direction. Further, the ratio of India's exports to Bangladesh to global exports to Bangladesh was higher than expected and significant. Hannafi and Shehu (2016) studied the trade relations between Nigeria and India from 2000 to 2014. The authors reported that the trade complementarity between Nigeria's exports and India's imports, though not very high, increased during the study period.

Another country that has drawn considerable attention from researchers in this area is China. Min, Huang, and Zhang (2016) used the RCA Index and TCI to evaluate possibilities in agricultural trade between China and Belt and Road Initiative countries. The study found that, as complementarity in trade between these countries was more pronounced than competition, it indicated the presence of significant trade potential that could be effectively tapped. Yu and Qi (2015) highlighted the complementarity between China and Central and Eastern European countries in various agricultural products. The authors suggested that China could export more of its aquatic and fruit products, as well as milk and honey. Zhang (2021) used RCA, TCI, and Export Intensity Index to explore the trade relationship between China and Brazil in agricultural products. The study found that, due to differences in resource endowments and the structure of the agriculture sector, the two countries complement each other rather than compete in trade. The study noted that, while China exports labor-intensive processed products like textile fibers, vegetables, and fruits, Brazil's competitive advantage lies in land-intensive products such as oilseeds and vegetable oils. The author thus highlighted that the two countries have significant potential for cooperation and development.

Trade possibilities between the countries of a trading bloc have been the focus of many research studies. Hoang (2018) studied the agricultural trade complementarity of ASEAN countries and found that the export patterns of these countries had relatively less complementarity with regional demand than with the world market as a whole. The author inferred that these countries will benefit more from global integration than regional integration. As the exports from these countries are substitutable over time, it is in the interest of these countries to cooperate and use the internal markets to become more competitive. Noting that countries with complementary trade structures have a greater potential for trade, Chandran (2011) shows that India and ASEAN countries have complementary sectors, and India can increase trade cooperation across all product categories with different members of the ASEAN group. Chandran and Sudarsan (2012) examined the effect of the India-ASEAN free trade agreement on the marine sector and concluded that the apprehension that the agreement would lead to large-scale dumping of marine products in India is unfounded.

Hosein et al. (2023) studied the effect of the FTA between the Caribbean Community (CARICOM) and the EU and North America on trade between these countries. The study reported that intra-CARICOM trade and trade with FTA partners were not noteworthy because trade complementarity was low and concentrated in a few primary industries.

4. Results and Discussions

4.1. TCI Between India and the BRICS Countries

The graph of TCI between India and the other four member countries of BRICS in textiles is shown in Figure 1.

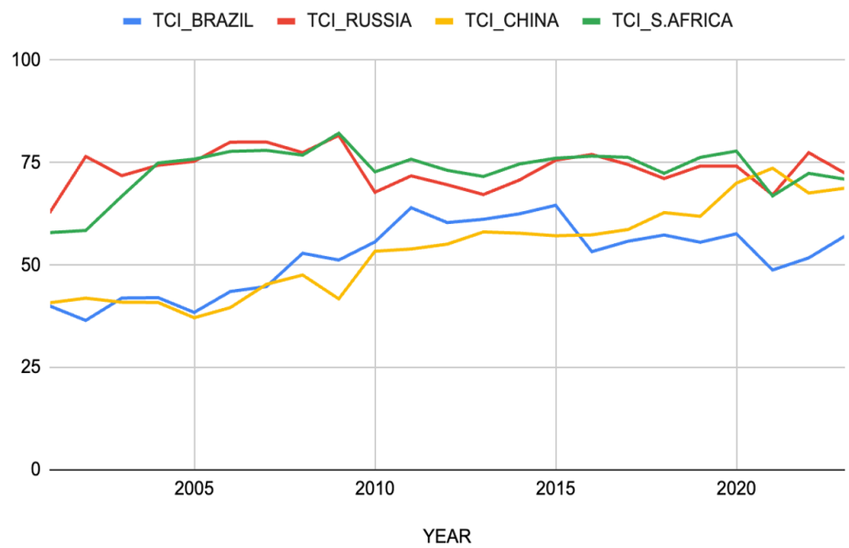

Figure 1. TCI of Brazil, Russia, China, and South Africa with India in textiles.

Figure 1 shows that the trade complementarity between India and the four BRICS countries improved over time. India's export structure in textiles matched better with the import structure of Russia and South Africa than with Brazil and China. The trade complementarity index with Russia was never less than 62.77 and was as high as 81.67 in 2009. The import structure in textiles for South Africa also had great similarity with India's export structure in textiles, and the TCI values ranged between 57.94 and 82.21, with the peak value again in 2009. India's TCI with Russia and TCI with South Africa, in general, moved together, with a slight upward trend from the beginning of 2001 till 2009, and thereafter hovered around 70. The TCI with Brazil showed a marked upward trend, reaching the maximum value of 64.61 in 2015. Since then, the TCI of India with Brazil declined gradually, reaching 48.81 in 2021 and rising to 57.09 in 2023. The trade complementarity index with China, which was below that of the TCI with Russia and TCI with South Africa throughout the study period, surpassed them in 2021 when the value increased to 73.67.

4.2. Comparison of Trade Structures of Countries Based on Average and CAGR of Product Shares

A comparison of the average share of chapter-wise products in total textile exports of India, with their average share in total textile imports of the destination countries, helped us identify product groups with mirror image trade structures in the two countries.

Table 1 reveals that India's export specialization within the textile group was in cotton (HS 52), articles of apparel and clothing accessories knitted and crocheted (HS 61), articles of apparel and clothing accessories not knitted and not crocheted (HS 62), and other made-up textile articles (HS 63). The product groups with an average import share exceeding 10% were HS 54, 55, 61, and 62 for Brazil; HS 61 and 62 for Russia; HS 52 and 54 for China; and HS 61 and 62 for South Africa.

Cotton is one of India's major exports, and the country accounts for 12.3% of the total world exports of cotton. India's RCA index of 6.8 in cotton is the third highest in the world and indicates that, in relative terms, India's exports of cotton are much higher than the world average. The average share of this product in the total textile exports of India for the study period is approximately 20 percent. From the table, it is clear that the country with a large share of imports for cotton is China. The average share of cotton in its total textile imports is 30 percent. However, China also accounts for the largest share in the global export of textiles and is therefore the largest competitor India has to contend with.

India's exports of articles of apparel and clothing accessories, both knitted and crocheted (HS 61) and not knitted or crocheted (HS 62), have a strong complementarity with the imports of Russia, South Africa, and Brazil. For these countries, products covered under HS 61 and 62 constitute a significant share of their total imports. For instance, these products accounted for 24.5 percent and 27.5 percent in Russia's import basket of textiles, and 22.3 percent and 25.3 percent in South Africa's total textile imports, and 10.8 percent and 13.3 percent in Brazil's textile imports from the world.

Table 1 shows the average over the twenty-three-year period of the export share for India and the import share for Brazil, Russia, China, and South Africa for products grouped under the fourteen chapters.

Table 1. Average of shares of product groups in exports and imports of countries.

HS code	$\underline{x}$ INDIA	$\underline{m}$ BRAZIL	$\underline{m}$ RUSSIA	$\underline{m}$ CHINA	$\underline{m}$ S AFRICA
HS 50	0.01033	0.00242	0.00057	0.00363	0.00192
HS 51	0.00471	0.00433	0.00626	0.09867	0.01329
HS 52	0.20133	0.06679	0.08843	0.30721	0.07629
HS 53	0.01129	0.00567	0.00613	0.02504	0.00767
HS 54	0.06179	0.28213	0.05070	0.11938	0.09733
HS 55	0.05338	0.15033	0.06835	0.09696	0.08163
HS 56	0.00938	0.04933	0.05078	0.03538	0.03567
HS 57	0.05108	0.01446	0.02213	0.00358	0.01629
HS 58	0.01008	0.02133	0.01687	0.02242	0.01783
HS 59	0.00683	0.06283	0.03983	0.05708	0.05171
HS 60	0.00792	0.05938	0.04257	0.06225	0.04821
HS 61	0.19683	0.10875	0.24530	0.06500	0.22317
HS 62	0.24583	0.13333	0.27578	0.09246	0.25379
HS 63	0.12925	0.03896	0.08617	0.01142	0.07492

Note: $\underline{x}$ refers to the average of the export share of the relevant product group in India's exports
$\underline{m}$ refers to the average of the import share of the relevant product group in the partner country's imports.

The trade complementarities between different countries for the identified product groups diminish when analyzed using CAGR in the corresponding shares. Table 2 shows that the share of products covered under chapters 51, 54, 55, 56, 59, 60, 61, and 63 in India's total exports increased during the study period. Due to the high growth rate in shares of products covered under chapters 56, 59, and 60, India's textile export composition shifted towards these products. Conversely, the other four countries either moved away from importing these products or experienced slow growth in import demand, resulting in only a small increase in the TCI of India with all four countries over time.

To examine the effect of shifts in trade complementarity on bilateral trade between India and the other BRICS countries, we analyzed the CAGR in the share of each partner country in India's exports of various products. Table 2 indicates that during the twenty-three-year study period, China's share in India's exports increased across all product groups except those falling under the HS 58 category. Brazil also emerged as a significant trading partner, with its share in India's exports increasing in eleven product categories. Russia and South Africa, however, experienced growth in export share for only five textile cluster categories. For products covered under chapter 56, a high growth rate in their shares of India's total exports positively influenced bilateral trade with the other four countries. The other two product groups, HS 59 and 60, which gained importance in India's export basket during the study period, registered increased exports with only two of the four countries.

Table 2. CAGR in shares of product groups in exports and imports of countries.

HS code	g_x India	g_m Brazil	g_m Russia	g_m China	g_m S Africa	g_p Brazil	g_p Russia	g_p China	g_p S Africa
HS 50	-8.81%	-4.66%	0.00%	-3.62%	-5.85%	-10.84%	-10.24%	15.90%	-15.57%
HS 51	0.97%	-10.55%	-9.11%	-0.99%	0.00%	-4.66%	4.53%	1.10%	-4.86%
HS 52	-0.24%	-6.06%	-6.74%	2.24%	-5.41%	5.94%	-15.59%	5.81%	-2.93%
HS 53	-0.32%	-0.67%	-12.02%	4.52%	-1.09%	1.63%	-0.38%	22.47%	-1.41%
HS 54	0.17%	-2.38%	-1.75%	-4.56%	-3.67%	7.78%	4.89%	5.01%	-1.84%
HS 55	0.57%	1.35%	-1.82%	-5.50%	-3.61%	6.94%	1.65%	5.48%	2.02%
HS 56	6.21%	-0.53%	-3.03%	1.84%	0.24%	10.12%	2.70%	18.00%	2.55%
HS 57	-0.16%	-0.79%	-2.80%	1.78%	-2.45%	5.37%	12.81%	9.07%	2.11%
HS 58	-2.35%	0.00%	-5.14%	-5.64%	-2.97%	12.04%	-5.30%	-5.85%	-4.49%
HS 59	5.60%	-1.28%	-0.22%	-2.16%	-2.20%	20.44%	-5.90%	18.78%	-1.34%
HS 60	6.58%	3.33%	0.45%	-5.38%	-0.08%	-8.64%	-26.04%	3.75%	5.18%
HS 61	0.60%	5.54%	6.55%	6.85%	4.98%	10.02%	-15.90%	17.65%	3.12%
HS 62	-1.25%	3.15%	3.95%	6.14%	3.52%	7.01%	-9.71%	13.91%	-2.05%
HS 63	1.85%	3.47%	-0.18%	7.69%	1.47%	4.72%	-0.54%	1.69%	-0.72%

Note: gx refers to CAGR in the share of the product in India's global exports.
gm refers to CAGR in the share of the product in the partner country's imports from the world.
gp refers to CAGR in the share of the partner country in India's export of the product.

4.3. Identifying Trade Possibilities

With a high average value of export shares over the study period, products falling under chapters 52, 61, 62, and 63 were identified as India's major textile exports. The RCA index for all these product groups in 2023 (as reported by 'Trade Watch', July-September FY 2025) was 6.8, 1.3, 1.7, and 3.8, respectively. The RCA indices imply that the share of these products in India's total exports was greater than the corresponding share for the world. We therefore examined India's export performance in these products relative to the import demands. The CAGR of export share (g_x), import share (g_m) of all four countries, and the partner country's share in India's exports (g_p) helped us identify trade possibilities.

Cotton (HS 52), which had the second-highest average share in India's textile exports, gradually lost its preeminence, as reflected in the negative growth rate of 0.24 percent. Interestingly, except for China, the other three countries were also moving away from cotton imports. For Brazil and South Africa, though the share of cotton in total imports from the world declined, their share in India's export of cotton increased. In contrast, Russia seems to have lost its importance as a market for Indian cotton exports. China, however, continued to grow as an important market for cotton, and its share in India's exports grew by 5.81 percent.

Share of articles of apparel and clothing accessories knitted and crocheted (HS 61) in India's exports grew at a very low rate of 0.6 percent. The share of this product in total imports of textiles by the other four countries of BRICS increased at high rates, ranging from 4.98 percent for South Africa to 6.85 percent for China. Brazil and China's shares in India's exports grew by 10.02 percent and 17.65 percent, respectively, while that of Russia declined by 15.90 percent. This could be a missed opportunity for India, as Russia's import needs were growing at a CAGR of 6.55 percent.

A similar trend appears to be emerging for products classified under HS 62. Once again, although the significance of articles of apparel and clothing accessories not knitted and not crocheted in India's export basket was decreasing, demand for these products increased across all BRICS countries, resulting in a higher share of imports from the global market for these items. Additionally, India's exports were increasingly targeted towards Brazilian and Chinese markets. For this group of products, both the Russian and South African markets became less significant for Indian exporters.

The share of other made-up textile articles, sets, worn clothing, and worn textile articles, rags (HS 63) in India's exports increased over time. The importance of this cluster of products in the import baskets of Brazil, China, and South Africa increased during the study period. High and positive g_p values (CAGR in the share of a country in India's export of this product) for Brazil and China, and negative g_p values for Russia and South Africa indicate that Indian exporters were selling more to Brazilian and Chinese importers and were moving away from the Russian and South African importers.

5. Conclusions

In this paper, trade complementarity is analyzed at the HS 2-digit classification level, not only in terms of average import share and export share of products falling under HS codes 50 to HS 63, but also in terms of CAGR in these shares. Thus, our analysis is dynamic and captures the shift in export specialization and import requirements over the study period. Furthermore, while similar studies have used TCI and Trade Intensity Index (TII) to discern trade possibilities, we have used growth in import needs and growth in the shares of partner countries in India's exports to draw inferences regarding trade possibilities given the TCI with these countries.

A high TCI reflects a good match between exporting countries' product specialization and importing countries' needs. The logical outcome would then be higher trade between countries with high TCI than with low TCI countries. India's trade complementarity with Russia and South Africa was higher than that with Brazil and China for the majority of the twenty-three-year period studied. However, this study found that the positive relationship between trade complementarity and trade levels did not hold for bilateral trade between India and the other BRICS countries.

India's export specialization, as measured by average export shares, appears to be concentrated in products covered under chapters 52, 61, 62, and 63. Countries with high import ratios in similar product groups include China for HS 52 and Russia, South Africa, and Brazil for HS 61 and HS 62. The average share of HS 63 products in the total imports of these four countries was less than 10 percent. The shares of Brazil and China in India's exports of all four product groups increased significantly over the study period. Since China was also importing cotton heavily, it can be inferred that Indian exporters effectively capitalized on trade opportunities. By increasing exports to Brazil,

Indian exporters successfully leveraged trade complementarity, particularly in articles of apparel and clothing accessories, both knitted and crocheted (HS 61) and not knitted or crocheted (HS 62).

Surprisingly, Russia and South Africa, despite having an import product concentration complementing India's export specialization, were becoming less important for Indian exporters for these product groups. This could be a result of a large number of factors, including but not limited to tariffs and non-tariff barriers, competitiveness in terms of price and quality, etc. Without exploring each of the possible reasons, it is, however, difficult to make a conclusive inference.

Product groups that registered a significant increase in export share during the study period fall under chapters 56, 59, and 60. The share of India's exports with each of the four countries increased for the HS 56 group of products, although the growth rate in shares was small for Russia and South Africa compared to the other two countries. Brazil and China became more important for Indian exports of HS 59 products. Exports of HS 60 products increased by a small percentage to Chinese and South African markets.

Various reports indicate that bilateral trade with Russia holds significant potential and is expected to improve in the coming years. With the International North-South Transport Corridor (INSTC) becoming an economically viable trade route, the cost of transporting goods between India and Russia will decrease, leading to increased trade between the two countries.

As regards South Africa, since India's trade focus is more on East Africa, targeted programmes would be needed to take advantage of the high trade complementarity between the two countries.

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