

Trends in Indo-Sweden Bilateral Trade: An Analysis Based on Trade Intensity Approach

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Abstract

Sweden and India are two dynamic nations with unique economic structures, trade policies, and industrial landscapes that play pivotal roles in the global market. This paper aims to elucidate the robust and promising bilateral trade relations between India and Sweden, employing the Trade Intensity Index as a critical analytical tool to unveil the potential benefits of strengthening these ties. The study spans from 2004 to 2023, providing a rich historical context for thoroughly assessing evolving trade trends and patterns. Utilising secondary data sources, we meticulously analyse fluctuations in trade volumes and spotlight the profound impacts of economic and policy shifts on these relationships. We have harnessed the power of Microsoft Excel, applying its advanced data processing capabilities to ensure the utmost accuracy and reliability of our findings. We rigorously scrutinised trade dynamics between our nations using various statistical tools, particularly the independent t-test for hypothesis testing. These analyses reveal significant insights, suggesting a notable decline in both export and import intensities over the examined period. However, rather than view this as a setback, it presents an opportunity for strategic policy intervention. Our study offers valuable insights, encouraging policymakers to explore innovative avenues to revitalise and enhance future trade relations between India and Sweden, ultimately contributing to mutual economic prosperity.

Keywords

Bilateral Trade, Trade Intensity, India-Sweden Trade, Export, Import, Trade Relations, International Trade

1. Introduction

India and Sweden established diplomatic relations in 1949, laying the foundation for a partnership based on shared democratic values and economic cooperation (Embassy of India, 2023). The primary focus of this relationship with Sweden in the early decades was development cooperation. Providing financial and technical support to India's developing industries. Sweden's facilitation of technology transfers during this time was essential to India's industrialisation and investments in critical sectors. The 1990s saw a dramatic shift in India-Sweden relations that mirrored India's economic growth and its opening up to and integration into the global economy. As both nations saw the potential, this shift led to a bilateral focus on trade and investment for cooperative economic efforts. Important multinational companies from Sweden, including SKF and Ericsson, increased their presence in India. Taking advantage of prospects in the automotive and telecommunications industries.

Meanwhile, Indian IT and pharmaceutical companies leveraged their advantages to gain a foothold in Sweden's Strategic location as a gateway to the European Union (Embassy of India, 2023). Over time, trade between Sweden and India has shifted from specific industries to trade in services and products. Sweden historically exported most of its products to India, including paper, machinery, and automobile parts. In Sweden's healthcare sector, information technology services, alongside renewable energy, have recently changed the trade composition. Sweden's growing demand in these industries reflects global market trends and India's shift in Sweden's market share. (Swedish Embassy 2023). Recent trade statistics clearly show that trade is becoming more diverse. In 2022, Swedish exports to India amounted to approximately SEK 17.3 billion, with key commodities including machinery, paper, and steel (Sweden Abroad, 2022).

Meanwhile, India's exports to Sweden were valued at around US\$953.79 million in 2023, comprising machinery, electrical equipment, apparel, and vehicles (Trading Economics, 2023). These figures underscore the evolving economic landscape and the complementary nature of both economies. To further strengthen economic ties, both nations have undertaken strategic initiatives and high-level engagements. These include official visits, policy dialogues, and participation in business summits. A notable example is the Swedish Prime Minister's participation in India's 'Make in India' initiative in 2016, which highlighted the collaborative efforts to enhance industrial cooperation (Wikipedia, 2023). Such engagements have facilitated discussions on regulatory frameworks, investment policies, and ease of doing business between the two countries. Despite growth trends, challenges remain in the India-Sweden trade relationship. Trade volumes have fluctuated over time, particularly during the COVID-19 pandemic in 2020, which caused a temporary decline. However, by 2021, trade began to recover, with Swedish exports to India increasing by 50% in 2022 and imports from India rising by 43% during the same period (Sweden Abroad, 2022). Addressing non-tariff barriers, streamlining

regulatory standards, and enhancing trade logistics will be essential to sustaining and expanding bilateral trade. This study systematically evaluates the factors influencing India-Sweden trade relations by analysing trade intensity indices and bilateral trade frameworks.

This study examines significant aspects, including the Indian quantum trade relationship analysis, trade trends, and economic outcomes with Sweden. The most important part of the analysis is the evaluation of India's trade intensity with India and the difference in Sweden's trade intensity with India, which helps understand the importance of relative power and exports between the two countries. In addition, this study aims to evaluate the inequality of the import-intensive index between the two countries. It aims to shed light on how each country depends on other countries for income. In assessing these factors, this study provides insights into trade dynamics, potential growth areas, and the general economic interdependence between India and Sweden. By addressing these objectives, this research seeks to provide a strategic roadmap for enhancing India-Sweden economic relations.

2. Review of Literature

Research on trade interactions between India and Sweden remains limited. However, to gain insights into this topic, several studies on India's trade with other countries have been reviewed. These studies have been organised into distinct sections to enable a thorough and detailed exploration.

2.1 India-Sweden Relations

Singh (2023) provides a historical overview of the bilateral relations between India and Sweden. It emphasises the deep-rooted connections and the potential for a robust partnership on the international stage. The study highlights the political and economic complementarities that have shaped the relationship over time.

Eriksson & Ehn (2023) provide an in-depth analysis of trade dynamics between India and Sweden, focusing on factors influencing bilateral trade, including foreign direct investment (FDI), education levels, and exchange rates. It highlights that India's primary imports from Sweden include machinery, iron and steel, electrical equipment, paper, and vehicles. The research also notes that over the past decades, global imports of Swedish goods have significantly increased, with India being a key partner in this growth.

2.2 India-China Trade Relations

Raghuramapatrani (2014) conducted an in-depth analysis of the trade relationship between India and China, revealing that India has significantly higher values for both TII and T'II, which indicates a strong dependency on China as a major trade partner for both exports and imports. In contrast, China shows lower values, suggesting that it maintains trade relationships with a more diversified set of partners and is less reliant on India. Furthermore, an RCA analysis conducted by Raghuramapatrani (2014) identified that out of the twelve service categories assessed, five were found to be feasible for trade between the two nations. Paswan (2021) further examined trade intensity and found that the India-China trade relationship is heavily imbalanced, necessitating strategic policy interventions to correct the trade asymmetry. Bhattacharya et al. (2007) explored the impact of a potential Free Trade Agreement (FTA) between India and China, concluding that while the FTA would initially favour China due to India's high tariff structures, over time, as tariff levels align, India could benefit more significantly.

2.3 India-Gulf Trade Relations

Das and Pradhan (2014) analysed the structure and intensity of trade relations between India and the Gulf Cooperation Council (GCC) countries. Their study found that India has a strong export intensity with the UAE, Saudi Arabia, Iran, Kuwait and Oman, demonstrating their importance as key export destinations. However, in Bahrain and Qatar, India's export intensity has been inconsistent, and its import intensity from these countries remains low, suggesting lower import volumes. Further studies by Mohajeri (2015) and Alam et al. (2017) reinforced that the UAE has emerged as India's most significant trade partner in the Gulf region. Goyal (2016) elaborated on the mutually beneficial nature of the India-UAE trade, which is dominated by petroleum, mineral fuels, gems and jewellery, clothing, cereals, and mechanical appliances. Alam (2015) emphasised the growth in trade between India and Saudi Arabia, particularly after the "Delhi Declaration" and the adoption of India's "Look West Policy." However, the trade composition remains concentrated in a few traditional sectors.

2.4 India's Trade with Other Nations

India-Korea-Vietnam Trade: Kien et al. (2010) examined trade relations between Korea and Vietnam using trade indices such as TII, IIT, RCA, and TCI. Their findings showed that Vietnam predominantly exports low-technology manufacturing goods and primary products, where it enjoys a comparative advantage. Meanwhile, Korea specialises in technology-intensive exports, making the trade structure complementary rather than competitive.

India-New Zealand Trade: Bano and Paswan (2016) examined trade between India and New Zealand over 24 years and found that trade relations between the two nations have moderately strengthened. However, despite some progress, bilateral trade remains below its potential due to structural and policy constraints.

India-Sri Lanka Trade: Garg (2018) analysed trade relations between India and Sri Lanka from 1991 to 2015. The study found that India had an RCA greater than 1 for several products, indicating a comparative advantage. However, Sri Lanka lacked a comparative advantage in exporting to India, leading to an asymmetric trade relationship.

India-Malaysia Trade: Khalid and Ismail (2020) examined trade relations between India and Malaysia and found that trade intensity between the two nations is relatively high. Their study showed that intra-industry trade in manufactured goods is significant, indicating a well-integrated trade pattern between India and Malaysia.

India-BRICS Trade: Maryam & Mittal (2019) examine India's trade flows with BRICS countries from 2001–2015 using BRCA, TCI, and the gravity model. Findings indicate India holds a comparative advantage in agriculture and manufacturing, with minimal structural changes over time. High TCI values suggest strong trade potential, while GDP and population significantly impact trade flows. The gravity model confirms that distance remains a major constraint to India's trade with BRICS.

India-Bangladesh Trade: Basu and Datta (2007) analysed Bangladesh's persistent trade deficit with India, attributing it to similarities in exports and high trade competitiveness. Their study recommended policy measures to enhance trade diversification and address the structural constraints leading to the trade imbalance.

India-Pakistan Trade: Khan (2013) investigated India-Pakistan trade relations and found that Pakistan enjoys a comparative advantage in the textile and garment sector. However, it faces relative disadvantages in the automotive, chemical, and steel industries. The study suggested activating the SAFTA (South Asian Free Trade Agreement) and expanding the list of sensitive commodities to boost trade between South Asian countries.

India-Japan Trade: Sundar (2014) examined India's trade relations with Japan and noted a lack of diversification in India's exports to Japan. Over time, the proportion of Japanese imports from India has declined, indicating a weakening trade intensity.

India-New Zealand Trade: Bano (2010) noted that, despite an increase in trade volume, bilateral trade between India and New Zealand remains significantly lower than expected compared with their respective global trade patterns.

India-USA Trade: In his study, Kumar Ravi (2018) examined India's trade relationship with the United States. In particular, the research highlights an unfavourable trend with an increasing trade imbalance over time. Moreover, the imbalance has been positively skewed in India's favour, meaning that India has been exporting more than it has been importing from the US. Additionally, he focused on the growing trade deficit between India and the US, noting that it has reached unprecedented levels and has serious repercussions for the overall economy.

3. Methodology

Quantitative research techniques are utilised in this study to achieve its goals. It examines Sweden's and India's trade and economic ties, focusing on the exchange of significant goods, and assesses the Trade Intensity Index (TII). The study reviews bilateral trade flows between India and its primary importing nations to determine how India's exports compare with the overall imports of specific goods in these markets. It further explores the trade potential between India and Sweden to evaluate the likelihood of Indo-Swedish trade relations. Several techniques have been developed to measure trade levels between two trading nations. Kojima (1964) and Srivastava and Green (1986) pioneered the concept of trade intensity indexes. Given their significance in international trade, these studies examined whether trade volumes between two nations were higher or lower than expected. Frankel (1997) later developed an index to assess trade intensity within regional trading blocs, determining whether a region exports a greater share of its goods to a specific destination than the global average (Folfas 2010). This study employs Kojima's (1964) Bilateral Trade Intensity Index (BTII) to analyse the trade relationship between Sweden and India. The UN COMTRADE statistics database, covering the years 2004-2023, provided the data for the analysis. The study examines the potential for expanding Indo-Swedish trade by estimating export and import intensities for both countries. The Trade Intensity Index (TII) calculates the percentage of a nation's total share of international trade that comes from trade with another.

3.1 Trade Intensity Index:

The Trade Intensity Index (TII), which gauges the strength of trade relations between two nations, is based on actual bilateral trade flows. An essential consideration for exporters when choosing target markets is a higher TII value, which denotes a stronger trade relationship and increased export potential. By dividing the percentage of a nation's exports to a particular partner by the rate of global imports aimed at that partner (P), the TII is computed. The Trade Intensity Index ranges from 0 to 1 (or, if expressed as a percentage, 0 to 100). An absence of trade between two nations is indicated by a TII value of 0, while a strong trade relationship is indicated by a TII value of 1 (or 100). If the import intensity index is greater than 100, it suggests that India imports more goods from Sweden than would be expected, given Sweden's share of world trade. On the other hand, India imports less than anticipated, if it is less than 100. Comparably, in exports, a TII value of 0 denotes little trade linkage, while a value close to 100 denotes significant trade activity. Given Sweden's

significance in international trade, a value greater than 100 suggests that India exports more to Sweden than anticipated (Sundar 2014).

a. Export Intensity Index of India's Trade with Sweden:

$$XII_{ist} = [X_{is} / X_i] / [M_s / (M_w - M_i)] * 100$$

This specification defines India's Export Intensity Index (XII) about its trade with Sweden. The variables are interpreted as follows XII_{ist} represents India's export intensity index with Sweden, X_{is} refers to India's exports to Sweden, X_i denotes India's total exports, M_s signifies Sweden's total imports, M_w represents total global imports, and M_i accounts for India's total imports. The analysis covers the period from 2004 to 2023. A value greater than 1 for this index indicates that India's share of exports to Sweden is higher than Sweden's share of imports from the rest of the world. This suggests that Sweden holds a prominent position in India's export market. When expressed as a percentage (1 to 100), a value exceeding 100 signifies a greater export intensity, implying that India exports to Sweden at a disproportionately higher rate compared to Sweden's overall import patterns.

b. Import Intensity Index of India's Trade with Sweden:

$$MII_{ist} = [M_{is} / M_i] / [X_s / (X_w - X_i)] * 100$$

The MII_{ist} represents India's Import Intensity Index about its trade with Sweden. The variables are defined as follows: MII_{ist} refers to India's import intensity index with Sweden, M_{is} denotes India's imports from Sweden, M_i signifies India's total imports, X_s represents Sweden's total exports, X_w accounts for total global exports, and X_i represents India's total exports. The analysis covers the period from 2004 to 2023. A value exceeding 1 (or 100 when expressed as a percentage) indicates that India's share of imports from Sweden is greater than Sweden's share of exports to the rest of the world. This suggests that Sweden plays a significant role in India's import market. Therefore, a high import intensity index implies that India imports from Sweden at a higher rate than Sweden's overall export distribution worldwide.

c. Export Intensity Index of Sweden's Trade with India:

$$XII_{sit} = [X_{si} / X_s] / [M_i / (M_w - M_s)] * 100$$

XII_{sit} represents the Export Intensity Index of Sweden's trade with India. It is calculated as follows: X_{si} = Sweden's exports to India, X_s = Total exports of Sweden, M_i = Total imports of India, M_w = Total world imports, M_s = Total imports of Sweden, and t = the period from 2004 to 2023. If the value of this index is greater than one, it means that Sweden's share of exports to India is higher than India's share of imports from the rest of the world. In other words, India is over-represented in Sweden's export market. Therefore, a value greater than one (or between 1 and 100 when multiplied by 100) indicates that Sweden has a higher export intensity to India compared to India's imports from other countries.

d. Import Intensity Index of Sweden's Trade with India:

$$MII_{sit} = [M_{si} / M_s] / [X_i / (X_w - X_s)] * 100$$

MII_{sit} refers to the Import Intensity Index of Sweden's trade with India. M_{si} stands for Sweden's imports from India M_s for Sweden's total imports X_i for India's total exports X_w for global exports X_s for Sweden's total exports and t for the 2004–2023 timeframe. A value larger than one (or between 1 and 100 when multiplied by 100) means that Sweden imports more goods from India than India exports to the rest of the world. This implies that India is overrepresented in Sweden's import market. To put it another way, Sweden imports more from India than it exports to other nations. There is substantial unrealized trade potential between the two countries if their import and export intensity values are less than 100. An examination of Sweden and India's import and export intensity indices provide insight into the strength of their bilateral trade ties (Sundar and Ambrose 2014)

3.2 Hypothesis Testing

When analysing research findings, hypothesis testing is essential. The secondary data used in this study was gathered and imported into Microsoft Excel for additional examination. The research data was examined and validated using a variety of statistical tools applied in Microsoft Excel. To calculate the results for hypothesis testing, the independent t-test was employed.

3.3 Independent t-test

The independent t-test is a statistical method used to compare the means of two independent samples to determine whether they originate from populations with different means. Also known as the two-sample t-test or Student's t-test, it is an inferential statistical technique that assesses whether the difference between two sample means is statistically significant (Cohen, 2013). This test is instrumental for comparing two unrelated groups to determine whether their means differ significantly. It is commonly employed in between-group research designs and is widely used for analysing differences

between control and experimental groups. In an independent t-test, each case must have values for two variables: the grouping variable (independent variable) and the test variable (dependent variable). The grouping variable classifies cases into two mutually exclusive categories (e.g., gender: male and female), while the test variable measures a quantitative characteristic (e.g., test performance). The independent t-test tests whether the mean of the dependent variable in one group differs significantly from that in the second group. For example, it can determine if the average test performance of male students significantly differs from that of female students (Understanding the Independent Sample t-test, n.d.).

Assumptions of the Independent t-Test

Three fundamental presumptions underlie the independent t-test. The first requirement is that the data be independent, meaning there is no systematic relationship between one participant's scores and those of other participants. This is known as the assumption of independence, and it guarantees that observations made in one group won't affect those in another. The second requirement is that the dependent variable, as determined by the grouping variable, be normally distributed within each population. The validity of the test results is guaranteed by this assumption, which is known as normalcy. Finally, the test assumes that the variances of the dependent variables are roughly equal across both populations. This guarantees that the statistical comparison between the two groups will always be valid and significant.

4. Data Analysis

4.1 India's Bilateral Trade with Sweden

The trade relationship between India and Sweden has shown steady growth from 2004 to 2023, though global economic events have influenced fluctuations. Despite periodic declines, Sweden's exports to India increased from \$1130.97 million in 2004 to \$1654.41 million in 2023. Similarly, Sweden's imports from India have grown from \$309.60 million in 2004 to a peak of \$1200.62 million in 2022, before slightly declining to \$1094.37 million in 2023. India's exports to Sweden have also expanded significantly, rising from \$232.03 million in 2004 to \$953.73 million in 2023, while India's imports from Sweden have more than doubled from \$923.18 million in 2004 to \$1917.37 million in 2023. A consistent pattern in the trade relationship is that India imports more from Sweden than it exports, resulting in a trade deficit. However, Sweden also imports more from India than it exports to India, reflecting a trade deficit with India. The highest trade deficit for India was in 2008, when imports from Sweden reached \$2166.94 million, while exports stood at only \$578.07 million. On the other hand, Sweden's highest trade deficit with India occurred in 2022, when its imports from India surged to \$1200.62 million, while exports stood at \$1579.07 million.

There have been notable fluctuations in trade over the years. In 2008, trade volumes peaked before declining in 2009, likely due to the global financial crisis. The trade relationship rebounded in 2010, but 2016 saw a sharp drop, potentially influenced by demonetisation in India and global economic slowdown. The most significant decline was in 2020 when COVID-19 disrupted global trade, but recovery was evident in 2021-2023, with 2022 recording the highest figures for both imports and exports. Recent years have seen promising growth, with India's exports to Sweden surpassing \$1 billion for the first time in 2022 and Sweden's imports from India reaching record levels. Despite occasional declines, the overall trend indicates a strengthening trade partnership between the two countries. Sectors such as technology, pharmaceuticals, and sustainable energy are expected to drive further growth in bilateral trade in the coming years.

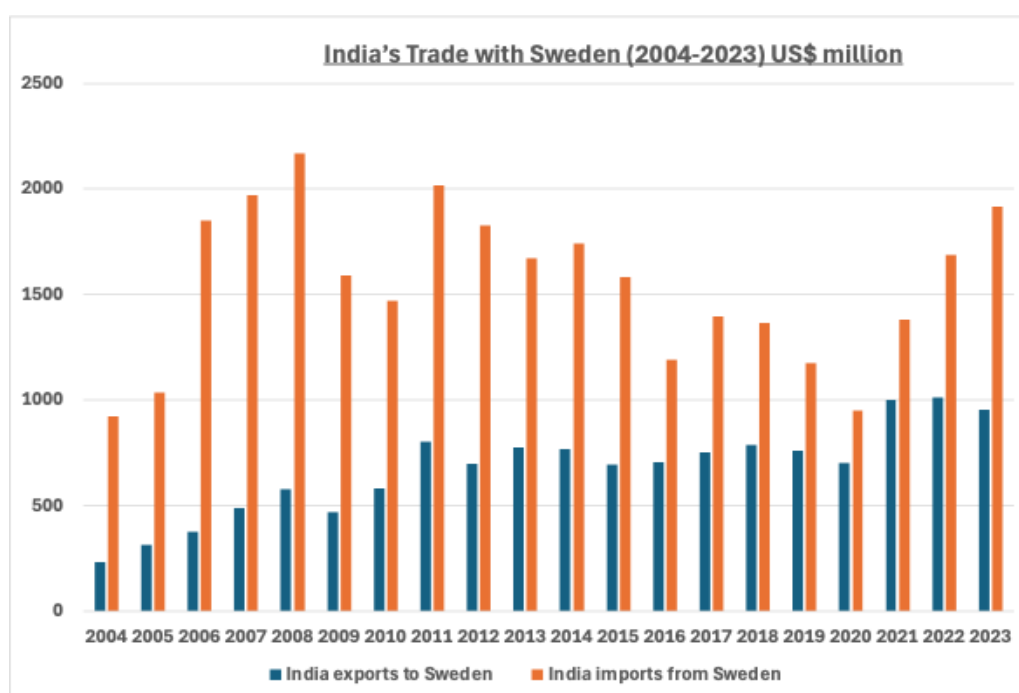
Table I: India's Trade with Sweden (Values in USD million)

Year	India's exports to Sweden (A)	India imports from Sweden (B)	Total Trade(A+B)	Trade Balance (A-B)	Export/Import Ratio (A/B)
2004	232.03	923.18	1155.21	-691.16	0.25
2005	313.09	1037.16	1350.25	-724.07	0.30
2006	377.20	1850.02	2227.22	-1472.83	0.20
2007	486.12	1970.46	2456.57	-1484.34	0.25
2008	578.07	2166.94	2745.01	-1588.88	0.27
2009	468.60	1590.94	2059.54	-1122.34	0.29
2010	581.50	1469.49	2050.99	-887.99	0.40
2011	801.88	2016.92	2818.81	-1215.04	0.40
2012	698.20	1827.75	2525.95	-1129.54	0.38
2013	776.81	1673.39	2450.20	-896.58	0.46
2014	767.12	1743.05	2510.17	-975.93	0.44
2015	693.59	1583.11	2276.70	-889.52	0.44
2016	707.17	1191.63	1898.80	-484.46	0.59

2017	753.84	1394.65	2148.48	-640.81	0.54
2018	787.70	1366.04	2153.74	-578.33	0.58
2019	759.57	1173.57	1933.13	-414.00	0.65
2020	701.91	950.50	1652.41	-248.60	0.74
2021	999.62	1380.45	2380.07	-380.83	0.72
2022	1011.61	1686.99	2698.60	-675.37	0.60
2023	953.74	1917.37	2871.10	-963.63	0.50

Sources: UN COMTRADE and Author

Figure I: India's Trade with Sweden (2004-2023) USD Million



Sources: UN COMTRADE and Author

4.1.1 Analysis of India's Trade with Sweden (2004–2023)

Table I provides data on India's trade with Sweden from 2004 to 2023, including exports, imports, total trade volume, trade balance, and the export/import ratio. A detailed analysis of the trends and implications is presented below. Trade Balance and Trade Deficit Trends India has consistently experienced a trade deficit with Sweden throughout the period, indicating that its imports from Sweden have exceeded its exports. The highest trade deficit was recorded in 2008 at 1588.875 million USD, while the lowest was in 2020 at -248.596 million USD. In recent years, the trade deficit has fluctuated, showing a significant reduction in 2020, but it increased again in 2022 and 2023.

Export and Import Trends: India's exports to Sweden have shown a general upward trend, rising from 232.026 million USD in 2004 to 953.735 million USD in 2023, with the highest export value recorded in 2022 at 1011.614 million USD. However, India's imports from Sweden have consistently exceeded its exports, resulting in a trade imbalance. Imports peaked in 2023 at 1917.365 million USD, indicating an increasing dependence on Swedish goods.

Total Trade Growth: The trade volume between India and Sweden has grown significantly over time, highlighting the strengthening economic ties between the two countries. Rising from 1155.208 million USD in 2004 to 2871.1 million USD in 2023, total trade has nearly doubled. The highest recorded trade volume was in 2023, reflecting the expanding economic engagements between India and Sweden.

Export-Import Ratio (A/B) and Trade Dependency: The export-import ratio between India and Sweden has consistently been below 1, indicating that India imports significantly more from Sweden than it exports to Sweden. The ratio improved, rising from 0.25 in 2004 to 0.74 in 2020. Nevertheless, it had reversed past gains by 2023, falling to 0.50.

50. With a lower trade deficit, the 2020 export-import ratio was at its highest of 0.74, while the 2006 export-import ratio was at its lowest of 0.20, indicating India's peak reliance on Swedish imports.

Notable Trends and Observations: India had a large trade deficit from 2008 to 2010 due to rising imports. However, by 2010, the trade balance had improved somewhat, as evidenced by the export-import ratio improving to point 0.40. India's trade balance improved most between 2016 and 2020, with the export-import ratio steadily rising to its highest level during that period. But between 2021 and 2023, the export-import ratio fell, and the trade deficit widened again, suggesting a renewed reliance on Swedish imports.

Potential Reasons for Trade Trends: India relies heavily on Sweden for high-tech industrial machinery, automotive components, and pharmaceuticals, making it a key supplier in these sectors. While India's exports to Sweden have been growing, they have not kept pace with rising imports, resulting in a persistent trade imbalance. Various economic factors, including global market shifts, exchange rates, and trade agreements, have influenced fluctuations in trade patterns over time. In 2020, the impact of COVID-19 led to the lowest recorded trade deficit, likely due to a decline in imports from Sweden while exports remained stable.

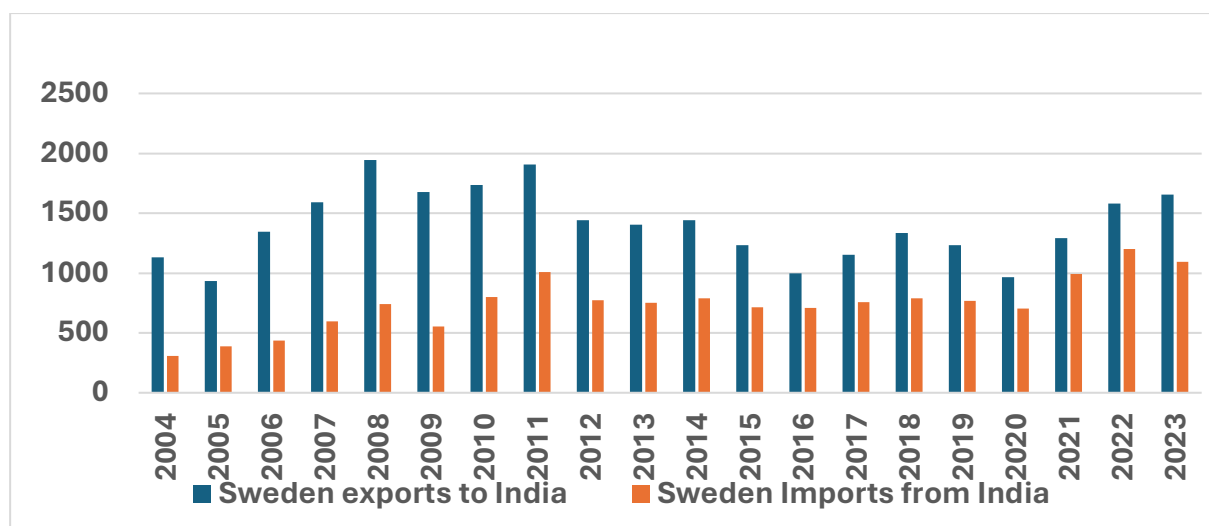
India-Sweden trade has expanded significantly over the last two decades, but India continues to experience a trade deficit. Despite improvements in the export-import ratio in some years, India remains more reliant on Swedish imports. Strategic policies to enhance export diversification, bilateral agreements, and domestic manufacturing could help India achieve a more balanced trade relationship with Sweden.

Table II: Sweden's Trade with India (values in US\$ million)

Year	Sweden's exports to India (A)	Sweden's Imports from India(B)	Total Trade (A+B)	Trade Balance (A-B)	Export/Import Ratio (A/B)
2004	1130.97	309.60	1440.58	821.37	3.65
2005	933.72	387.98	1321.70	545.74	2.41
2006	1347.02	434.09	1781.11	912.93	3.10
2007	1589.47	594.84	2184.31	994.63	2.67
2008	1942.52	740.84	2683.36	1201.68	2.62
2009	1675.89	551.16	2227.05	1124.73	3.04
2010	1733.99	799.71	2533.71	934.28	2.17
2011	1908.76	1006.07	2914.83	902.68	1.90
2012	1442.02	771.21	2213.23	670.80	1.87
2013	1402.13	752.44	2154.57	649.70	1.86
2014	1441.12	787.89	2229.01	653.24	1.83
2015	1232.24	711.36	1943.61	520.88	1.73
2016	999.96	707.51	1707.47	292.44	1.41
2017	1154.12	754.81	1908.92	399.31	1.53
2018	1336.70	786.29	2122.99	550.41	1.70
2019	1233.92	768.75	2002.66	465.17	1.61
2020	964.16	705.03	1669.19	259.13	1.37
2021	1289.26	992.34	2281.60	296.92	1.30
2022	1579.07	1200.62	2779.69	378.45	1.32
2023	1654.41	1094.37	2748.79	560.04	1.51

Sources: UN COMTRADE and Author

Figure II: Sweden's Trade with India (2004-2023) USD Million



Sources: UN COMTRADE and Author

4.1.2 Analysis of Sweden's Trade with India (2004–2023)

Table II analyses Sweden's trade with India from 2004 to 2023. We can break down the data into key trends and insights:

Exports and Imports Overview: Sweden's exports to India have generally increased over the years, reaching a significant peak of US\$1942.52 million in 2008 and standing at US\$1654.41 million in 2023. Similarly, imports from India have shown a rising trend, albeit with greater fluctuations than exports. Imports grew from US\$309.60 million in 2004 to US\$1094.37 million in 2023, reflecting the expanding trade relationship between the two countries.

Total Trade (A + B): The total trade between Sweden and India has generally grown over the years, with a noticeable dip during the 2015–2020 period. The highest total trade value was US\$2914.83 million in 2011, and the trade value in 2023 was US\$2748.79 million, showing sustained, though slightly slowed, growth over the years.

Trade Balance (A - B): Sweden has consistently maintained a trade surplus with India, although the trade balance (exports minus imports) has fluctuated over time. The highest recorded trade balance was US\$1201.68 million in 2008, while in 2023, it stood at US\$560.04 million. However, the trade balance has generally declined, particularly after 2011, indicating a narrowing gap between exports and imports.

Export-to-Import Ratio (A/B): Sweden has consistently exported more to India than it has imported, as reflected in the Export/Import ratio. In 2004, the ratio reached its highest point at 3.65, indicating that Sweden's exports were nearly four times the value of its imports from India. However, this ratio has gradually declined over the years, signalling a narrowing trade surplus. By 2023, the ratio had decreased to 1.51, suggesting a more balanced trade relationship, with Sweden's exports still exceeding imports but at a significantly narrower margin than in earlier years.

Key Observations: Sweden has demonstrated strong export performance to India, with exports steadily increasing despite a decline in the export/import ratio. This growth highlights the continued demand for Swedish products in India. Meanwhile, imports from India have shown fluctuations, with a significant rise in the latter years, particularly between 2020 and 2022. Although Sweden has consistently maintained a trade surplus with India, this surplus has been gradually shrinking, peaking in 2008 before a steady decline. The declining export/import ratio further indicates a shift toward a more balanced trade relationship, as imports from India have been growing faster than Sweden's exports in recent years. In summary, while Sweden maintains a positive trade balance with India, the margin of that surplus has narrowed, and the overall trade relationship has become more balanced.

Table III: India's Exports to Sweden (sorted on the latest year 2023 & above 1 USD million)

HS Code	Description	2019	2020	2021	2022	2023
	All products	759.57	701.91	999.62	1011.61	953.74
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	89.22	73.03	125.93	132.25	133.83
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	43.32	43.64	67.20	63.91	103.79

62	Articles of apparel and clothing accessories, not knitted or crocheted	91.37	71.79	78.33	98.68	91.48
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	49.57	42.98	64.92	68.26	77.63
61	Articles of apparel and clothing accessories, knitted or crocheted	53.86	44.77	56.76	61.72	47.29
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	47.20	42.50	66.84	62.18	46.30
73	Articles of iron or steel	33.75	31.98	51.14	50.53	45.45
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical ...	16.87	12.03	20.05	28.23	39.57
57	Carpets and other textile floor coverings	36.02	33.45	59.86	45.51	33.56
88	Aircraft, spacecraft, and parts thereof	18.61	17.22	18.55	24.64	28.09
40	Rubber and articles thereof	22.92	25.77	34.41	24.62	27.15
30	Pharmaceutical products	14.97	24.85	24.54	18.66	26.26
29	Organic chemicals	15.53	19.88	33.56	30.82	23.10
71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad ...	21.64	19.61	25.70	26.92	21.25
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles ...	31.11	23.78	26.60	25.36	20.77
39	Plastics and articles thereof	15.62	17.77	25.88	22.77	18.14
76	Aluminium and articles thereof	18.58	21.93	14.72	19.10	16.39
72	Iron and steel	12.07	8.61	24.42	18.93	15.12
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; ...	12.91	11.01	19.10	17.02	13.59
9	Coffee, tea, maté and spices	10.13	9.61	12.00	13.04	12.44
10	Cereals	5.91	4.94	3.87	4.80	11.03
74	Copper and articles thereof	4.88	4.91	8.82	7.78	7.49
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal	9.41	9.54	9.90	9.80	6.92
38	Miscellaneous chemical products	5.50	5.38	12.97	7.24	6.30
83	Miscellaneous articles of base metal	7.15	6.19	8.47	8.61	6.13
64	Footwear, gaiters and the like; parts of such articles	7.63	6.09	7.32	7.07	5.92
95	Toys, games and sports requisites; parts and accessories thereof	4.67	5.64	8.55	10.48	5.79
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal ...	4.91	3.92	4.31	3.72	5.16
24	Tobacco and manufactured tobacco substitutes; products, whether or not containing nicotine, ...	3.74	3.75	3.85	4.25	4.24
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring ...	3.91	2.70	4.16	4.72	3.20
75	Nickel and articles thereof	1.09	1.42	1.71	2.05	3.13
44	Wood and articles of wood; wood charcoal	3.27	2.89	4.71	3.30	2.97
86	Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures ...	3.71	11.49	27.47	29.55	2.93
20	Preparations of vegetables, fruit, nuts or other parts of plants	2.40	2.71	2.61	2.78	2.75
79	Zinc and articles thereof	1.99	1.44	1.74	1.87	2.74
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	1.90	1.86	3.08	2.62	2.60
70	Glass and glassware	3.37	2.76	4.44	3.17	2.43
69	Ceramic products	2.49	2.02	2.28	2.65	2.37

68	Articles of stone, plaster, cement, asbestos, mica or similar materials	1.75	1.59	2.32	2.03	2.30
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	2.33	1.82	2.75	3.88	2.03
52	Cotton	1.03	1.80	2.05	2.42	1.98
56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof	0.94	1.26	1.21	1.67	1.91
89	Ships, boats and floating structures	0.00	0.00	0.00	0.00	1.73
7	Edible vegetables and certain roots and tubers	2.88	2.43	1.81	1.87	1.70
81	Other base metals; cermets; articles thereof	0.79	0.70	0.85	1.54	1.45
21	Miscellaneous edible preparations	0.92	0.83	1.11	0.84	1.40
96	Miscellaneous manufactured articles	0.66	0.73	1.12	1.16	1.39
46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	1.10	1.52	1.66	1.55	1.30
8	Edible fruit and nuts; peel of citrus fruit or melons	1.16	0.60	0.98	1.13	1.28
3	Fish and crustaceans, molluscs and other aquatic invertebrates	0.69	1.02	0.66	0.99	1.18

Sources: UN COMTRADE

4.1.3 Analysis of India's Exports to Sweden (2019-2023)

Table III shows a breakdown of India's exports to Sweden by category from 2019 to 2023. Let's analyse the data by trends, major products, and fluctuations over the years.

Overall Export Trends (2019-2023): India's total exports to Sweden have experienced a slight decline over the past five years, rising from US\$759.57 million in 2019 to US\$953.73 million in 2023, representing a modest growth of about 25.5%. Despite this overall rise, exports fell to US\$701.91 million in 2020, likely due to the global impact of the COVID-19 pandemic. Following that, exports grew steadily, reaching a peak of US\$1,011.61 million in 2022 before declining slightly to US\$953.73 million in 2023.

Key Product Categories: India's exports to Sweden have seen notable growth in various categories over the past few years. The largest export category is Nuclear Reactors, Boilers, Machinery, and Mechanical Appliances (HS 84), which consistently held a strong share of total exports, peaking at US\$133.83 million in 2023, up from US\$89.22 million in 2019. Exports of Electrical Machinery (HS 85) have also more than doubled, rising from US\$43.32 million in 2019 to US\$103.79 million in 2023. Apparel (HS 62 & 61), including both knitted and non-knitted items, remains another major export, with HS 62 (non-knitted apparel) valued at US\$91.48 million in 2023, and HS 61 (knitted apparel) at US\$47.29 million, despite some fluctuations. Vehicle exports (HS 87) have steadily increased from US\$49.57 million in 2019 to US\$77.63 million in 2023, reflecting strong demand for automotive products in Sweden. Pharmaceutical Products (HS 30) saw a significant rise, growing from US\$14.97 million in 2019 to US\$26.26 million in 2023. Finally, Optical and Precision Instruments (HS 90) experienced substantial growth, reaching US\$39.57 million in 2023, up from US\$16.87 million in 2019, especially after a notable increase in 2022.

Fluctuating Categories: Exports of Rubber and Articles Thereof (HS 40) have remained relatively stable, ranging from US\$22 million to US\$27 million over the years, with 2023 seeing a slight increase to US\$27.15 million. In contrast, exports of Organic Chemicals (HS 29) reached a high of US\$33.56 million in 2021 but have since dropped to US\$23.10 million in 2023, indicating a decline in this segment. Furniture exports (HS 94) also fluctuated, peaking at US\$19.10 million in 2021 and dropping to US\$13.59 million in 2023.

Export Trends and Composition: The export composition reveals a clear distinction between high-value and low-value product categories. Machinery (HS 84), electrical equipment (HS 85), and pharmaceuticals (HS 30) have seen significant increases in exports, reinforcing their strong market demand. In contrast, several categories, such as iron and steel (HS 72), rubber products (HS 40), and textiles like carpets and floor coverings (HS 57), have experienced declining exports. Low-value exports include products such as toys (HS 95), zinc (HS 79), and footwear (HS 64), with the highest in this segment—toys, games, and sports requisites—falling from US\$10.48 million in 2022 to US\$5.79 million in 2023. Additionally, tobacco (HS 24) and miscellaneous edible preparations (HS 21) have maintained relatively low export values, ranging between US\$3 million and US\$4 million in 2023. The overall composition is dominated by high-value exports such as machinery, vehicles, and apparel. At the same time, lower-value products like furniture, ceramics, and paper products account for a smaller share of total export volume. These trends highlight the evolving nature of trade and the shifting competitiveness of different sectors.

India's exports to Sweden have grown steadily, driven primarily by machinery, electrical equipment, and apparel, which continue to expand. The pharmaceutical sector has also experienced a notable rise, further strengthening India's trade presence in Sweden. However, fluctuations have been observed in minor product categories, such as organic chemicals and certain textiles, while low-value exports, such as toys and footwear, have shown only minor increases. Despite these gains, a slight decline in total exports in 2023, following a peak in 2022, suggests challenges in sustaining growth, particularly in lower-value categories. This analysis underscores the diversity of India's exports to Sweden, highlighting strong demand in key sectors while also revealing potential areas for improvement and strategic trade development.

Table IV: Sweden Exports to India (sorted on the latest year 2023 & above 1 USD Million)

HS codes	Description	2019	2020	2021	2022	2023
	All products	1233.92	964.16	1289.26	1579.07	1654.41
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	263.47	236.56	291.08	262.74	305.60
72	Iron and steel	148.12	122.60	180.15	258.69	271.68
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	97.16	71.58	94.37	130.24	198.23
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or ...	112.68	75.98	144.95	216.66	169.22
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	181.61	91.26	116.97	130.19	158.97
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	92.39	69.69	83.17	111.40	109.34
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical ...	53.00	38.50	56.78	50.98	54.94
38	Miscellaneous chemical products	53.76	57.39	49.46	45.97	42.90
30	Pharmaceutical products	19.93	24.49	37.01	27.85	42.26
74	Copper and articles thereof	24.19	21.29	25.67	35.08	40.56
39	Plastics and articles thereof	41.95	20.15	26.48	38.12	39.70
29	Organic chemicals	21.43	25.40	42.77	69.15	36.25
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal	19.08	22.89	34.46	38.95	32.76
73	Articles of iron or steel	14.33	13.91	16.73	17.48	21.58
44	Wood and articles of wood; wood charcoal	9.27	4.46	6.81	14.96	19.79
76	Aluminium and articles thereof	8.75	9.58	10.24	14.76	19.43
75	Nickel and articles thereof	10.69	12.33	14.14	11.23	19.26
40	Rubber and articles thereof	9.51	8.52	11.57	14.75	13.03
22	Beverages, spirits and vinegar	4.13	3.95	6.57	9.66	9.97
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, ...	5.88	6.09	4.70	5.55	8.12
79	Zinc and articles thereof	0.86	0.92	4.63	9.39	6.92
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring ...	2.95	3.49	3.72	4.09	4.03
86	Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures ...	5.72	6.03	4.37	2.16	3.44
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial ...	4.96	3.53	5.79	3.56	3.10
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	1.38	1.55	2.43	3.12	2.38
88	Aircraft, spacecraft, and parts thereof	0.75	0.28	0.12	0.18	2.37
70	Glass and glassware	2.00	1.22	2.11	3.39	2.19
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; ...	1.09	0.99	1.17	1.22	1.95

23	Residues and waste from the food industries; prepared animal fodder	0.00	0.26	0.68	0.51	1.52
95	Toys, games and sports requisites; parts and accessories thereof	0.64	0.31	0.32	1.10	1.13

Sources: UN COMTRADE

4.1.4 Analysis of Sweden's Exports to India (2019-2023)

Table IV shows Sweden's exports to India across various product categories from 2019 to 2023. Let's break down the trends, key products, and fluctuations over the years.

Overall Export Trends (2019-2023): Sweden's total exports to India have increased significantly, rising from US\$1.23 billion in 2019 to US\$1.65 billion in 2023, a growth of approximately 34.4% over five years. Although exports declined in 2020 to US\$964.16 million, likely due to the COVID-19 pandemic, trade rebounded in 2021, reaching US\$1.29 billion. This upward trend continued in subsequent years, with exports reaching US\$1.58 billion in 2022 and US\$1.65 billion in 2023, indicating a steady recovery and expansion in bilateral trade.

Key Product Categories: Sweden's exports to India have been led by nuclear reactors, boilers, machinery, and mechanical appliances (HS 84), which consistently remain the largest export category, increasing from US\$236.56 million in 2020 to US\$305.60 million in 2023. Iron and steel (HS 72) exports have also surged, rising from US\$148.12 million in 2019 to US\$271.68 million in 2023, reflecting an 83% increase driven by strong demand. Vehicles (HS 87) and their parts have more than doubled in value, growing from US\$97.16 million in 2019 to US\$198.23 million in 2023, with robust growth in the last two years. Electrical machinery and equipment (HS 85) saw a decline in 2020 (US\$91.26 million) but rebounded to US\$158.97 million in 2023, showing a solid recovery. Exports of pulp, paper, and paperboard remain significant, with HS 47 declining from US\$112.68 million in 2019 to US\$169.22 million in 2023, while HS 48 increased from US\$92.39 million in 2019 to US\$109.34 million in 2023, reflecting steady demand for wood and paper products.

Fluctuating Categories: Sweden's exports to India in the chemical and metal sectors have shown varied trends. Miscellaneous chemical products (HS 38) remained relatively stable, fluctuating between US\$42 million and US\$57 million, though experiencing a slight decline by 2023. Organic chemicals (HS 29) exhibited volatility, peaking at US\$69.15 million in 2022 before falling to US\$36.25 million in 2023. In contrast, pharmaceutical products (HS 30) displayed robust growth, increasing from US\$19.93 million in 2019 to US\$42.26 million in 2023, more than doubling over the period, indicating rising demand in India. Additionally, exports of copper and its articles (HS 74) steadily grew from US\$24.19 million in 2019 to US\$40.56 million in 2023, reflecting an expanding market for Swedish copper products in India.

Growth and Sectoral Composition: Sweden's exports to India span both high- and low-value categories, with distinct trends in each. Among low-value exports, toys, games, and sports requisites (HS 95) increased gradually from US\$0.64 million in 2019 to US\$1.13 million in 2023, while furniture (HS 94) remained relatively stable, fluctuating between US\$1 million and US\$1.95 million. Aircraft, spacecraft, and parts (HS 88) showed a notable rise, growing from US\$0.75 million in 2019 to US\$2.37 million in 2023. Significant growth was observed in key sectors, including vehicles (HS 87), which more than doubled, and iron and steel (HS 72), which grew by over 80%. Pharmaceuticals (HS 30) and copper (HS 74) also recorded strong growth, particularly in the last two years, while nuclear reactors and machinery (HS 84) showed steady but slower expansion. However, some categories experienced declines; pulp and paper (HS 47) dipped in 2020 and failed to return to 2019 levels by 2023, while miscellaneous chemical products (HS 38) and organic chemicals (HS 29) showed volatility and decline. Overall, Sweden's exports to India are primarily driven by high-value sectors such as machinery, steel, vehicles, and electrical equipment. At the same time, lower-value products like toys, furniture, and chemicals contribute modestly but show gradual increases.

Sweden's exports to India have shown steady growth, driven by key sectors such as machinery, steel, pharmaceuticals, and vehicles, reflecting a strengthening trade relationship. Machinery, vehicles, and steel remain dominant, while high-value products like pharmaceuticals and copper have gained traction in recent years. However, some categories, including organic chemicals and pulp, have faced volatility, signalling potential challenges and opportunities in future trade dynamics. Overall, Sweden's exports to India continue to expand, with a mix of traditional and emerging product categories shaping bilateral trade.

4.2 Trade Intensity Index between India and Sweden(2004-2023)

Export Intensity Index of India's Trade with Sweden	XII _{ist}
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Import Intensity Index of India's Trade with Sweden	MII_{ist}
Export Intensity Index of Sweden's Trade with India	XII_{sit}
Import Intensity Index of Sweden's Trade with India	MII_{sit}

Table V: Trade Intensity Index between India and Sweden(2004-2023)

Year (T)	XII_{ist}	MII_{ist}	XII_{sit}	MII_{sit}
2004	28.23	68.36	86.28	36.37
2005	29.43	58.02	53.61	35.53
2006	29.69	83.59	62.46	33.37
2007	30.42	72.89	60.28	36.42
2008	30.32	59.14	54.43	38.19
2009	27.51	55.67	60.43	31.89
2010	26.60	39.44	47.53	36.44
2011	26.89	41.60	40.14	33.84
2012	26.43	39.25	31.40	29.50
2013	26.44	39.70	33.60	26.01
2014	27.49	42.65	35.74	28.54
2015	30.84	46.71	37.03	31.78
2016	30.29	37.54	32.06	30.42
2017	28.73	35.43	29.96	28.86
2018	27.36	30.72	30.84	27.32
2019	27.52	28.15	30.40	27.83
2020	29.60	28.71	29.73	29.69
2021	29.58	27.76	26.54	29.46
2022	27.14	28.29	27.49	32.04
2023	26.68	33.50	29.59	30.82

Sources: UN COMTRADE and Author

4.2.1 Analysis of Trade Intensity Index (TII) Between India and Sweden (2004–2023)

The **Trade Intensity Index** (TII) measures the relative intensity of trade flows between two countries, both for exports and imports. The four indices in Table V are calculated as the share of each country's trade with Sweden relative to its total global trade, and they reflect the importance of trade between India and Sweden in each country's total trade.

Export Intensity Index of India's Trade with Sweden (XII_{ist}): The XII_{ist} index for India's exports to Sweden fluctuated between 28.23 in 2004 and 26.68 in 2023, showing a slight overall decline. The index remained relatively stable within the 26–30 range, with minor variations over the years. Notably, 2005 and 2015 saw peaks at 29.43 and 30.84, respectively, indicating periods when India's exports to Sweden held greater significance in comparison to India's total exports and global trade. The overall trend suggests a gradual decrease in India's relative export share to Sweden, despite some fluctuations in the intermediate years.

Import Intensity Index of India's Trade with Sweden (MII_{ist}): The MII_{ist} index has been consistently higher than the XII_{ist}, ranging from 28.15 in 2019 to a peak of 83.59 in 2006, indicating that Sweden's exports to India were particularly significant relative to India's total imports during that period. However, the index has shown a gradual decline over the years, with a notable drop from 83.59 in 2006 to 72.89 in 2007. Since 2014, the values have stabilised, fluctuating between 30 and 40. The most recent value of 33.50 in 2023 suggests a mild increase, reflecting a renewed importance of Sweden's exports to India in India's total imports.

Export Intensity Index of Sweden's Trade with India (XII_{sit}): The XII_{sit} index for Sweden's exports to India has fluctuated significantly, peaking at 86.28 in 2004 before declining sharply to 29.59 in 2023. The initial drop between 2004 and 2007 was followed by a period of relative stability around the 60–70 range until 2010, after which the

index gradually decreased through 2012. Since then, it has stabilised around 30, indicating that while Sweden’s exports to India remain steady, they are no longer as dominant in Sweden’s global trade as they once were.

Import Intensity Index of Sweden’s Trade with India (MI_{sit}): The MI_{sit} index, which assesses the relative significance of Sweden’s imports from India, has varied from 27.32 in 2018 to a high of 38.19 in 2008. The index experienced a notable decline after hitting this high point, particularly between 2008 and 2013, when it decreased from 38.19 to 26.01. However, the index has stabilised in recent years, ranging from 28 to 32, with a slight rise to 30.82 in 2023. For Sweden’s total imports, this suggests that the importance of imports from India has partially regained its relevance after a phase of decrease

When it comes to Sweden’s exports to India and India’s exports to Sweden, the trade intensity indices show a gradual decline in the significance of bilateral trade between the two countries. With import indices ranging from 28 to 38 and export indices from 26 to 35, the trade relationship remains significant. A more balanced import relationship is suggested by the MI_{ist} and MI_{isit} indices, which have increased stability over the last ten years. In the meantime, the declining XI_{ist} and XI_{isit} indices indicate a shift in trade priorities, with India-Sweden trade playing a more minor but still significant role within their broader global trade dynamics. Trade flows are still substantial despite this drop, with recent stabilisation and modest growth in sectors such as Sweden’s imports from India.

4.2.2 Group Statistics of Export Trade Intensity

The table presents the Group Statistics of Export Trade Intensity between India and Sweden. Here’s an analysis of the data:

Table VI: Group Statistics of Export Trade Intensity (2004-2023)

Export Intensity	Trade	N	Mean	Std. Deviation	Std. Error Mean
Export Index of Trade Sweden	Intensity of India’s with	20	28.36	1.52	0.34
Export Index Sweden’s Trade with India	Intensity of	20	41.98	16.02	3.58

Sources: UN COMTRADE and Author

Comparison of Export Intensity: India’s Export Intensity Index is 28.36, with low variability (standard deviation of 1.52). In contrast, Sweden’s Export Intensity Index with India has a higher mean of 41.98 but exhibits greater fluctuations with a standard deviation of 16.02.

Interpretation of Standard Deviation: India's export intensity index remains relatively stable, as reflected in its low standard deviation (1.52), indicating minimal variation in trade intensity over time, whereas Sweden’s export intensity index shows significant fluctuations with a much higher standard deviation (16.02).

Statistical Implications: India’s trade intensity with Sweden is more consistent and predictable, as indicated by its lower Standard Error Mean (SE) of 0.34 compared to Sweden’s 3.58, which reflects greater variability in Sweden’s trade intensity with India. Additionally, Sweden’s higher mean export intensity index suggests that Sweden trades more intensively with India than India does with Sweden.

Possible Explanations: Sweden’s trade intensity with India fluctuates more due to factors such as trade policies, demand shifts, or industry-specific changes, whereas India’s trade intensity remains stable, likely because of consistent exports in specific product categories. Despite Sweden having a higher average export trade intensity with India, its volatility contrasts with India’s lower but steadier trade intensity. These insights can inform trade policy decisions, market stability forecasts, and long-term evaluations of trade relationships.

These insights can help trade policy decisions, predict market stability, and evaluate long-term trade relationships.

4.2.3 Hypotheses Tested for Export Intensity Index:

To attain the objective of the study, the following hypotheses were developed for statistical testing:

1. **Null Hypothesis (H0):** There is no significant difference between the Export Intensity Index of India’s Trade with Sweden and the Export Intensity Index of Sweden’s Trade with India.

2. **Alternative Hypothesis (H_a):** There is a significant difference between the Export Intensity Index of India's Trade with Sweden and the Export Intensity Index of Sweden's Trade with India.

Table VII: T value and Significant Value of Export Trade Intensity (Independent t-test)

	T	DF	Sig.(2-tailed)	Mean Diff	Std. Error Difference
Equal variances assumed	-3.78	38	0.0012	-13.62	-3.24
Equal variances not assumed	-3.78	19	0.0012	-13.62	-3.24

Sources: UN COMTRADE and Author

Interpretation:

Significance Level (p-value = 0.0012): Since the p-value < 0.05, we reject the null hypothesis. ○ This confirms that there is a statistically significant difference between the two export intensity indices.

Equal vs. Unequal Variances Both tests (equal and unequal variances) yield the same t-statistic (-3.78) and p-value (0.0012), reinforcing the reliability of the results.

Mean Difference (-13.62) India's Export Intensity Index with Sweden is lower by 13.62 points than Sweden's Export Intensity Index with India. The negative sign indicates that Sweden exports more to India than India exports to Sweden.

Standard Error Difference (3.24). The standard error represents the precision of the mean difference. A lower value suggests a more reliable estimate.

The Export Intensity Index of India's trade with Sweden is significantly lower than that of Sweden's trade with India. Sweden has a higher trade intensity with India, suggesting an imbalance in its export focus. India's lower yet stable export intensity with Sweden highlights the need for a strategic trade expansion. By diversifying exports to include high-growth sectors such as IT services, pharmaceuticals, and renewable energy solutions, India can strengthen its market presence. Enhancing bilateral trade agreements would help reduce trade barriers and improve market access. Additionally, reducing reliance on Swedish imports by encouraging domestic production in key sectors can help balance trade relations. Strengthening trade policies and fostering business collaborations will be crucial in achieving sustainable growth.

Sweden, despite its higher trade intensity with India, faces fluctuations that can impact long-term trade stability. To ensure consistency, Sweden can establish long-term contracts and build sustainable supply chains. Investing in Indian industries, particularly in automation, automobiles, and green technology, can create mutual economic benefits. A comprehensive policy framework, including a potential Free Trade Agreement (FTA) under India-EU trade negotiations, green trade policies, and digital partnerships, can further enhance economic cooperation. Strengthening collaboration in AI, cybersecurity, and smart cities through a Sweden-India Digital Alliance can drive innovation and create new growth opportunities.

4.2.4 Group Statistics of Import Trade Intensity -The table presents the Group Statistics of Import Trade Intensity between India and Sweden. Here's an analysis of the data:

Table VIII: Group Statistics of Import Trade Intensity (2004-2023)

Import Trade Intensity	N	Mean	Std. Deviation	Std. Error Mean
Import Intensity Index of India's Trade with Sweden	20	44.45	16.24	3.63
Import Intensity Index of Sweden's Trade with India	20	31.71	3.49	0.78

Sources: UN COMTRADE and Author

Comparison of Mean Import Intensity Index: The mean import intensity index for India's trade with Sweden is 44.45, which is significantly higher than Sweden's import intensity index with India, which stands at 31.71. This suggests that India imports from Sweden at a higher intensity than Sweden imports from India. A higher index indicates that India relies more on imports from Sweden than Sweden does on imports from India.

Variability in Trade Intensity (Standard Deviation): India's import intensity index has a standard deviation of 16.24, whereas Sweden's is only 3.49. This indicates that India's import intensity with Sweden fluctuates more over time, while Sweden's import intensity with India remains relatively stable. The greater fluctuations in India's import trade intensity could be due to varying demand for Swedish goods, trade policies, or external economic factors influencing imports.

Standard Error Mean (SE) and Stability: The standard error mean (SE) for India's import intensity is 3.63, which is much higher than Sweden's SE of 0.78. A lower SE for Sweden suggests that Sweden's import intensity with India is more consistent and predictable. In contrast, the higher SE for India reflects greater uncertainty and variation in its import intensity with Sweden, which could impact trade stability and long-term agreements.

Key Takeaways for Trade Policy: India imports more intensively from Sweden than Sweden does from India. However, India's import intensity is more volatile, whereas Sweden's is more stable over time. The greater unpredictability in India's import patterns could be attributed to economic fluctuations, demand shifts, or policy changes affecting imports from Sweden. Sweden's more stable import intensity may indicate steady, predictable demand for Indian goods. These insights can be valuable for policymakers and businesses aiming to stabilise trade relations and minimise fluctuations in India's imports from Sweden.

4.2.5 Hypotheses Tested for Import Intensity Index:

To attain the objective of the study, the following hypotheses were developed for statistical testing:

1. **Null Hypothesis (H₀):** There is no significant difference between the Import Intensity Index of India's Trade with Sweden and the Import Intensity Index of Sweden's Trade with India.
2. **Alternative Hypothesis (H_a):** There is a significant difference between the Import Intensity Index of India's Trade with Sweden and the Import Intensity Index of Sweden's Trade with India.

Table IX: t-value and Significance Value of Import Trade Intensity (Independent t-test)

	T	DF	Sig.(2-tailed)	Mean Diff	Std. Error Difference
Equal variances assumed	3.53	38	0.0019	12.74	2.85
Equal variances not assumed	3.53	21	0.0019	12.74	2.85

Sources: UN COMTRADE and Author

Interpretation:

T-Value and Degrees of Freedom (DF): The t-value of 3.53 indicates the strength and direction of the difference between the two groups in terms of import trade intensity. A higher t-value suggests a greater deviation from the null hypothesis. The degrees of freedom (DF) are 38 when equal variances are assumed and 21 when they are not, reflecting how sample size affects the test's statistical calculations.

Statistical Significance (p-value or Sig. (2-tailed)): The p-value of 0.0019 is less than 0.05, which means that the difference in import trade intensity between the two groups is statistically significant at a 95% confidence level. Since the p-value is very small, we can reject the null hypothesis, confirming that the observed difference is unlikely due to random chance and is, in fact, meaningful.

Mean Difference and Standard Error: The mean difference of 12.74 indicates that one group exhibits a higher import trade intensity than the other. This numerical value represents the extent of variation between the two groups. The standard error of difference (2.85) measures the variability in the sample data and helps assess the precision of the mean difference. A lower standard error suggests a more reliable estimate.

Since the p-value is very small (0.0019), we reject the null hypothesis, confirming that the import trade intensity between India and Sweden differs significantly. The results suggest that trade intensity is not equal and could be influenced by various economic and policy-related factors.

5. Discussion

The substantial growth in trade between Sweden and India over the last 20 years is indicative of a strengthening economic alliance. The fact that Swedish exports to India have continuously exceeded Indian exports to Sweden, however, means that India still faces a trade deficit. India continues to be more dependent on Swedish imports, despite some years of improvement in the export-import ratio. According to the Trade Intensity Index, trade between the two countries remains a vital part of their overall trade portfolios, despite a slight decline in relative importance. Furthermore, the MII_{sit} index continues to exceed the XII_{sit} index, indicating the growing importance of Sweden's imports to India. India can employ strategic policies such as diversifying its export sector, strengthening bilateral trade agreements, and increasing domestic manufacturing to improve its market access in Sweden and address this imbalance. Trade relations could become more balanced if exports from high-potential sectors like information technology, pharmaceuticals, and renewable energy are increased. While India's trade with Sweden has remained relatively stable, Sweden's trade patterns have shown greater volatility, despite a higher trade intensity with India. India-Sweden trade continues to be a stable and essential component of their economic interactions, despite the downward trend in both countries' Export Intensity Index, which is consistent with broader changes in global trade dynamics. Sweden appears to have an unbalanced export focus, as indicated by the statistically significant difference in trade intensity ($p = 0.0012$). Policymakers can use this knowledge to forecast market stability, shape trade policies, and strengthen enduring trade relationships. With steady Swedish imports and ongoing growth in Indian exports, Sweden is expected to remain an important trading partner for India. Trade relations are set to develop further as both countries place strong emphasis on technology, pharmaceuticals, and sustainable energy, thereby promoting innovation-driven cooperation and mutual economic growth.

5.1 Business and Trade Policy Implications

India needs to take a calculated approach to increase its market presence, as evidenced by its stable but comparatively lower export intensity with Sweden. India can enhance its access to the Swedish market by expanding its export portfolio, fortifying its trade regulations, and negotiating bilateral agreements. Trade could be further increased by focusing on key industries such as textiles, IT, and pharmaceuticals, thereby promoting more equitable exchange between the two countries. Even though trade with India is more intense, Sweden still experiences volatility that may affect the stability of its trade in the long run. Sweden can focus on creating long-term contracts and sustainable supply chains to ensure steady export growth. Furthermore, promoting investment in Indian industries would benefit both parties economically, enhancing two-way trade and building a more robust economic alliance.

5.2 Sector-Wise Trade Opportunities

Key Trade Sectors for India to Expand Exports to Sweden: India has multiple opportunities to strengthen its trade relations with Sweden across various sectors. In pharmaceuticals and healthcare, India, a global leader in generic drugs, can enhance exports of low-cost generics, vaccines, and biotechnology products. IT & software services are another area where India can expand outsourcing, software solutions, and collaborations in AI, cybersecurity, and fintech. The automotive & EV sector presents a significant opportunity where India can supply auto components, EV batteries, and software solutions to Sweden's strong automotive industry. With renewable energy & sustainability, India can export solar panels, wind energy tech, and green hydrogen solutions to support Sweden's focus on a circular economy. Textiles & apparel, particularly organic and sustainable textiles, can tap into Sweden's eco-conscious market. Finally, agriculture & food processing offers the potential for exporting organic products, plant-based proteins, processed foods, and spices to Sweden, where speciality foods are in demand.

Key Trade Sectors for Sweden to Expand Exports to India: Sweden, a leader in green technology & sustainable manufacturing, can expand exports to India in smart grids, waste management technologies, and green construction. In automation & AI, Sweden's expertise in Industry 4.0 positions it well to supply robotics, AI-driven automation, and IoT solutions for India's growing industrial sector. Luxury goods & retail can also benefit from India's expanding middle class, with Swedish brands such as H&M and IKEA strengthening their presence in fashion, furniture, and home décor. Defence & Aerospace is another key area where Sweden, with its advanced defence technology (e.g., SAAB, Gripen), can partner with India in aircraft manufacturing and naval systems. Lastly, in EVs & battery tech, Sweden can expand its EV exports and establish battery plants and R&D centers in India, supporting India's growing electric mobility sector.

6. Conclusion

Sweden is an essential supplier of pharmaceuticals, auto parts, and sophisticated industrial machinery to India. But because Sweden's growing imports are outpacing India's growing exports, there is a persistent trade imbalance. Global

market trends, exchange rate fluctuations, and trade agreements are among the factors that have impacted trade patterns. Due to the COVID-19 pandemic, trade was greatly affected, and 2020 saw the lowest trade deficit, most likely due to lower Swedish imports and stable Indian exports. Clothing machinery, electrical equipment, and the quickly expanding pharmaceutical industry have been the main drivers of India's exports to Sweden, bolstering its global market share. Although there have been some changes in the textile and organic chemical industries, lower-value exports such as toys and shoes have only increased slightly. Even though total exports peaked in 2022, a modest drop in 2023 indicates difficulties maintaining growth, particularly in lower-value categories. Due to changes in industry demand and trade policies, this trade analysis focuses on Sweden's fluctuating trade intensity and India's varied exports. In contrast, Sweden's trade intensity with India is higher but more volatile, while India's trade intensity with Sweden is lower but more stable. This disparity highlights the need for India to expand its trade presence strategically and underscores an imbalance in export priorities.

India's market position could be strengthened by boosting exports in high-growth sectors such as IT services, pharmaceuticals, and renewable energy. In addition to lowering trade barriers and facilitating market access, strengthening bilateral trade agreements would promote a more equitable trading relationship. India may be able to reduce its reliance on Swedish imports by promoting domestic manufacturing in key sectors. Even though trade between Sweden and India is more intense, there are still fluctuations that could affect trade stability over the long run. Creating sustainable supply chains and long-term agreements could guarantee consistency. Sweden could gain mutual economic benefits by investing in Indian industries like green technology, automation, and the automotive sector. To further improve collaboration, a comprehensive policy framework that incorporates green trade policies, digital partnerships, and a possible Free Trade Agreement (FTA) under the India-EU negotiations could be put in place. Furthermore, cooperation in cybersecurity AI and smart cities via a Sweden-India Digital Alliance may open up new avenues for expansion.

7. Policy Recommendations for Strengthening India-Sweden Trade

Bilateral Trade Agreements: To boost trade, a Free Trade Agreement (FTA) between India and Sweden, as part of the India-EU trade negotiations, can reduce tariffs and enhance cooperation. Additionally, strengthening the India-Sweden Joint Action Plan can promote sustainable development, innovation, and energy collaboration.

Sustainable & Green Trade Policies: A **Sustainability Trade Pact** can encourage the export of green energy, circular-economy products, and carbon-neutral supply chains. Joint R&D projects in clean energy and EV technologies can further enhance bilateral trade.

Investment & Ease of Doing Business: Sweden can increase **foreign direct investment (FDI)** in India, particularly in the automotive, automation, and renewable energy sectors. India, in turn, can establish special economic zones (SEZs) to facilitate Swedish businesses in setting up manufacturing hubs.

Digital & Tech Partnerships: A **Sweden-India Digital Alliance** can strengthen collaboration in AI, cybersecurity, and smart city development. Additionally, both countries can enhance cooperation in fintech and digital banking solutions, further solidifying their economic relationship.

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