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

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Abstract
Sweden and India represent two dynamic nations with unique economic structures, trade policies, and industrial landscapes that play a pivotal role 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, spotlighting 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 the trade dynamics between our nations through various statistical tools, particularly emphasising 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 main focus of this relationship with Sweden in the early decades was development cooperation. giving India's developing industries financial and technical support. Sweden's facilitation of technology transfers during this time was essential to India's industrialisation and investments in important industries. The 1990s saw a dramatic shift in India-Sweden relations that mirrored India's economic growth. opening up and joining the global economy. As both nations saw the potential this shift caused the bilateral focus to shift toward 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 used its advantages to try to get a foothold in Sweden's Strategic location as a point of entry into the European Union (Embassy of India, 2023). Over time, trade exchanges between Sweden and India have transitioned from specific industries to trade in services and products. Sweden historically exported most of their products to India in the form of paper, machinery, and automobile parts. In Sweden's healthcare sector, information technology services in Sweden's growing market, alongside renewable energy, have recently changed the trade composition. Sweden's growing demand within these industries showcases the 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 positive 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 studies major aspects such as Indian quantum trade relationship analysis, trade trends and economic results with Sweden. The most important part of the analysis includes the evaluation of the index of India's trade intensity with India and the difference between the Swedish trade intensity with India, which helps to 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 emit light on how each country depends on other countries of income. In evaluating these factors, this study provides ideas for trade dynamics, potential growth areas and general economic interdependence of 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 and analyse this topic, several studies focused 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 Relation

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 the trade dynamics between India and Sweden, focusing on factors influencing bilateral trade, such as 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

Raghuramapatruni (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 exhibits lower values, suggesting that it maintains trade relationships with a more diversified set of partners and is not as reliant on India. Furthermore, an RCA analysis conducted by Raghuramapatruni (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 the importance of these nations as key export destinations. However, for Bahrain and Qatar, India's export intensity has been inconsistent, and its import intensity from these countries remains low, indicating a lower volume of imports. 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," although 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 one in the export of several products, signifying 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) explored trade relations between India and Malaysia, finding 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 the persistent trade deficit of Bangladesh with India, attributing it to export similarities 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 SAFTA (South Asian Free Trade Agreement) and increasing the list of sensitive commodities for mutual trade growth.
- **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) highlighted that despite an increase in trade volume, bilateral trade between India and New Zealand remains significantly lower than expected when compared to their respective global trade patterns.
- **India-USA Trade:** In his study, Kumar Ravi(2018) examined the trade relationship that India has 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 towards India, meaning that India has been exporting more than they are importing from the US. Additionally, he focused on the growing trade deficit between India and the US and noted that it has reached an unprecedented level, which can have serious repercussions on 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 with a focus on the exchange of significant goods and also assesses the Trade Intensity Index (TII). The study reviews the bilateral trade flows between India and the primary importing nations to determine how India's exports compare to 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 the level of trade 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 investigates the possibility of growing Indo-Sweden 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 important 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 percentage of global imports aimed at that partner (P), the TII is computed. Generally speaking, 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 higher than 100, it indicates that India imports more goods from Sweden than would be predicted, given Sweden's proportion 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:**

XIIist = [Xis / Xi] / [Ms/ (Mw- Mi)] * 100……. (1)
This specification defines India's Export Intensity Index (XII) about its trade with Sweden. The variables are interpreted as follows XIIist represents India's export intensity index with Sweden, Xis refers to India's exports to Sweden, Xi denotes India's total exports, Ms signifies Sweden's total imports, Mw represents total global imports, and Mi 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:**
MIIist= [Mis / Mi] / [Xs / (Xw- Xi)] * 100..... (2)
The MIIist represents India's Import Intensity Index about its trade with Sweden. The variables are defined as follows: MIIist refers to India's import intensity index with Sweden, Mis denotes India's imports from Sweden, Mi signifies India's total imports, Xs represents Sweden's total exports, Xw accounts for total global exports, and Xi 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 relatively higher rate compared to Sweden's overall export distribution worldwide.

c. **Export Intensity Index of Sweden's Trade with India:**
XIIsit= [Xsi / Xs] / [Mi/ (Mw- Ms)] * 100..... (3)
XIIsit represents the Export Intensity Index of Sweden's trade with India. It is calculated as follows: Xsi = Sweden's exports to India, Xs = Total exports of Sweden, Mi = Total imports of India, Mw = Total world imports, Ms = 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:**
MIIsit = [Msi / Ms] / [Xi / (Xw- Xs)] * 100..... (4)
MIIsit refers to the Import Intensity Index of Sweden's trade with India. Msi stands for Sweden's imports from India Ms for Sweden's total imports Xi for India's total exports Xw for global exports Xs 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 provides 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 mean values of two independent samples to determine if they originate from populations with different mean values. 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 in comparing two unrelated groups to evaluate whether their mean values significantly differ. 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, such as gender (e.g., male and female), while the test variable measures a quantitative characteristic, such as test performance. The independent t-test evaluates whether the mean value of the dependent variable for one group differs significantly from that of 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, which means that there should be 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 by one group won't affect those made by 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 is predicated on the assumption that the dependent variables variance is roughly equal in both populations. This guarantees that the statistical comparison between the two groups will always be valid and significant.

1. Data Analysis

1.1 India's Bilateral trade with Sweden

The trade relationship between India and Sweden has shown steady growth from 2004 to 2023, with fluctuations influenced by global economic events. 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 reciprocal trade balance. 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.

India's Trade with Sweden (2004-2023) US$ 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	232.026	923.182	1155.208	-691.156	0.25
2005	313.091	1037.156	1350.247	-724.065	0.30
2006	377.198	1850.023	2227.221	-1472.825	0.20
2007	486.117	1970.456	2456.573	-1484.339	0.25
2008	578.068	2166.943	2745.011	-1588.875	0.27
2009	468.6	1590.936	2059.536	-1122.336	0.29
2010	581.501	1469.486	2050.987	-887.985	0.40
2011	801.883	2016.924	2818.807	-1215.041	0.40
2012	698.204	1827.747	2525.951	-1129.543	0.38
2013	776.812	1673.389	2450.201	-896.577	0.46
2014	767.12	1743.045	2510.165	-975.925	0.44
2015	693.591	1583.107	2276.698	-889.516	0.44
2016	707.167	1191.631	1898.798	-484.464	0.59
2017	753.835	1394.647	2148.482	-640.812	0.54
2018	787.704	1366.035	2153.739	-578.331	0.58
2019	759.567	1173.565	1933.132	-413.998	0.65
2020	701.905	950.501	1652.406	-248.596	0.74
2021	999.621	1380.45	2380.071	-380.829	0.72
2022	1011.614	1686.988	2698.602	-675.374	0.60
2023	953.735	1917.365	2871.1	-963.63	0.50

Table I

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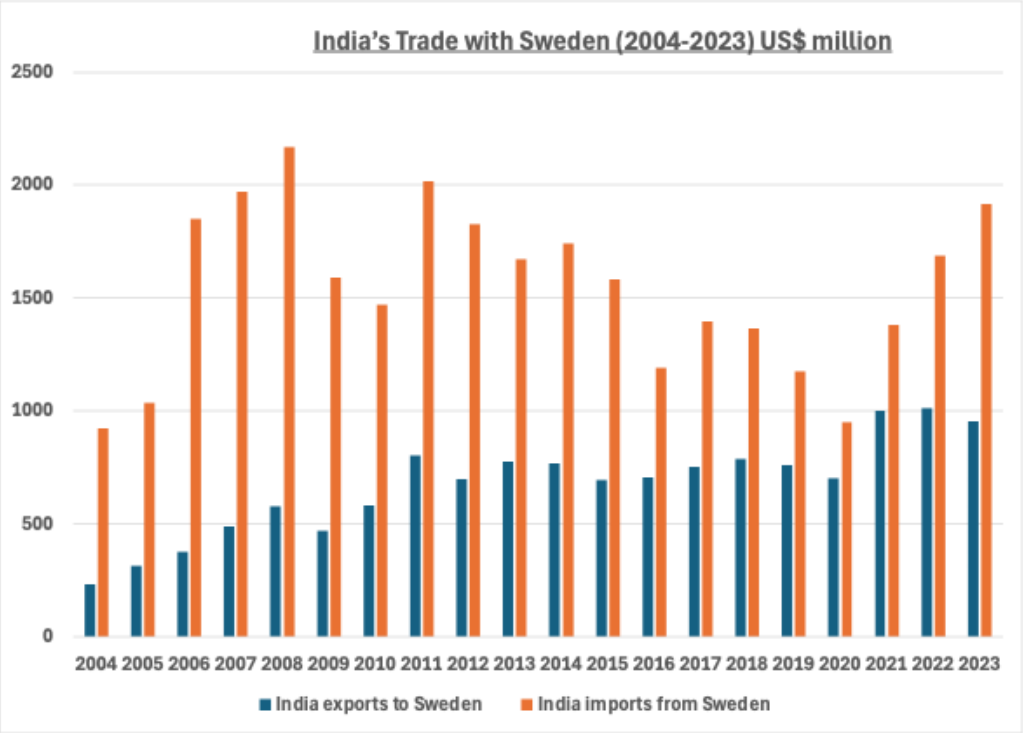

Figure I

1.1.1 **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 been higher than its exports, reflecting 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 witnessed nearly a 2.5-fold increase. 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 remained below 1, signifying that India imports significantly more from Sweden than it exports. The ratio demonstrated an improvement in relative balance, rising from point 0.25 in 2004 to point 0.74 in 2020. Nevertheless, it had reversed past gains by 2023, falling to 0. 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 as a result of growing 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 and reaching its highest point during that time. But between 2021 and 2023, the export-import ratio fell, and the trade deficit grew once more, 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

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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.

Sweden's Trade with India (2004-2023) 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	1130.974	309.604	1440.578	821.37	3.65
2005	933.718	387.981	1321.699	545.737	2.41
2006	1347.018	434.088	1781.106	912.93	3.10
2007	1589.468	594.843	2184.311	994.625	2.67
2008	1942.52	740.844	2683.364	1201.676	2.62
2009	1675.889	551.159	2227.048	1124.73	3.04
2010	1733.992	799.714	2533.706	934.278	2.17
2011	1908.755	1006.073	2914.828	902.682	1.90
2012	1442.017	771.213	2213.23	670.804	1.87
2013	1402.134	752.438	2154.572	649.696	1.86
2014	1441.123	787.885	2229.008	653.238	1.83
2015	1232.242	711.363	1943.605	520.879	1.73
2016	999.956	707.512	1707.468	292.444	1.41
2017	1154.116	754.807	1908.923	399.309	1.53
2018	1336.7	786.29	2122.99	550.41	1.70
2019	1233.918	768.746	2002.664	465.172	1.61
2020	964.161	705.03	1669.191	259.131	1.37
2021	1289.263	992.341	2281.604	296.922	1.30
2022	1579.072	1200.622	2779.694	378.45	1.32
2023	1654.413	1094.373	2748.786	560.04	1.51

Table II

Figure II

1.1.2 **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 more fluctuations compared to 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, there has been a general decline in the trade balance, 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 reduced margin compared to 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 later years, particularly between 2020 and 2022. Although Sweden has consistently maintained a trade surplus with India, this surplus has been gradually shrinking over time, peaking in 2008 before experiencing a steady decline. The decreasing export/import ratio further indicates a shift toward a more balanced trade relationship, as imports from India have been growing at a faster rate 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.

India's exports to Sweden (sorted on the latest year 2023 & above 1 US dollars million)

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Codes	Product	Value in 2019	Value in 2020	Value in 2021	Value in 2022	Value in 2023
TOTAL	All products	759.567	701.905	999.621	1011.614	953.735
84	Nuclear reactors, boilers, m	89.223	73.03	125.93	132.247	133.83
85	Electrical machinery and eq	43.315	43.638	67.203	63.913	103.785
62	Articles of apparel and clotl	91.368	71.791	78.328	98.683	91.484
87	Vehicles other than railway	49.568	42.981	64.92	68.26	77.628
61	Articles of apparel and clotl	53.859	44.774	56.764	61.719	47.286
63	Other made-up textile artic	47.202	42.5	66.838	62.177	46.298
73	Articles of iron or steel	33.754	31.984	51.14	50.53	45.449
90	Optical, photographic, ciner	16.874	12.029	20.05	28.228	39.57
57	Carpets and other textile flo	36.018	33.453	59.858	45.514	33.563
88	Aircraft, spacecraft, and pa	18.605	17.22	18.552	24.637	28.086
40	Rubber and articles thereof	22.921	25.772	34.408	24.615	27.146
30	Pharmaceutical products	14.967	24.848	24.539	18.661	26.259
29	Organic chemicals	15.532	19.876	33.563	30.824	23.1
71	Natural or cultured pearls, p	21.635	19.613	25.704	26.916	21.248
42	Articles of leather; saddlery	31.109	23.782	26.599	25.36	20.773
39	Plastics and articles thereof	15.62	17.772	25.875	22.772	18.139
76	Aluminium and articles ther	18.575	21.93	14.72	19.103	16.389
72	Iron and steel	12.068	8.609	24.421	18.927	15.122
94	Furniture; bedding, mattres	12.907	11.009	19.101	17.016	13.592
9	Coffee, tea, maté and spice	10.126	9.614	11.997	13.041	12.442
10	Cereals	5.906	4.938	3.872	4.799	11.033
74	Copper and articles thereof	4.879	4.909	8.816	7.779	7.486
82	Tools, implements, cutlery,	9.407	9.536	9.897	9.802	6.922
38	Miscellaneous chemical pro	5.495	5.376	12.972	7.244	6.3
83	Miscellaneous articles of ba	7.151	6.188	8.47	8.612	6.125
64	Footwear, gaiters and the li	7.634	6.087	7.322	7.068	5.92
95	Toys, games and sports requ	4.665	5.639	8.548	10.48	5.785
12	Oil seeds and oleaginous fru	4.908	3.921	4.308	3.72	5.156
24	Tobacco and manufactured	3.744	3.754	3.849	4.254	4.241
32	Tanning or dyeing extracts;	3.911	2.699	4.161	4.715	3.2
75	Nickel and articles thereof	1.085	1.424	1.706	2.047	3.126
44	Wood and articles of wood;	3.269	2.891	4.707	3.301	2.966
86	Railway or tramway locomo	3.713	11.491	27.468	29.546	2.931
20	Preparations of vegetables,	2.403	2.711	2.614	2.775	2.746
79	Zinc and articles thereof	1.99	1.441	1.742	1.873	2.739
33	Essential oils and resinoids;	1.896	1.864	3.079	2.619	2.597
70	Glass and glassware	3.368	2.764	4.44	3.165	2.431
69	Ceramic products	2.491	2.018	2.28	2.647	2.368
68	Articles of stone, plaster, ce	1.746	1.592	2.319	2.028	2.303
48	Paper and paperboard; arti	2.325	1.821	2.745	3.875	2.025
52	Cotton	1.025	1.796	2.048	2.423	1.98
56	Wadding, felt and nonwove	0.94	1.26	1.209	1.667	1.905
89	Ships, boats and floating str	0	0	0	0	1.729
7	Edible vegetables and certa	2.883	2.433	1.814	1.871	1.701
81	Other base metals; cermets	0.787	0.699	0.852	1.535	1.454
21	Miscellaneous edible prepa	0.922	0.832	1.106	0.839	1.402
96	Miscellaneous manufacture	0.656	0.725	1.12	1.158	1.385
46	Manufactures of straw, of e	1.096	1.518	1.656	1.55	1.303
8	Edible fruit and nuts; peel o	1.164	0.603	0.98	1.127	1.281
3	Fish and crustaceans, mollu	0.686	1.018	0.661	0.988	1.181

Table III

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

- Table III shows a breakdown of India's exports to Sweden across various product categories from 2019 to 2023. Let's analyse the data in terms of 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, with the value increasing 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, there was a dip in 2020, when exports fell to US$ 701.91 million, 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 experiencing a slight decline 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, fluctuating between US$ 22 million and 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) followed a fluctuating trend as well, peaking at US$ 19.10 million in 2021 but 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 like toys (HS 95), zinc (HS 79), and footwear (HS 64), with the highest in this segment—toys, games, and sports requisites—dropping 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, while lower-value products like furniture, ceramics, and paper products contribute a smaller share to the total export volume. These trends highlight the evolving nature of trade and the shifting competitiveness of different sectors.
- India's exports to Sweden have exhibited steady growth, primarily driven by machinery, electrical equipment, and apparel, which continue to show consistent expansion. 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 like 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.

Sweden exports to India (sorted on the latest year 2023 & above 1 US dollars million)

HS Codes-2 Dig	Description	2019	2020	2021	2022	2023
TOTAL	**All products**	**1233.918**	**964.161**	**1289.263**	**1579.072**	**1654.413**
84	Nuclear reactor	263.471	236.556	291.078	262.744	305.602
72	Iron and steel	148.121	122.599	180.15	258.693	271.683
87	Vehicles other t	97.16	71.578	94.366	130.243	198.234
47	Pulp of wood or	112.684	75.979	144.951	216.657	169.221
85	Electrical mach	181.605	91.262	116.97	130.191	158.966
48	Paper and pape	92.386	69.69	83.169	111.401	109.342
90	Optical, photog	52.997	38.504	56.784	50.978	54.938
38	Miscellaneous c	53.755	57.388	49.461	45.969	42.895
30	Pharmaceutical	19.934	24.491	37.006	27.848	42.262
74	Copper and arti	24.192	21.286	25.666	35.076	40.561
39	Plastics and arti	41.947	20.15	26.478	38.119	39.701
29	Organic chemic	21.428	25.401	42.774	69.146	36.252
82	Tools, implemer	19.077	22.885	34.462	38.949	32.757
73	Articles of iron	14.329	13.907	16.731	17.484	21.577
44	Wood and artic	9.271	4.459	6.805	14.961	19.793
76	Aluminium and	8.751	9.582	10.238	14.755	19.432
75	Nickel and artic	10.689	12.332	14.139	11.226	19.257
40	Rubber and arti	9.509	8.519	11.569	14.746	13.027
22	Beverages, spiri	4.128	3.945	6.569	9.661	9.97
28	Inorganic chem	5.88	6.094	4.702	5.552	8.116
79	Zinc and article	0.863	0.915	4.632	9.392	6.919
32	Tanning or dyei	2.948	3.485	3.715	4.093	4.031
86	Railway or tram	5.719	6.027	4.37	2.164	3.44
34	Soap, organic su	4.96	3.532	5.789	3.561	3.096
68	Articles of stone	1.382	1.552	2.434	3.119	2.382
88	Aircraft, spacec	0.746	0.277	0.12	0.177	2.365
70	Glass and glassv	2.003	1.223	2.114	3.392	2.185
94	Furniture; bedd	1.093	0.988	1.174	1.218	1.946
23	Residues and w	0.003	0.263	0.678	0.513	1.516
95	Toys, games an	0.641	0.31	0.324	1.104	1.133

Table IV

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 shown a significant increase, rising from US$ 1.23 billion in 2019 to US$ 1.65 billion in 2023, reflecting a growth of approximately 34.4% over five years. Although there was a decline in 2020, with exports falling 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% growth due to 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 particularly strong 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 consist of both high-value and low-value categories, each displaying distinct trends. Among low-value exports, toys, games, and sports requisites (HS 95) saw a gradual increase 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 such as 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, while 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.

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

Export Intensity Index of India’s Trade with Sweden	**XIIist**
Import Intensity Index of India’s Trade with Sweden	**MIIist**
Export Intensity Index of Sweden’s Trade with India	**XIIsit**
Import Intensity Index of Sweden’s Trade with India	**MIIsit**

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

Table V

1.2.1 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 for both exports and imports. The four indices provided in the table are:

- **XIIist**: Export Intensity Index of India's trade with Sweden.
- **MIIist**: Import Intensity Index of India's trade with Sweden.
- **XIIsit**: Export Intensity Index of Sweden's trade with India.
- **MIIsit**: Import Intensity Index of Sweden's trade with India.
- As in table V indices are calculated based on the share of each country's trade with the partner country relative to their total global trade, and they reflect the importance of trade between India and Sweden in the context of their total trade activities.
- **Export Intensity Index of India's Trade with Sweden (XIIist):** The XIIist 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 the relative importance of India's exports to Sweden, despite some fluctuations in intermediate years.

- **Import Intensity Index of India's Trade with Sweden (MIIist):** The MIIist index has been consistently higher than the XIIist, 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 around the 30–40 range. 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 (XIIsit):** The XIIsit index for Sweden's exports to India has fluctuated significantly, peaking at 86.28 in 2004 before experiencing a sharp decline 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 stabilized 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 (MIIsit):** The MIIsit 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, varying between 28 and 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 between 28 and 38 and export indices between 26 and 35, the trade relationship is still significant. A more balanced import relationship is suggested by the MIIist and MIIsit indices increased stability over the last ten years. In the meantime, the declining XIIist and XIIsit indices show a change in trade priorities with India-Sweden trade playing a smaller but still significant role in their larger global trade dynamics. Trade flows are still substantial despite this drop with recent stabilisation and modest growth in sectors like Sweden's imports to 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:
- **Comparison of Export Intensity**: India's Export Intensity Index with Sweden has a mean of 28.36 with low variability (standard deviation of 1.52), while 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 like trade policies, demand shifts, or industry-specific changes, whereas India's trade intensity remains stable, likely due to 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 predictions, and long-term trade relationship evaluations.
- These insights can help trade policy decisions, predict market stability, and evaluate long-term trade relationships.

1.3 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.

	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

Table VII

Interpretation:

1. **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.
2. **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.
3. **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 intensively to India than vice versa.
4. **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 stronger trade intensity with India, indicating an imbalance in 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 dependence on Swedish imports by encouraging domestic production in key sectors can contribute to a more balanced trade relationship. 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.

1.4 Group Statistics of Import Trade Intensity

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

Table VIII

Table VIII presents the Group Statistics of Import Trade Intensity between India and Sweden. Here's an analysis of the data:

- **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 compared to how 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):** The standard deviation for India's import intensity index is 16.24, whereas for Sweden, it 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 exhibits higher volatility, whereas Sweden's import intensity 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 a steady and 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.

1.5 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.

t value and Significant 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

Table IX

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 equal variances are not assumed, 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 has a statistically significant difference**.** The results suggest that trade intensity is not equal and could be influenced by various economic and policy-related factors

2. 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 seeing improvements in the export-import ratio. According to the Trade Intensity Index, trade between the two countries is still a vital part of their overall trade portfolios despite a slight decline in relative importance. Furthermore, the MIIsit index continues to hold a higher value than the XIIist index, indicating the growing importance of Sweden's imports into India. India can employ strategic policies like export sector diversification, bilateral trade agreement strengthening, and increased domestic manufacturing to improve its market access in Sweden to rectify 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 stayed relatively stable, Sweden's trade patterns have shown more volatility despite having a stronger trade intensity with India. India-Sweden trade continues to be a stable and essential component of their economic interactions despite the lower trend of both country's Export Intensity Index, which is consistent with broader changes in the dynamics of global trade. 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 help forecast market stability, create trade policies, and fortify enduring trade relationships. With steady Swedish imports and ongoing growth in Indian exports, Sweden is predicted to continue to be an important trading partner for India in the future. Trade relations are set to further develop as both countries place a strong emphasis on technology, pharmaceuticals, and sustainable energy, which will promote cooperation driven by innovation 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 important industries like textiles, IT, and pharmaceuticals, which would promote 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 concentrate on creating long-term contracts and sustainable supply chains to guarantee steady export trends. 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: I**ndia 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 food, 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 in smart grids, waste management technologies, and green construction to India. 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. Defense & 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 centres in India, supporting India's growing electric mobility sector

3.Conclusion

Sweden is an important 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 swings, and trade agreements are some of 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 like toys and shoes have only slightly increased. 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 to Sweden's higher but more volatile trade intensity with India, India's trade intensity with Sweden is lower but more stable. This disparity highlights the need for India to strategically increase its trade presence and points to an imbalance in export priorities. India's market position could be strengthened by increasing exports in high-growth sectors like 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 lessen its dependency on Swedish imports by promoting domestic manufacturing in important sectors. Even though trade between Sweden and India is more intense, there are still fluctuations that could affect the stability of trade 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 India-EU negotiations could be implemented. Furthermore, cooperation in cybersecurity AI and smart cities via a Sweden-India Digital Alliance may open up new avenues for expansion.

2. Policy Recommendations for Strengthening India-Sweden Trade

- **Bilateral Trade Agreements:** To boost trade, a Free Trade Agreement (FTA) between India and Sweden under 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 exports 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.
- I**nvestment & Ease of Doing Business:** Sweden can increase **foreign direct investment (FDI)** in India, particularly in automobiles, automation, and renewable energy. 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.

References

1. Alam, I., & Ahmed, S. (2015). India-Saudi Arabia bilateral trade relations: Recent experiences and future opportunities. *International Journal of Economics and Empirical Research, 3(7),* 327-342.
2. Alam, I., & Ahmed, S. (2017). Demystifying the puzzle between India-UAE Trade: An analytical study. *The Empirical Economics Letters, 16*, 12.
3. Bano, S., & Paswan, N. K. (2010, June). India-New Zealand trade and trade potential: Recent experience and future opportunities. In *51st New Zealand Association Of Economists (NZAE) Annual Conference University Of Auckland Bu,siness School On* (Vol. 30).
4. Bano, S., & Paswan, N. K. (2016). New Zea,land–India trade relations and growth potent'ial: An empirical analysis. *India Quarterly, 72(1),* 50-74.
5. Basu, S., & Datta, D. (2007). ,India-Bangladesh trade relations: Proble,m of bilateral deficit. *Indian Economic Review*, 111-129.
6. Bhattacharya, S. K., & Bhattacharyay, B. N. (2007). Gains and losses of India-China trade cooperation—A gravity model impact analysis.
7. Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. routledge. Das, P. K., & Pr,adhan, 'S. R. (2014). India-Gulf trade relations. *IOSR Journal of Economics and Finance, 4(1),* 31-41.
8. Drysdale, P., & Garnaut, R. (1982). Trade intensities and the analysis of bilateral trade flows in a many-country world: A survey. *Hitotsuy'shi Journal of Economics,,* 62-84.
9. Embassy of India in Sweden. (2023.). India-Sweden Relations. Retrieved from https://www.indembassysweden.gov.in/p,age/india-sweden-relations/
10. Embassy of Sweden in India (2023). Trade between Sweden and India. Retrieved from https://www.swedenabroad.se/en/about-sweden-non-,swedish-citizens/india,/business-and- trade-with-sweden/trade-between-sweden-and-india/
11. Eriksson, L., & Ehn, R. (2023). Explaini,ng the trade relation between India and Sweden in the 21st century.

12. Folfas, P. (2010). The intensity of bilateral relations in intra-EU trade and direct investments: Analysis of variance a,nd correlation.
13. , Frankel, J. A. (1997). *Regional Trading Blocs in the World Economic System.* Institute for International Economics.
14. Garg, S. (2016). India's trade potential and prospects with Sri Lanka: 1991 to 2015. *South Asian Survey, 23(2),* 93-118.
15. Goyal, K. A., & Vajid, A. (2016). An analysis of bilateral trade between India and UAE. *Pacific Business Review International, 1(2),* 94-100.
16. Khalid, N., & Ismail, S. (2020). India-Malaysia economic relations: An empirical analysis of trade dynamics. *Indian Journal of Economics and Development, 16(3),* 345-354.
17. Khan, M. (2013). India-Pakistan Trade Relations. *New America Foundation,* 2-15.
18. Kien, T. N., Kien, T. N., Lee, H. R., & Heo, Y. (2010). Dynamic patterns of Korea-Vietnam trade relations. *International Area Review, 13(2),* 257-279.
19. Kojima, K. (1964). The pattern of international trade among advanced countries. *Hitotsubashi Journal of Economics, 5(1),* 16-36.
20. Maryam, J., & Mittal, A. (2019). An empirical analysis of India's trade in goods with BRICS. *International Review of Economics, 66(4),* 399-421.
21. Mazlan, H., Hassan, A., Azman-Saini, W. N. W., Yusof, R. N. R., & Awang, K. W. (2018). A measure of trade intensity and country market potential. *International Journal of Economics & Management, 12(2).*
22. Mo, P. H. (2010). Trade intensity, net export, and economic growth. *Review of Development Economics, 14(3),* 563-576.
23. Mohajeri, P. (2015). Trends of India trade with Persian Gulf countries. *Indian Journal of Applied Research, 5(9),* 199.
24. Product-Market Identification Application. (2013). Retrieved from http://www.gmspmi.com/index.php?Content=Page&PageID=10 on May 11, 2017.
25. Paswan, A. S. (2021). INDIA'S BILATERAL TRADE WITH CHINA-EMPIRICAL STUDY BASED ON TRADE INTENSITY INDEX & TRADE RECIPROCITY INDEX. *Studies in Economics and Business Relations*, *2*(1), 1-16.
26. Raghuramapatruni, R. (2014). A study on the trade patterns between India & China: With a special focus on services trade. *Indian Ocean Digest, 33(1),* 56-81.
27. Raj, P. S., Wing, E. C. O. N. O. M. I. C. S., & Ambrose, D. (2014). A brief analysis of India-Japan bilateral trade: A trade intensity approach. *International Journal of Economics, Commerce and Management, 2(2).*
28. Singh, M. (2023). India and Sweden: A Rollercoaster Relationship. In *India and Europe in a Changing World: Context, Confrontation, Cooperation* (pp. 291-325). Singapore: Springer Nature Singapore.
29. Srivastava, R. K., & Green, R. T. (1986). Determinants of bilateral trade flows. *Journal of Business,* 623-640.
30. Sundar, R. P., & Ambrose, B. (2014). A brief analysis of India-Japan bilateral trade: A trade intensity approach. *International Journal of Economics, Commerce and Management, 2(2).*
31. Sweden Abroad. (2022). Trade between Sweden and India. Retrieved from https://www.swedenabroad.se/en/about-sweden-non-swedish-citizens/india/business-and-trade-with-sweden/trade-between-sweden-and-india/
32. Trading Economics. (2023). India Exports to Sweden. Retrieved from https://tradingeconomics.com/india/exports/sweden
33. Understanding the Independent Sample t-test. (n.d.). Retrieved on June 5, 2017, from
34. http://oak.ucc.nau.edu/rh232/courses/EPS525/Handouts/Understanding%20the%20Independent%20t%20Test.pdf
35. Wikipedia. (2023). India–Sweden relations. Retrieved from https://en.wikipedia.org/wiki/India%E2%80%93Sweden_relations