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ERIA-CII-ISID Study on India–Japan Economic Partnership for Resilient and Diversified Value Chains

Edited By

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ERIA-CII-ISID Study on India–Japan Economic Partnership for Resilient and Diversified Supply Value Chains

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Executive Summary

The Economic Research Institute for ASEAN and East Asia (ERIA), the Confederation of Indian Industry (CII), and the Institute for Studies in Industrial Development (ISID) established the India–Japan Platform for Supply Chains and Investments in 2024, in which the Association of Southeast Asian Nations (ASEAN) and Australia are important constituents. The initiative began with a research study to fulfil the knowledge component of this platform and mobilise technology cooperation and investment facilitation by bringing in businesses, business associations and policymakers.

The *ERIA CII ISID Study on India–Japan Economic Partnership for Resilient and Diversified Value Chains* builds on the 2023 Group of Twenty (G20) Leaders' Declaration and the Group of Seven (G7) Leaders' Statement, which emphasised the need for resilient, diversified, trustworthy, and transparent supply chains amongst developing and developed economies. The G20 leaders adopted a framework for keeping critical GVCs resilient and robust. Analysis of data, collaboration, coordination, preparedness, and inclusion and sustainability are some of the high-level principles adopted by the G20 that can guide like-minded countries towards resilient and reliable supply chains. The India G20 Presidency also brought into focus the role of the Global South in the new supply chains of goods and the digital economy. The G7 Hiroshima Leaders' Communique reached out to emerging and developing countries in Asia – which are the key players in global supply chains and the key stakeholders in a rules-based trading system with fair and transparent markets. The ASEAN Community and India are two significant members of developing Asia that have both the capacity and quality to fulfil the drive towards resilient and trustworthy supply chains amongst G7 and non-G7 members. India–Japan cooperation with ASEAN and Australia is an important component for manufacturing and critical mineral supply chains, and is the basis for this analysis of regional and global value chains and economic security issues.

This study is a ready reckoner for businesses, policymakers, and academics to understand the basic principles of global or regional value chains; their distribution, density, and the resultant efficacy in the Indo-Pacific region; and the competition between established and diversified GVCs for economic and strategic security. Trade and GVC integration data are cited to support the current GVC scenarios in the region, and investment data for GVC infrastructure support the policy prognosis on diversified and resilient GVCs, as well as the direction of economic security and strategic cooperation in the Indo-Pacific region. The study also assesses the current policy deficits in the global trading regime, especially those emanating from the United States (US) and uncertainties in global trade governance systems.

Chapter 1 assesses the current state of global supply chains in terms of their concentration – and much-needed diversification. It reviews the opportunities and challenges in the India–Japan economic partnership in this context, and recommends a

policy agenda for harnessing its potential. The chapter also discusses the extent of concentration of global supply chains, the global trend of diversification, and the advantages of India in rebuilding supply chains.

It summarises the steady deepening of the India–Japan strategic partnership and shows how the bilateral economic partnership has yet to fulfil the potential of the close political engagement between the two countries.

The chapter provides an overview of the global supply chains of traditional and sunrise industries that have come to be dominated by China. Amongst labour-intensive industries, China dominates global manufacturing with a 70% share. In green sunrise sectors, China's domination is even more complete, with over 80% of all stages of solar photovoltaic (PV) panel manufacturing, 76% of lithium-ion batteries, 60% of global wind turbine capacity, and 62% of global electric vehicle (EV) production. China also accounts for 75% of the global output of mobile phones, smartphones, and laptops; and holds a dominant position in the global critical minerals supply chain, processing over 85% of the world's rare earths.

Several leading industrialised countries, including the US and European Union (EU) Member States, are pursuing industrial policies to enhance supply chain resilience through onshoring/friend-shoring. In the US, industrial policy has become the 'New Washington Consensus' – a bipartisan consensus for pursuing aggressive economic nationalism while prioritising strategic industrial policy. This shift marks a significant departure from the Washington Consensus of the late 1980s, which emphasised globalisation, deregulation, and the virtues of free markets. The Trump administration 2.0 is taking this approach to new levels to rebuild domestic manufacturing capabilities.

The EU has followed up with its own industrial policy initiatives such as the Green Deal Industrial Plan for the Net-Zero Age; the Critical Raw Materials Act, 2023; and the European Battery Alliance, a collaborative network promoting battery research and subsidised manufacturing across Europe. The EU adopted the Carbon Border Adjustment Mechanism in December 2022 to support its climate goals, but it has been widely criticised as unilateral, protectionist, and discriminatory – adopted to protect domestic industries. The EU has also followed the US in imposing additional tariffs on imports of EVs from China.

Japan launched the US$2 billion Supply Chain Diversification Programme in 2020 to help Japanese companies diversify and reduce their dependence on China by providing subsidies that incentivise companies to onshore or reshore their operations to friendly countries in ASEAN. In the second phase, India and Bangladesh were added to the list of countries eligible for reshoring incentives. Japan's Economic Security Promotion Act, 2022 aims to enhance the resilience of supply chains. Under the Supply Chain Diversification Programme, incentives have been provided to several companies to reshore manufacturing projects – mainly in Viet Nam, but also in Indonesia, Malaysia, Thailand, and India.

In this context, India–Japan supply chain networks and investments are entering a significant phase where opportunities abound for both countries. However, despite their historical and economic linkages, India–Japan relations have not realised their full potential.

Advantage India

India offers several advantages to global industries, especially those from Japan, in terms of building alternative supply chains and making the country an important new manufacturing hub.

It offers a large and fast-growing domestic market, with robust growth of around 6.5% during 2015–2025. India's relatively young population, with a median age of 28 years, is a demographic dividend both for the country and investors. This contrasts with rapidly ageing populations in most industrialised countries, such as Japan and European countries, as well as newly industrialised countries, such as the Republic of Korea (henceforth, Korea) and China. India offers a geopolitical advantage in the ongoing industrial restructuring of global supply chains to reduce heavy dependence on one source – China. India enjoys a geopolitical advantage in attracting this supply chain restructuring, given its friendly relations with major industrialised countries in both the West and the East, including free trade agreements or comprehensive economic partnership agreements (CEPAs) with Japan, Korea, Australia, ASEAN, the United Arab Emirates, the European Free Trade Association (EFTA) countries, and the agreement concluded with the United Kingdom in July 2025, amongst others, as well as ongoing negotiations with the EU and the US. The emergence of India as the second-largest player in mobile phone assembly, with Apple and Samsung locating their assembly lines in the country, reflects the potential of positioning itself as an alternative supply chain destination.

India's information and communication technology (ICT) software and chip design capabilities are yet another advantage for Indian manufacturing and to build an ecosystem for electronics and semiconductors. The start-up ecosystem and technology-driven entrepreneurship complement these capabilities. These advantages are seamlessly supplemented with improved logistics infrastructure and industrial corridors for industrialisation. This includes cross-border economic corridors to enhance trade amongst India, Southeast Asia, West Asia, and Europe. A revamped Special Economic Zone (SEZ) programme with distinct economic regulations is an important component of India's industrialisation programme. The Make in India programme brings the focus back on building manufacturing capacities.

India–Japan Ties Are Stable and Special

Since 2005, India and Japan have held annual prime ministerial summits. In 2006, during the visit to Japan of Prime Minister Manmohan Singh, the bilateral relationship was

elevated to a Global and Strategic Partnership. The India–Japan CEPA was signed in 2011 and has been in force since then. In 2014, during the visit of Prime Minister Narendra Modi to Japan, the two countries agreed to upgrade their relationship to a Special Strategic and Global Partnership. In 2015, during Prime Minister Shinzo Abe's visit to New Delhi, the two prime ministers resolved to transform the India–Japan Special Strategic and Global Partnership into a deep, broad-based, and action-oriented partnership, reflecting the broad convergence of their long-term political, economic, and strategic goals towards peace and prosperity in the Indo-Pacific region and the world. In 2022, during the visit of Prime Minister Fumio Kishida to India, the two countries formulated a roadmap for the India–Japan Industrial Competitiveness Partnership (IJICP) and launched the India–Japan Clean Energy Partnership. Besides bilateral engagement at the leaders' level, India and Japan have 2+2 Ministerial Dialogues with ministers of foreign affairs and defence from both countries. In addition, they set up the India–Japan Act East Forum. India and Japan are also members of the Quadrilateral Security Dialogue (Quad), which comprises four countries: Australia, India, Japan, and the US. The Quad's primary goal is to foster a free, open, and prosperous Indo-Pacific region by collaborating on issues like security, trade, and disaster relief.

The India–Japan CEPA is one of the most comprehensive such agreements signed by India, covering trade in goods, services, the movement of natural persons, intellectual property, government procurement, competition, the business environment, and cooperation. It has been in force since 2011 and targeted the abolition of tariffs on 94% of items over 10 years.

Potential Gap Needs to Be Addressed

The deepening of India–Japan political and strategic engagement in bilateral, regional, and multilateral forums, however, has not resulted in a deepening of economic partnership. India's bilateral trade expanded from US$15 billion–US$16 billion per year in 2013–14 to around US$22 billion in 2023–24. However, the growth largely represents rising imports to India from Japan, up from around US$9 billion–US$10 billion in 2013–14 to around US$17 billion in 2023–24. India's exports to Japan have fallen in absolute terms from around US$6 billion per year in 2013–14 to US$5 billion a decade later. The trade deficit widened from US$2.67 billion in 2013–14 to US$12.54 billion in 2023–24. Japan's share in India's total imports of electronic products as well as automobiles has fallen, while the share of China, ASEAN, and Korea has risen.

Amongst the Indian products that benefited from the CEPA are fish items including shrimps and fish meat, organic chemicals, ferroalloys, dyes and pigments, woven garments, and castor oil. However, the CEPA did not help in enhancing India's exports of garments, footwear, and leather products due to the regulatory factors applicable in Japan. Article 13 of the CEPA on Economic Cooperation was not leveraged adequately for improving product quality and the ability of Indian exporters to comply with Japanese

market specifications and standards. The potential for mutually beneficial trade between India and Japan, especially for India's exports, remains untapped despite a functional India–Japan CEPA, especially for labour-intensive products such as textiles and garments, leather goods and footwear, processed foods, gems and jewellery, furniture, and toys, amongst others, which Japan imports in very large quantities from China and Viet Nam. The trend of reshoring of supply chains by Japanese companies to India is not evident despite the growing stature of the bilateral partnership, a functional CEPA, India's large and expanding market and skilled workforce, improving infrastructure and ease of doing business, and incentives offered by the Japanese and Indian governments.

Japan has been an important source of foreign direct investment (FDI) inflows globally and to India. It has been the fifth largest source of FDI to India, bringing in $43 billion between 2000 and 2024. Japan's share in India's total FDI of US$667 billion received during the same period is 6.4%. Although Japan's share of FDI in India, at 6%, is higher than its share in India's trade, it remains below potential given Japan's position as a major global source of FDI.

The size of Japanese FDI inflows is surpassed by some Japanese companies, which have made India an important part of their GVCs. Suzuki Motor Corporation's Indian subsidiary, Maruti Suzuki India Limited, is a crucial part of the company's global operations, serving as a major production and export hub, especially for passenger vehicles, with cumulative production exceeding 30 million vehicles. Similarly, Toyota's India operations are a vital part of its global strategy.

India could be an important base for the supply chain reshoring of Japanese companies, given the deepening strategic engagement of the two governments, their shared democratic values, and complementary demographics, specialisation, and resources.

The potential of India–Japan economic partnership for supply chain restructuring requires some important interventions:

- Create an India-focused dedicated fund to support Japanese FDI in India under the Supply Chain Diversification Programme: Although investments in India are eligible for support under the US$2 billion Supply Chain Diversification Programme, the bulk of the funding has gone to support investment projects in Viet Nam and other ASEAN Member States (AMS). A separate India-focused fund of US$2 billion could be earmarked to incentivise Japanese investments in India for (i) labour-intensive industries (e.g. textiles and garments, footwear, toys, food processing, and furniture); and (ii) sunrise sectors (e.g. electronics and semiconductors, solar PV, advanced batteries, EVs, electrolysers, wind turbines, machine tools, machinery, shipbuilding, and other heavy industries).

- Review of India–Japan CEPA to make it effective: The India–Japan CEPA requires a review in consultation with businesses in both countries to identify the non-tariff and process-oriented barriers that Indian exporters face in exporting labour-intensive goods to Japan, and to recommend the need for capacity building, especially of micro, small, and medium-sized enterprises (MSMEs), to comply with those standards.
- Targeting of Japanese companies by Indian investment promotion agencies: Invest India should tap Japanese multinational companies that specialise in India's priority sectors but do not yet have operations in India. Retail giants such as Daiso could help to develop a vendor base of Indian MSMEs, helping them to integrate into global supply chains.
- Fostering policy research on India–Japan supply chain restructuring: The criticality of supply chain diversification, especially in the context of the global trade policy uncertainties, requires sustained efforts aimed at understanding the emerging opportunities and highlighting the policy measures to realise them in a mutually beneficial manner. The creation of centres of advanced policy research on India–Japan economic partnership and supply chain resilience in India and Japan are the way forward.

Supply chain resilience is critical in the context of India–Japan economic partnership through the creation of alternative supply chains by leveraging their complementary strengths and synergies. This also contributes to India's economic development and the creation of decent jobs for its youthful workforce.

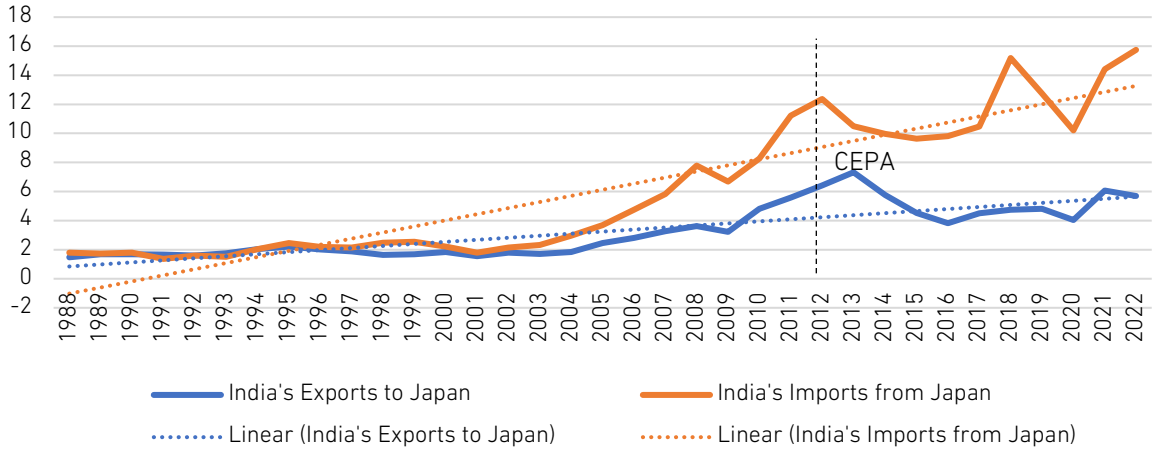
Chapter 2 explores the potential of India–Japan trade relations in a way that both partners complement each other's sectoral advantages and reap shared benefits. Trade opportunities are discussed in the framework of promoting India's participation in GVCs with Japan, which is critical for promoting a trade balance between the partners on a sustainable basis. Since the signing of the CEPA, India's imports from Japan increased at a reasonably good pace. Many of the imports from Japan, however, were intermediate goods (followed by capital goods), which could have directly and indirectly influenced India's higher participation in GVCs, thereby promoting its manufacturing capabilities, increasing gross domestic product and job creation, and unlocking its export potential. India has increasingly been both importing and exporting intermediate goods to Japan, and this needs to be expanded to foster GVC linkages. On India's exports front, capital goods have a share below 20%, which must be enhanced for India to move up and lead at upper ends in GVCs. Imports of capital goods are a good proxy indicator for promoting rapid economic development, especially when a country is at the lower stages.

Trade relations between India and Japan should be viewed in the context of their global participation, where they are important players. In 2022, India's global trade was $1.2 trillion whereas that of Japan was $1.6 trillion. Since 1988, India's exports and imports from Japan had been around the same level and largely remained stagnant until around 2001. Once India's global trade started picking up post-2001, its imports grew much faster

than its exports to Japan and the gap has continued to widen over the years. In 2022, India imported around three times more than its exports to Japan.

Another notable trend is that trade between the two countries started to pick up a few years prior to the signing of the CEPA in 2011. There is not much evidence to show that the CEPA has been particularly successful in bringing about incremental change in bilateral trade, at least from India's point of view. This is also evident because India's exports to Japan as a share of its global exports have assumed a sharp declining trend in the post-CEPA years (Figure 1).

Figure 1: Bilateral Trade Between India and Japan
(US$ billion)



CEPA = Comprehensive Economic Partnership Agreement.
Source: World Bank (n.d.).

GVC Participation

Intermediate goods, followed by capital goods, are an important part of imports from Japan. India has increasingly been both importing and exporting intermediate goods to Japan, and this needs to be expanded to foster GVCs linkages.

The GVC participation indexes for India and Japan for 2020 have been estimated at the sectoral as well as aggregate levels. India's participation in GVCs through backward linkages is estimated to be 17.2%, higher than the corresponding values of Japan (13.3%) and Australia (9.4%) but lower than the value of ASEAN (30.9%). India must continue to strengthen its backward linkages as it is found to be especially useful for developing countries in promoting exports, domestic value added, and employment.

India's manufacturing sector shows strong backward linkages of 27.0%, much better than those of Australia (14.1%) and Japan (16.8%). However, the forward linkages cause concern. Their value is only 9.5% compared with 21.0% for Australia, 18.8% for Japan, and 10.6% for ASEAN. This indicates the need for a great deal of effort towards promoting its exports of intermediate goods to be better connected in GVCs.

India's GVC performance in the service sector is comparable to Australia and Japan in both backward and forward linkages, reflecting its competitive strength in information technology (IT) and business process outsourcing sectors. The country's forward linkages and backward linkages in services were 7.1% for IT and 8.2% for business process outsourcing. ASEAN's superior integration in backward linkages, at 27.7%, could be taken as a benchmark for India to aspire to, especially given the growth of Global Capability Centres in the country.

India and Japan are well positioned to emerge as pivotal players in the global economy, leveraging their complementary strengths through strategic partnerships. To enhance trade cooperation further, the following measures are suggested:

- Diversification of trade baskets
- Addressing India's unfavourable trade balance
- Addressing key non-tariff barriers
- Enhancing trade facilitation
- Simplifying rules of origin
- Using FDI for export growth
- Economic and technical cooperation in manufacturing
- Developing intra-regional supply chains
- Collaboration with local firms

India and Japan must now focus on leveraging their economic complementarities more strategically, transforming their trade relationship into a more balanced and forward-looking partnership. With continued collaboration in technology, innovation, and supply chain resilience, the two countries can redefine their bilateral trade trajectory in a way that it is mutually beneficial to both the partners.

ASEAN: An Important Link in GVCs and Investments in India

India's weight in the global economy has expanded rapidly, from 1.5% in 2002 to 3.5% in 2022. This growth is mostly driven by domestic demand. Exports have stagnated, with the share of global merchandise exports remaining as low as 1.8%. India could tap into huge external demand if it can increase its international competitiveness and integrate more into global supply chains.

Chapter 3 reviews the GVC performance and integration of India and Japan, both regionally and bilaterally. However, India–Japan supply chain linkages must also include linkages with ASEAN, which is a major manufacturing and investment destination for Japan and other large economies such as China, Korea, the EU, and the US. Data on such

GVC participation have been analysed to filter the exports and imports of intermediate goods, which feed other countries' exports. The focus on trade in intermediate goods allows us to count the value added embedded in exports of the reporting country/region and elucidates the degree of integration in the value chains of trading partners. The findings show the trajectory of India's GVC participation, where India has been gaining ground and adding more value to GVCs, and its reliance on foreign value added has also significantly dropped thanks to continuous FDI inflows that have bolstered the domestic supply chains.

Japan promoted the original equipment manufacturer (OEM) revolution in Southeast and East Asia. The competitiveness of ASEAN's exports and its manufacturing prowess are largely due to the early FDI from Japan in AMS during the 1970s and 1980s, particularly in Thailand and Indonesia, and later in Viet Nam for the automobile and electronics industries. Japan's investments in India, however, have only recently seen an upswing in the manufacturing sector (as reported in Chapter 1). With Japan ranking fifth amongst the source countries for FDI and accounting for 6% of total FDI in India, Japanese FDI in India has mainly been in the electrical equipment, general machinery, chemical and pharmaceutical, financial and insurance, construction, transportation, wholesale and retail, and services sectors. On the other hand, ASEAN has been consistent in GVC participation but with huge dependence on China for both exports and imports, with more dependence on imports from China or backward participation in the GVC vis-à-vis China.

India has improved its GVC participation in several industries, such as chemicals, pharmaceuticals, machinery, and automobile parts and engines. India has also made much progress in global service value chains, especially in the ICT sector, in which India now creates 7% of global value added, only behind China in emerging markets.

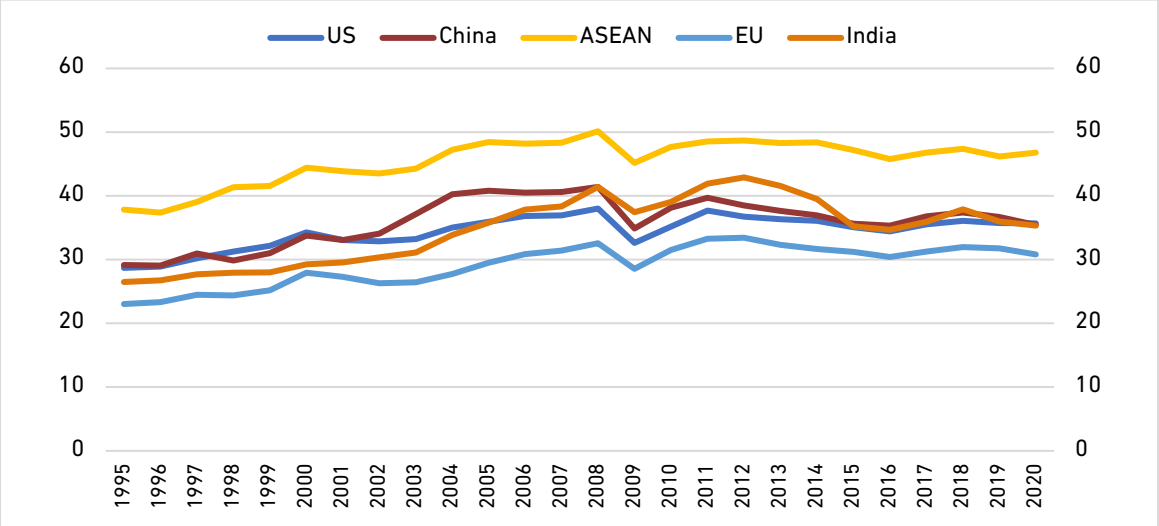
India is expected to continue its rise in GVCs, with its promising demography and the prevailing de-risking strategies in major economies regarding China. ASEAN too has an opportunity to consider structural adjustments and corrections in its GVC map, with greater integration with India and Japan than before. The review of the ASEAN–India Trade in Goods Agreement presents an important opportunity for reducing barriers to trade with ASEAN and greater integration with ASEAN both in trade and FDI. In an increasingly protectionist world, regional and trans-regional trade deals are increasingly important means for improved trade relations and supply chain integration.

Global Developments in GVCs

Globally, the size of GVCs peaked in 2008. Globalisation trends have recently halted, if not started reversing. Important members of the Indo-Pacific, such as Australia, India, Japan, the US, and the EU, have seen moderate improvements in GVC participation since 2016. For AMS, many of which are now members of the Regional Comprehensive Economic Partnership (RCEP), the Indo-Pacific Economic Framework for Prosperity (IPEF), and the

Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the trend is similar, but their level of integration into GVCs is much higher than for several other Indo-Pacific countries, including India (Figure 2).

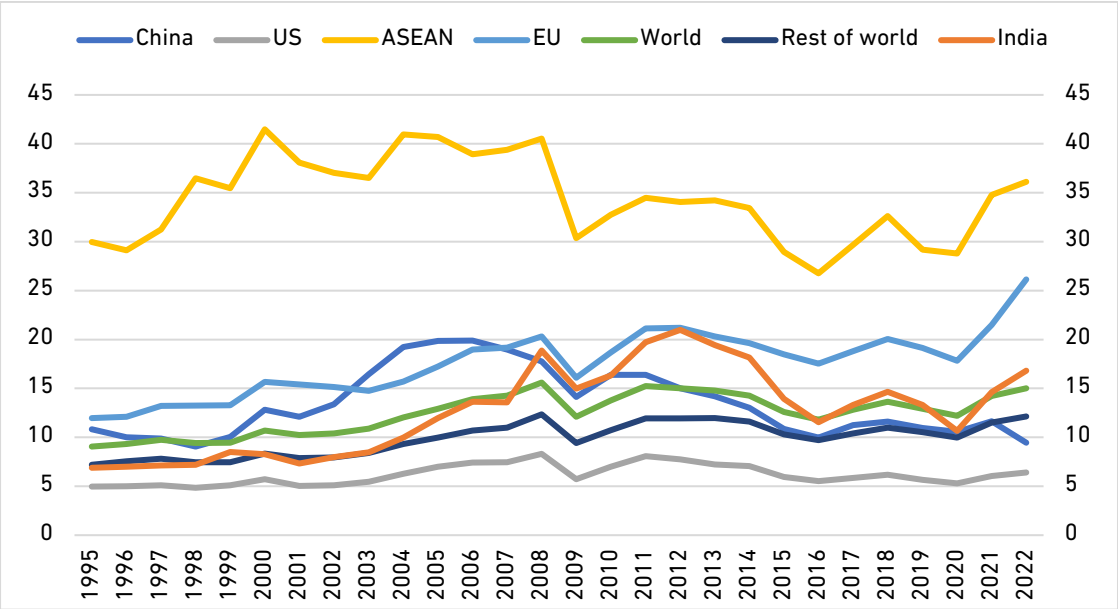
Figure 2: Total Global Value Chain Participation with the World
(% of gross exports)



ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (4 July 2024).

Since the global financial crisis, the imports of intermediate goods as a share of gross domestic product (GDP) have slowed for major exporters, especially in emerging markets such as China, India, and ASEAN. The share of intermediate goods imports, however, has been rising again in some countries and regions since the coronavirus disease (COVID-19) pandemic began, such as in India, ASEAN, and the EU (Figure 3).

Figure 3: Imports of Intermediate Goods
(% of GDP)



ASEAN = Association of Southeast Asian Nations, EU = European Union, GDP = gross domestic product, US = United States.
Source: UNCTAD (2024), Merchandise: Total Trade Growth Rates, Annual. https://unctadstat.unctad.org/datacentre/dataviewer/US.TradeMerchGR (accessed 4 July 2024).

India, Japan, and ASEAN GVC Integration Performance

While Japan and ASEAN are better integrated into the regional and global value chains, India has since been rising in terms of integration into the global value chain. The integration has been asymmetric, though. India's imports of intermediate goods to re-export (backward participation) have gone down, while its exports of intermediate goods for other countries to re-export have increased, including with ASEAN (Figures 4 and 5).

Figure 4: India's Backward Participation by Partner
(% of gross exports)

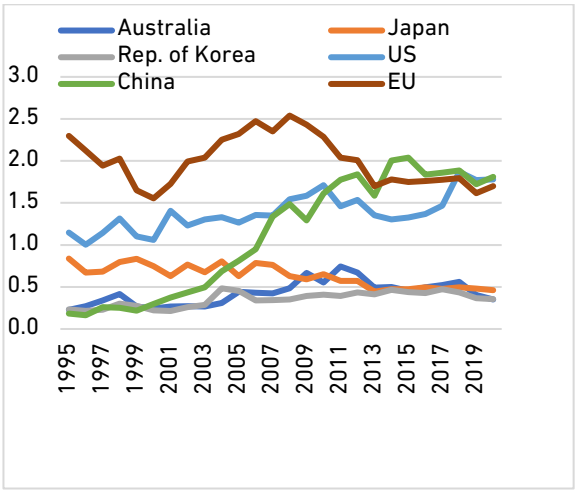
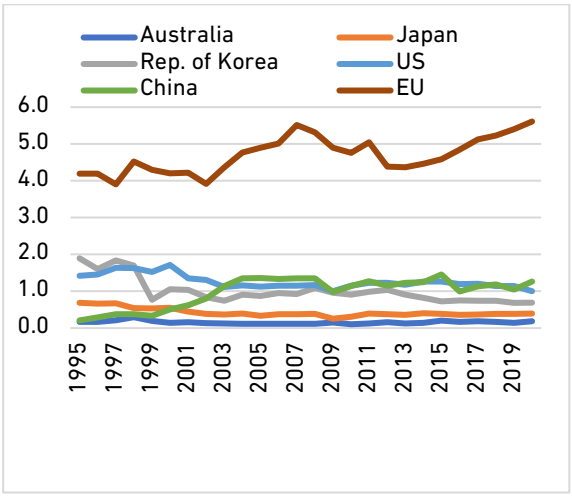


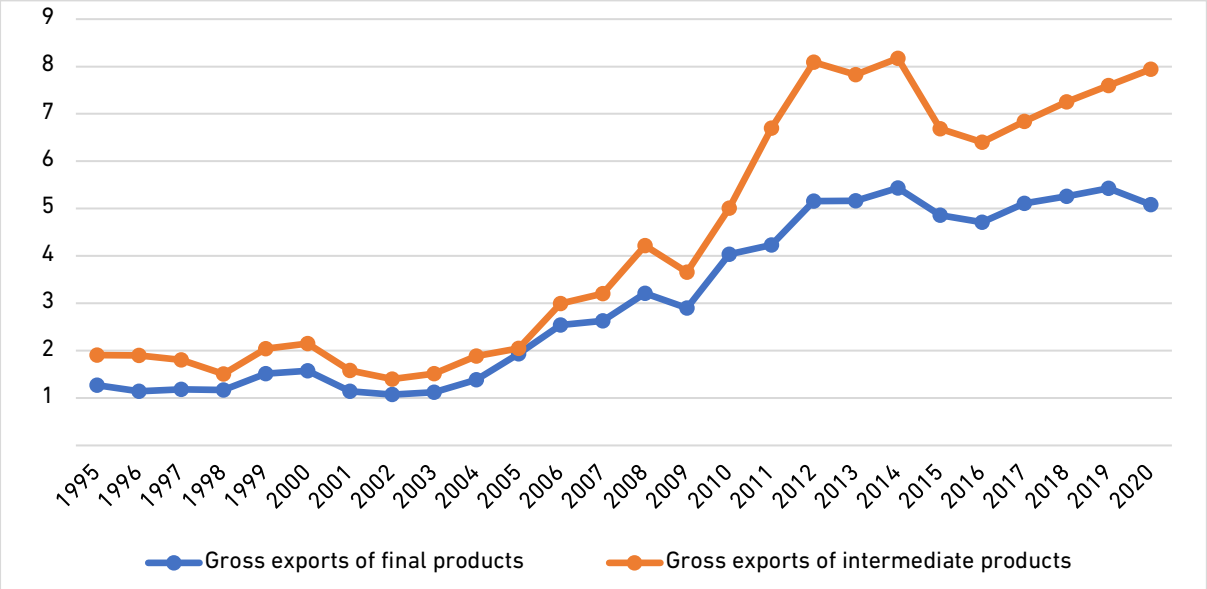
Figure 5: India's Forward Participation by Partner
(% of gross exports)



ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

India–Japan GVC integration trend is consistent with the above figures. India's exports to Japan are on the rise, both for gross exports of final goods and intermediate goods, which is also explained by India's growing forward participation by partners (Figure 6). India is also sending more intermediate goods to Japan for Japan's exports to third countries (as explained in Chapter 2).

Figure 6: India's Gross Exports to Japan, Final and Intermediate Goods, 1995–2020
(US$ billion)



Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

The value of Japanese exports of intermediate goods to India in 2020 was US$8.9 billion, only just ahead of India's exports of intermediate goods to Japan (US$7.9 billion) during the same year (Figure 6). Given India's ongoing efforts to grow its manufacturing sector, there is potential for increased investment in the manufacturing sector in India and to support India to grow its backward participation in GVCs – both with Japan and other manufacturing hubs in ASEAN.

Amongst the reported manufacturing industries, India's exports of final products to Japan are more varied than Japan's exports of final products to India. India sends finished petroleum, food, textiles, electronics, and machinery products. Japan's exports of final products to India are dominated by three industries – automobiles, electronics, and machinery – and to some degree chemicals.

During the same period, ASEAN has consolidated its position in the GVC, albeit with huge dependence on manufacturing in China. ASEAN integration with large, developed economies has declined since its peak in the late 2000s. ASEAN has become increasingly integrated with China, which has become the main individual partner in GVCs. Its integration with India has also grown during the same period, but the 'China centrality' in GVCs is remarkable. ASEAN's integration with the US and Japan has seen a steady negative trend since its peak in the late 2000s. In contrast, a partial recovery has taken place since 2015 with respect to the EU, which remains the main GVC partner for ASEAN amongst developed economies.

On a structural basis, the GVC integration of ASEAN with other economies is predominantly in backward participation, i.e. importing foreign products that are incorporated into ASEAN exports. The share of foreign value added in gross exports – or backward integration – accounts for almost two-thirds of ASEAN participation in GVCs, stressing its global upstream position as final exporter.

This contrasts with the declining share of domestic value added in foreign exports – or forward integration – in the US and Japan. The nature of bilateral integration has changed over time, positioning ASEAN more upstream with respect to the EU and downstream with respect to China, accounting for greater participation of Chinese inputs in ASEAN exports.

India–ASEAN GVC Integration is Crucial for Participating in Japan's Manufacturing Industries

ASEAN's manufacturing sector attracted the largest share of intra-ASEAN FDI, at around 33% of total FDI, followed by real estate and financial and insurance activities. On the other hand, top FDI flows from outside ASEAN (the US) primarily went to financial and insurance; professional, scientific, and technical; and manufacturing activities. FDI flows from the EU were similarly directed towards financial and insurance, wholesale and retail, and manufacturing activities. Chinese investors in ASEAN have also invested significantly in manufacturing, wholesale and retail, and real estate activities. These trends highlight

the diverse priorities and economic interests of investors from different regions, shaping the economic dynamics within ASEAN. Japan was the leading investor in the manufacturing industries in ASEAN in 2023, with 15,887 Japanese firms present in ASEAN, of which about two-thirds were manufacturing firms. As such, India's GVC integration with manufacturing firms in ASEAN is significant both for India–ASEAN trade and investment and India–Japan supply chain linkages.

From 2010 to 2020, India's GVC integration with ASEAN increased the most – by 1.3% of its gross exports – followed by 0.3% with China and the EU. Growing FDI between ASEAN and India should contribute to enhancing supply chain linkages between the two partners. The increased FDI should be reflected in manufacturing, rather than services, as is mostly the case now. In 2020, India ranked higher in GVCs than ASEAN, meaning that India exported more value added to the world. The rise of India–ASEAN GVC integration has been predominantly driven by forward integration with Singapore and to a lesser extent Viet Nam. Meanwhile, India's backward participation with ASEAN has dropped significantly since 2006, as India seeks to diversify its imports of raw materials.

FDI is the Key to Competitiveness

The growth of India's forward GVC participation in the manufacturing sectors remains sluggish due to the low FDI, however, compared with ASEAN.

The FDI received by India has been on the rise for many manufacturing sectors (e.g. the automobile, pharmaceutical, renewables, and electrical and electronics sectors), with most of it going to the digital sector. Comparatively, ASEAN received FDI of $9.5 billion for its electronics industry in 2022, which is in stark contrast to India's $539 million. Although India receives higher inflows in absolute value compared with individual AMS, together AMS outnumber India by more than two times. AMS have been receiving more FDI than India, especially from China, Japan, and Korea. India's FDI mainly comes from ASEAN, the EU, and increasingly the US. India's manufacturing value added outweighs services, but increasing the share will require transforming the demographic advantage in manufacturing through professional training, investments, and scaling up high-skill manufacturing. This could be achieved by increased policy negotiations on tariffs and non-tariff measures that slow down India's competitiveness and attractiveness as an investment destination.

India has been growing since the early 2000s and re-accelerated in recent years in exporting car parts (Harmonised System (HS) code 87), machinery (HS code 84), electrical and electronic parts and components (HS code 85), and transport equipment other than cars (HS code 88). It is important for India to gain traction in these products since they require higher production technology and thus carry higher value added compared with labour-intensive goods. During the rise of these industries in India, overseas demand from ASEAN helped significantly as India shipped as much as 25% of total orders for these

products to ASEAN. This remarkable growth in exports of goods from HS code 84 to 90 has seen an overall drop in exports to ASEAN since 2014. The growth in exports to Japan has increased marginally year on year. The scope for increased investment in production and supply chains therefore remain immense.

Meanwhile, ICT services remain India's most valuable sector in service exports, and its contribution of 7% of global value added in ICT is only lower than that of China (11%) amongst all emerging markets. Transportation and storage, wholesale and retail trading, and financial and professional services are also gaining traction thanks to the push of an uptick in FDI inflows. Therefore, increased attention to the services component of trade will be important for the review of India–Japan investments.

India–Japan–ASEAN Supply Chains for Green and Digital Trade

Green and digital trade is an emerging area of concern for all trading nations, as evidenced by the increasing inclusion of chapters and provisions dealing with these areas in free trade agreements, as well as their incorporation in work by the major multilateral agencies concerned with trade, e.g. through a concern with the links between trade and climate change, or the implications of digital transformation for trade and development.

Against this background, the role of green and digital trade in the India–Japan supply chains and investment is very important, making this partnership facilitate the supply chain linkages and increased trade in environmentally friendly products, as well as digital products. Producing green and digital goods and promoting critical mineral supply chains between India and Japan, and with other partners such as ASEAN and Australia, which are important upstream and downstream contributors, is the recommended strategy.

How does India–Japan bilateral trade feature green and digital goods, and the supply chain of components for manufacturing such goods? What sorts of policy changes could facilitate future growth in trade? These questions will need to be addressed if the India–Japan supply chain and investment plan is made fit for future trade.

Identifying Select Goods for the India–Japan–ASEAN–Australia Supply Chain

Green and digital goods are not a recognised part of any product or industry classification used in international settings, using existing HS code classification systems.

This supply chain could start by identifying low-carbon technology goods, whose development has been mainly led by high-income countries, but there is an urgent need for diffusion to low- and middle-income countries in the context of the Paris Agreement and the global commitment to achieve net zero carbon dioxide emissions by 2050.

The second cluster is environmental goods. This group refers to products that have significant potential to improve environmental conditions in a variety of ways.

The third cluster is the lithium-ion battery supply chain. The rationale for choosing this cluster is that lithium-ion batteries are crucial to many green applications, including EVs and renewable energy storage. This cluster is also important for the strategic partnership among India, Japan, ASEAN, and Australia in the larger context of cooperation for resilient and diversified GVCs in the Indo-Pacific region.

Amongst digital goods, there is benefit in focusing on emerging and new technologies, as well as goods that are important for supply chains. Semiconductors (HS 2017 codes 8541 and 8542) are important in emerging digital supply chains.

There are intensive inter-industry exchanges between India and ASEAN in the green and digital space, which is consistent with trade complementarities between the two, as evident from trade in semiconductors and lithium-ion batteries, which are important inputs into some environmental goods. Over time, ASEAN's exports are becoming more oriented towards semiconductors, and to some extent lithium-ion batteries.

India has major investment needs in renewable energy and is developing the capacity to be an important player in that sector in the region and potentially beyond. India, Japan, and ASEAN must initiate more collaboration in this area, which has important synergies with the development of regional manufacturing capacity in lithium-ion batteries, EVs, semiconductors, and other goods pertaining to the digital and green economy.

India is expected to continue its rise in the GVCs, with its promising demography and the global de-risking strategies regarding China. To make the most of these opportunities, India will need to relax its tariffs and non-tariff measures further (to assess if the domestic producers of intermediate goods can still compete with producers outside India) and push forward more trade and investment deals to attract more FDI inflows to improve its domestic manufacturing industries.

ASEAN's huge dependency on Chinese inputs in ASEAN's exports has supported the competitiveness of its exports. However, the current turnaround in trade policies in large developed markets like the US and the EU, which favour diversified and resilient supply chains, and the emergence of new production centres in India, South Asia, West Asia, and Africa, may be a new opportunity for ASEAN to diversify its trade linkages. This may be especially important in the emergent digital and green economy, where the technology and supply chains of environmental and digital goods will be closely monitored by ASEAN's important trading partners.

For India, given its low backward participation, both with ASEAN and the rest of the world, it reduces India's dependence on the rest of the world and increases self-reliance while promoting domestic companies. But it increases the costs of intermediated goods into domestic products (as it is mostly a consequence of high tariffs on imports and other trade-related barriers to imports). For a sustainable future of manufacturing in India and

for increased exports, import tariffs will need to be reduced to assess if the domestic producers of intermediate goods can still compete with producers outside India. This is the point where Japan's GVC integration with India will grow.

The key to deeper GVC integration and better quality of trade will lie in more bilateral FDI between India and Japan. Finding complementarities in manufacturing and the digital economy, including capacity enhancement, is the way forward for India and Japan to deepen their economic relations.

Economic Security and GVC Restructuring in Japan

Chapter 4 explains the GVC restructuring policies and incentives in Japan with the backdrop of resilient supply chains and how these will benefit Japanese investments in India.

GVCs were developed and expanded to take advantage of differences in factor endowments as labour-intensive production processes were relocated from advanced economies to developing economies endowed with abundant labour. The rationale that drove the process was mainly 'efficiency'. The situation has been changing since the trade conflicts between the US and China triggered by the first Trump administration. The tariff muddle in Trump 2.0 continues. To mitigate the negative impacts of these conflicts, private companies were effectively urged to reduce their dependence on China with support from their respective governments. This process, known as decoupling or de-risking, has been accelerated globally by rising geopolitical risks. Under such circumstances, GVC restructuring has been ongoing – driven by resiliency instead of efficiency.

In general, the deeper a country is integrated into GVCs, the more vulnerable it is to external shocks. While natural disasters or pandemics are contingent shocks, the recent rise in geopolitical risks is largely recognised as a structural shock for which we cannot expect a return to normal in a short period. Countries have therefore employed industrial policies to enhance resiliency instead of competitiveness by reducing dependency through reshoring, friend-shoring, developing new technologies, and so on. The semiconductor sector is a good example, where the wave of industrial policy was triggered by China's Integrated Circuit Industry Investment Fund, known as 'the Big Fund', in 2014 (followed by re-funding in 2019 and the third phase in May 2024) as its strategic effort to achieve self-sufficiency in semiconductor production and reduce reliance on foreign technology. The US enacted the CHIPS and Science Act in 2022 to bolster domestic manufacturing and research and development (R&D) in the semiconductor industry using subsidies and tax exemptions, and even restricting investment in countries of concern, i.e. China. The EU followed with the European Chips Act on 21 September 2023 to strengthen the semiconductor ecosystem in Europe through fiscal support and various incentive and facilitation measures.

A historically poor rice harvest in 1993 due to cold weather and the Great East Japan Earthquake in 2011 and supply chain disruptions urged Japanese firms to pay more attention to risks in their supply chain management by diversifying sources of inputs, markets, and trade routes. The Fukushima Daiichi Nuclear Power Plant incident drastically changed Japan's energy policy. The recent rise in geopolitical risks is regarded as a major external shock requiring Japan to embark on structural changes to review the balance between efficiency and risk in GVCs.

The 'Recommendations Toward Developing Japan's "Economic Security Strategy"', released on 16 December 2020, identified 16 priority issues including securing resources and energy, developing financial infrastructure, reinforcing cybersecurity, diversifying and strengthening supply chains, and achieving and maintaining Japan's technological excellence. The twin concepts of 'strategic autonomy', meaning that Japan should avoid excessive dependence on other countries and 'strategic indispensability', which urges Japan to strategically increase the number of sectors where Japan is indispensable to the international community underpin the Economic Security Strategy. The Economic Security Promotion Act (Act on the Promotion of Ensuring National Security Through Integrated Implementation of Economic Measures; Act No. 43 of 18 May 2022) entered into force on 1 August 2022. The Economic Security Promotion Office was established in the Cabinet Office with a Minister of State for Economic Security in the Cabinet.

The act ensures economic security through integrated implementation of economic measures – ensuring a stable supply of critical products, stable provision of essential infrastructure services, development of specified critical technologies, and non-disclosure of selected patent applications. A stable supply of 12 specified critical products, including fertilisers, magnets, machine tools, semiconductor elements, rechargeable batteries, and critical minerals, is regarded as the main objective of Japan's policy for GVC restructuring. Subsidies have been designed for approved business entities in the forms of direct grants or interest subsidies to financial institutions providing financing to the entities through the agencies in charge of supporting a stable supply of specified critical products.

The Ministry of Economy, Trade and Industry (METI) has also put in place Japan's strategy for semiconductors and the digital industry, including the digital infrastructure, reflecting the rapidly changing global trend, which requires enhanced efforts in the areas of economic security, digital transformation, green transformation, and generative artificial intelligence (AI). The Act on Promotion of Development, Supply and Introduction of Specified Advanced Information and Communication Technology Utilisation Systems (enforced on 1 March 2022) provides subsidies to business entities that plan to expand the domestic production capacity of advanced semiconductors.

Japan–India Economic Cooperation

Bilateral trade between Japan and India has been covered in the previous sections. The structure of Japan's exports to India in terms of HS 2-digit codes, the cumulative shares of the top 3, 5, and 10 items, and the Herfindahl-Hirschman Index (HHI) indicate that the export structure was stable until 2010 but has diversified since then. In terms of traded goods, the share of HS 84 (machinery and mechanical appliances) has been the largest since 2000. HS 85 (electrical machinery and equipment), HS 87 (transport machinery), HS 72 (iron and steel), and HS 74 (copper and articles thereof) have been highly ranked. HS 29 (organic chemicals), HS 28 (inorganic chemicals), HS 39 (plastics), HS 40 (rubber), and HS 90 (optical products) are also important export items to India.

Compared with exports, the structure of imports has shown more dynamic changes. HS 27 (mineral fuels) was highly ranked until 2020, but the share decreased rapidly to 2.0% in 2023 (ranked 12th). Imports of HS 29 (organic chemicals) increased from US$59 million (1.7%, 8th) in 2000 to US$970 million (17.2%, 1st) in 2023. HS 71 (precious metals), HS 72, and HS 62 (apparel) are consistently ranked relatively high.

Japan's FDI in India has been captured in the previous sections. Overall, ASEAN receives three times more Japanese FDI than India, but about half (47.2%) of Japan's FDI to India in 2023 is directed at the manufacturing sector, which includes Suzuki's acquisition of additional shares of its consolidated subsidiary, Maruti Suzuki India Limited. In January 2024, Maruti Suzuki announced the establishment of a new factory in Gujarat, and Suzuki is making investments in India to start the production of India's first battery EV in 2024.

Deepening the Bilateral Relationship

Japan and India have strengthened their bilateral relationship since the beginning of the 21st century. In addition, Prime Minister Shinzo Abe's epoch-making advocacy of the Free and Open Indo-Pacific in the keynote speech at the Sixth Tokyo International Conference on African Development (TICAD VI) in Kenya in August 2016, which asserted the importance of freedom of navigation, open trade routes, and respect for international law in the Indo-Pacific region, led to the restart of the Quad in November 2017. Besides their bilateral summit meetings and deepening bilateral ties, India and Japan have advocated economic security and prosperity in the Quad summit meetings. The next summit meeting will be held in New Delhi in 2025.

One of the visible deliverables of the Special Strategic and Global Partnership established in 2014 was the Japan–India Investment Partnership, under which both parties agreed to develop Japan Industrial Townships (JITs) as integrated industrial parks so that Japanese companies could smoothly establish production sites and operate their businesses – facilitating their investment in India and contributing to policies of India such as 'Make in India'. Since then, 12 JITs have been developed, and 110 Japanese companies are in

operations, construction, land contracts, or contract negotiations in 9 JITs, generating at least ₹150 billion in investment and about 35,000 jobs.

The rapid progress of digital technologies in India led to the establishment of the Japan–India Start-up Initiative during METI Minister Hiroshige Seko's visit to India in May 2018. The scope of bilateral cooperation was expanded in the Japan–India Digital Partnership agreed during Prime Minister Modi's visit to Japan in October 2018 to include collaboration between private firms, human resources in the IT sector, R&D in AI, and next-generation networks. Along this line of cooperation, the Japan–India Fund of Funds was established to mobilise financial resources for start-up businesses in India, aimed at enhancing collaboration amongst Indian companies, which are strong in software, and Japanese companies, which are strong in hardware.

In December 2019, the India–Japan Industrial Competitiveness Partnership (IJICP) was launched under an agreement between the METI Minister Hiroshi Kajiyama and the Minister of Commerce and Industry Piyush Goyal, as a secretary/vice minister-level framework. Under the IJICP, Japan and India have been working jointly to strengthen India's industrial competitiveness and promote bilateral industrial cooperation in areas such as logistics; sharing experiences and best practices on industrial policy; ease of doing business; export competitiveness; resolution of issues faced by Japanese companies operating in India; and issues in primary sectors such as healthcare, education, and agriculture through the use of digital technology.

Building upon existing bilateral cooperation frameworks, such as the Digital Partnership, CEPA, IJICP, and Clean Energy Partnership, the Initiative for Japan–India Industry Co-Creation aims to upgrade the bilateral economic relationship to the next stage by (i) creating future industries through innovation, (ii) evolving existing industries, and (iii) developing new markets. The memorandum of understanding on a Semiconductor Supply Chain Partnership signed by Minister Nishimura and the Minister for Electronics and Information Technology of India Ashwini Vaishnaw is an important part of the bilateral cooperation for the envisaged future industries, together with other cooperation in the areas of start-ups, digital technology, hydrogen and ammonia, and energy-related technologies. Cooperation on existing industries focuses on the steel industry in pursuit of economic growth and decarbonisation, the textile industry to improve quality, and small and medium-sized enterprises for capacity building and investment promotion. Initiatives for new market development include the promotion of Japanese export companies' investment in India, enhancing the export competitiveness of Indian industries, and the promotion of exports to third countries such as those in Africa.

The Supply Chain Resilience Initiative is a trilateral collaboration between Australia, India, and Japan to strengthen supply chains in the Indo-Pacific region by reducing the dependence on China. The initiative was launched in April 2021 in response to the COVID-19 pandemic, which exposed vulnerabilities in global supply chains and led to heavy debts for countries dependent on China.

Resilient GVCs and Critical Minerals Supply Chain: Australia is Important for India and Japan

The goals of the Supply Chain Resilience Initiative are to reduce China's dominance in the critical minerals supply chain and matching buyers and sellers for supply chain diversification.

Minerals like lithium, graphite, and nickel are widely expected to play an increasingly prominent role in global trade. Even under conservative projections, demand for these and other critical minerals will grow robustly, reflecting their importance for green technologies.

A second category of critical minerals constitutes those with applications in semiconductor manufacturing and are also used in solar photovoltaic (PV) technology, thus overlapping with the energy transition minerals. Silicon is a key example, with global trade in high-purity forms reaching US$6.0 billion in 2022. Others like gallium and germanium, which have more niche high-end and military applications, are traded in smaller volumes but feature on Indian, Japanese, and Australian government critical minerals lists.

Against the backdrop of market uncertainties and dependencies, domestic and international initiatives to safeguard critical minerals supplies have proliferated. Governments have employed a wide range of instruments, from regulatory policies to taxes and transfers to trade policies. In some cases, trade has been liberalised to facilitate critical minerals supply, such as India's recent exemption of 25 minerals from customs duties. In other cases, trade has been restricted, including through local content requirements and export curbs.

A critical role for India, Japan, and their regional partners is to resist imposing unilateral barriers and instead invest in institutions that keep markets for these minerals open. This will safeguard the security of supply and the diffusion of emissions-reducing technologies from becoming slower, costlier, and more volatile. Supply, demand, and the relative importance of critical minerals change over longer time horizons due to technological changes. An approach that encourages flexibility, preserves multilateral trade rules and norms, and uses industrial strategies judiciously will be most effective for securing supply into the short and medium term.

Improving the resilience of supply of critical minerals requires more transparent international markets. Since different countries have advantages in different parts of the value chain, there are international synergies. India, Japan, and regional partners have a wealth of forums available that, if used wisely, allow them to coordinate policies and strengthen supply chain resilience.

Production and Distribution of Critical Minerals

Competitive and contestable markets allow the distribution of supply to adapt more easily to changing conditions. Conversely, with high entry barriers, even geographically diversified production would take time to increase production. For example, China's restriction on rare earth exports to Japan in 2010 led to markets for raw rare earths becoming increasingly diverse while more reserves were found. Japan, like most Western countries, now sources a much smaller fraction of its supply from China compared with a decade ago.

For copper, the most ubiquitous critical mineral, the risk that global supply will fall short of energy transition demands is a greater concern than market concentration. Copper refining is more concentrated than mining – with China accounting for about 45% of refined output. India and Japan have footholds in the copper supply chain, where Japan is the third largest refiner by country of ownership and the fifth largest by location. India has substantial new refining capacity coming online, and the International Energy Agency (IEA) expects its global refined copper market share to grow from 2.1% in 2023 to 3.5% in 2035.

The geographical concentration of refining output should be understood in relation to downstream production and consumption. Products with highly concentrated production include refined magnet rare earth elements, gallium, and graphite, with China as the market leader. In 2023, China accounted for nearly 60% of new electric car registrations globally; the US represented only about 10%. Four of the world's top five wind power equipment manufacturers are in China, and in 2023, 97% of the turbines they installed were in their home market.

While spherical graphite is the most concentrated part of the EV supply chain today, its supply is nonetheless diversifying. India also has potential across the graphite value chain. It is a top five natural graphite producer, with 3.1% of global reserves, and Indian companies have produced spherical graphite in trials.

India has an estimated 6.3% of global rare earth element reserves, including neodymium and praseodymium, and Japan has rare expertise in producing rare earth magnets. There are two types of these magnets, bonded and sintered, with the latter used in EV motors and wind turbines. As of 2023, outside China, the only two plants that manufacture sintered magnets at scale are in Japan. There is great rare earth potential in Southeast Asia; Lynas established the world's first refining plant outside China in 2012 in Malaysia. The US Geological Survey estimated that Viet Nam has the world's second-largest rare earth reserves.

Minerals such as lithium face challenges with market responsiveness as the supply of lithium chemicals is relatively concentrated and, in the context of US–China strategic competition, exposed to geopolitical risk. There are plans for additional refining capacity in Australia, China, and Korea. The diversity of the future geographical distribution depends significantly on which battery technologies are adopted most widely. Lithium

reserves were discovered in India in 2023, which could present a significant new supply, though exploration is in its very early stages.

Geopolitical risks in the critical minerals sector will affect different markets in Asia and the Pacific in different ways. Markets for all EV inputs are likely to be significantly shaped by US policy, currently exemplified by the Inflation Reduction Act (IRA) of 2022. To qualify for US EV tax credits, a vehicle must have a minimum amount of its components sourced domestically or from free trade agreement partners. EVs cannot qualify for US subsidies if they contain any battery components manufactured or assembled by a 'foreign entity of concern', including China.

Some analysts expect that a two-tier lithium price will arise, with a premium for IRA-compliant sources. Similar dynamics may be emerging in graphite markets. However, regional price disparities also reflect non-policy factors like distance, and assigning causality to geopolitics to two-tier pricing is not straightforward.

Given the increasingly zero-sum nature of technological competition, the expansion of export controls is a risk to the short-term supply of any mineral concentrated in few countries. India, Japan, and regional partners' best defence against trade policy risks is to support institutions that aim to keep this trade open. Indonesia's ban on exports of nickel ores and concentrates (starting in 2009 but with uneven implementation until around 2020) has precipitated major changes in global markets. Nickel laterite mining and refining has overtaken the traditionally mined sulphide, driven by newer, more emissions-intensive laterite refining technology pioneered by Chinese firms in Indonesia

Over longer periods, export restrictions generate policy uncertainty that discourages investment in new capacity. Most significantly, trade barriers spark retaliation. While curbs on the export of intermediates may assist local downstream producers, these benefits are likely to be eroded if other countries follow suit.

No country, even China, would benefit from critical minerals autarky. If markets become segmented along geopolitical lines, prices will be higher and, on average, supply will be less responsive to shocks. International cooperation is critical to ensure governments can balance national security concerns with the broadly open markets that underpin that security.

An important factor in the ability of critical minerals supply to expand in response to shocks is accurate and timely pricing. Factors influencing price transparency include:

- the presence of markets at both spot and futures prices;
- whether trading is offered on major regulated exchanges; and
- the availability of data on costs, prices, capacities, and stockpiles.

Global price transparency should be explored by governments or industry bodies in producing countries through regulatory means. Key regional partners in this area are China, Australia, and Korea, as current and prospective lithium hydroxide producers, and Indonesia as a major nickel and cobalt supplier. Avenues for dialogue would include improving reporting on costs and quantities and exploring the use of physically settled contracts.

Prices for rare earths and graphite are even less transparent than lithium, as they are not typically traded on traditional commodity exchanges. Information on supply is scarce – governments generally do not publish data on germanium production or reserves, for example. Researchers at the Federation of American Scientists have proposed government-backed auctions and even support for new commodity exchanges as ways to improve transparency.

Recycling capacity, like price transparency, increases the responsiveness of critical minerals supply to shocks. Recycling has outsize benefits for supply chain resilience, growing an extra branch in a supply network that can be leant on when primary supplies run short.

Critical minerals recycling has been highlighted as an area for greater India–Japan cooperation. The India–Japan Clean Energy Partnership, signed in 2022, names recycling as a candidate for future collaboration. In August 2023, Japanese and ASEAN environmental ministers agreed to enhance cooperation on recycling, including on the development of e-waste disposal and collection regulations. Like copper refining, India also has potential to expand its role in global copper recycling.

India, Japan, and regional partners can gain from deeper critical minerals cooperation. They have several avenues for cooperation to enhance the resilience of critical mineral supply chains. Multiple forums and mechanisms have been established for collaboration on critical minerals and related issues such as the Australia–India Critical Minerals Investment Partnership, India–Japan Clean Energy Partnership, US–India Initiative on Critical and Emerging Technology, IPEF, and Australia-Japan-India Supply Chain Resilience Initiative (AJI-SCRI). In addition to these forums, there are non-governmental initiatives. The Quad Investors Network, for example, is a non-governmental project to foster private investment in strategic sectors, launched alongside the May 2023 Quad Leaders' Summit.

A productive agenda for India and Japan to boost critical minerals supply chain resilience could include the following.

- Engage with industry to identify favourable regulatory settings for market transparency.
- Continue to mobilise private investment and coordinate national policies through forums like the Quad.

- Encourage the free flow of skilled labour in midstream refining and processing.
- Support open trade in critical minerals and multilateral solutions to disputes.

India, Japan, and regional partners can build on successes like the Australia–India Economic Cooperation and Trade Agreement to reduce critical minerals trade barriers. Commercial diplomacy can play a productive role, especially where informational barriers and regulatory complexity are high. Above all, a functioning multilateral trade system is the ultimate defence against fragmented, uncertain trade in these critical products. Japan's decision in March 2023 to join the Multi-Party Interim Appeal Arbitration Arrangement was an important step forward in this regard.

In conclusion, India and Japan must now focus on leveraging their economic complementarities more strategically, transforming their trade relationship into a more balanced and forward-looking partnership. With continued collaboration in technology, innovation, and supply chain resilience, the two countries can redefine their bilateral trade trajectory in a way that it is mutually beneficial to both the partners and that takes along important partners like ASEAN and Australia by leveraging the respective cooperation frameworks amongst India, Japan, ASEAN, and Australia as the way forward to realise the potential for resilient supply chains in the region.

Chapter 1

Harnessing India–Japan Economic Partnership for Supply Chain Resilience in the Context of Global Trade Policy Uncertainties

Nagesh Kumar[1]

1. Context

The disruptions caused by lockdowns following the onset of the coronavirus disease (COVID-19) pandemic helped to highlight the heavy concentration of global supply chains of nearly all manufactured products in a single country. Recognising the pitfalls of such heavy dominance by one country led global companies to begin a process of diversification of their supply chains on a 'China Plus One' basis as part of de-risking strategies. The governments of leading industrial nations, including the United States (US), the European Union (EU), and Japan, also adopted industrial policies with budgets running into hundreds of billions of US dollars, combined with protectionism, to facilitate the restructuring of supply chains and make them resilient (Kumar 2024a, ISID 2025). The Trump 2.0 administration in the US is taking the process to new levels to try to reshore supply chains through very heavy protectionism in the form of reciprocal tariffs imposed on most exporters. Given their complementary economic structures and other endowments, their shared democratic values, and a close and deep strategic partnership, the India–Japan economic partnership has the potential to create alternative supply chains that would help to build a more equitable global order. However, despite deepening political engagement and institutional mechanisms, including the Comprehensive Economic Partnership Agreement (CEPA), the India–Japan economic partnership has failed to realise its well-recognised potential.

Against that backdrop, this paper reviews the opportunities and challenges the India–Japan economic partnership faces and recommends a policy agenda for harnessing its potential. It discusses the extent of concentration of global supply chains, the global trend of diversification, and the advantages of India in the rebuilding of supply chains. It summarises the steady deepening of the India–Japan strategic partnership, while noting

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that the bilateral economic partnership has yet to match the level of close political engagement. The paper concludes by outlining a way forward to realise this untapped potential.

2. High Concentration of Global Supply Chains in Traditional and Sunrise Industries

The global supply chains of traditional and sunrise industries have come to be dominated by China (Table 1.1). Amongst traditional industries, China has 53% of global crude steel capacity, 60% of aluminium, 44% of lead, 51% of cement, 50% of float glass, 40% of global chemical sales, 33% of plastics, 30% of thermal power equipment, 80% of room air conditioners, and 35% of automobiles capacity in the world. Amongst labour-intensive industries, China dominates toy manufacturing with a 70% share, and accounts for 38% of furniture, 55%–60% of footwear, 44% of textiles, and 32% of apparel production.

In green sunrise sectors, China's domination is even more complete, with over 80% of all stages of solar photovoltaic (PV) panel manufacturing, 76% of lithium-ion batteries, 60% of global wind turbine capacity, and 62% of global electric vehicle (EV) production. China also accounts for 75% of the global output of mobile phones, smartphones, and laptops.

Table 1.1: Concentration of Global Manufacturing Capacity in China, 2024

Sectors/ Products	Share (%)	Source
Wind turbines	>60	Windtech International (2025)
Solar Photovoltaic modules	>80	IEA (2022)
Lithium-ion batteries	76	Shanghai Metal Market (2025)
Electric Vehicles	62	Venditti (2025)
Mobile phones/smartphones	75	Zhou (2025)
Laptops	75	Gupta (2025)
Air conditioners	80	IBISWorld (2025a)
Display screens	72	Ezell (2024)
Integrated circuits	34	*The Hindu* (2025)
Steel (crude)	53	World Steel Association (2025: Table 3)
Aluminium	60	Statista (n.d.-a)
Cement	>51	Statista (n.d.-d)
Lead	44	*Mining Technology* (2024)
Thermal power equipment	30	IEA (2024)
Chemicals	>40	TradeImeX (2025)
Float Glass	>50	Statista (n.d.-b)
Plastics	33	Statista (n.d.-c)
Automobiles	35	ACEA (2025)

Sectors/ Products	Share (%)	Source
Textiles	44	*China Textile Leader* (2025)
Apparel	32	*China Textile Leader* (2025)
Footwear	55–60	IBISWorld (2025b)
Furniture	34–38	China International Furniture Fair (2025)
Toys	70	Cosmo Sourcing (2025)
Beverages	22	Statista (n.d.-e)
Tobacco products	38	IMARC Group (2024)
Tyres	41–52	IBISWorld (2024)
Wood and products	43	HORIZON Grand View Research (n.d.-c)
Household electrical equipment	27	HORIZON Grand View Research (n.d.-a)
Jewellery	24	HORIZON Grand View Research (n.d.-b)

Source: ISID compilation from the sources mentioned.

China holds a dominant position in the global critical minerals supply chain, processing over 85% of the world's rare earths, including about 60% of the world's germanium, 80% of global gallium production, 70% of lithium refining, and 78% of antimony. Gallium is used in semiconductors, germanium in both semiconductors and infrared technologies, and antimony in the production of everything from bullets to missiles, while lithium is critical for electric batteries.

The pandemic-linked lockdowns and the disruptions caused by them helped to focus attention on the vulnerabilities created by such a high dominance of global supply chains. Such dominance also raises strategic concerns and enhances the vulnerabilities that are often associated with high dependence. Instances of weaponisation of the domination of supply chains have already taken place, such as China's December 2024 ban on exports to the US of critical raw materials (Rockwell, 2025). The number of restrictions on the export of critical raw materials applied by governments grew more than fivefold from 2009 to 2020 to 13,102 (Kowalski and Legendre, 2023). In April 2025, China imposed export restrictions on seven rare earth elements (REEs) and related permanent magnets, requiring special export licenses and threatening to disrupt manufacturing in the automotive and electronics industries in India, Japan, and beyond. At the same time, excluded from the US market due to high tariffs, Chinese firms – faced with excess capacity and backed by deep financial reserves – have been dumping products in multiple markets, undermining domestic industries. Several Southeast Asian countries, including Thailand and Indonesia, have already witnessed the closure of thousands of factories due to this influx of cheap Chinese goods and have begun implementing measures to mitigate the damage. In India, such dumping is particularly severe in labour-intensive consumer goods – such as garments, imitation jewellery, non-leather footwear, toys, and furniture – posing serious challenges to local producers, especially MSMEs (ISID 2025).

3. Industrial Policy for Restructuring Supply Chains

Several leading industrialised countries including the US and the EU, are pursuing industrial policies to enhance supply chains resilience through onshoring/friend-shoring. In the US industrial policy has become the 'New Washington Consensus' (Kumar 2024a, ISID 2025). The Biden Administration laid out its industrial strategy through a series of landmark legislation, including the $280 billion CHIPS and Science Act, 2022; the $737 billion Inflation Reduction Act, 2022; and the $550 billion Infrastructure Investment and Jobs Act, 2021. These initiatives aim to bolster local manufacturing and innovation in critical areas such as semiconductor chips, electric mobility, and other advanced technologies by providing hundreds of billions of dollars in subsidies and tax incentives. In May 2024, these measures were reinforced by imposing steep tariffs of up to 100% on imports of steel, semiconductors, EVs, batteries, and solar PV modules from China. The US also restricted exports of next-generation semiconductor chips and related equipment to China. There is bipartisan consensus in the US on pursuing aggressive economic nationalism. This shift marks a significant departure from the Washington Consensus of the late 1980s, which emphasised globalisation, deregulation, and the virtues of free markets. The so-called New Washington Consensus prioritises strategic industrial policy. The Trump Administration 2.0 is taking this approach to new levels with the imposition of high reciprocal tariffs on virtually all countries announced on 2 April 2025, in addition to the 10% base tariffs, to rebuild domestic manufacturing capabilities, although it later paused them for 90 days.

The EU has followed up with its own industrial policy initiatives. On 1 February 2023, the EU unveiled the Green Deal Industrial Plan for the Net-Zero Age, aimed at strengthening the competitiveness of its industry while advancing its net zero objectives. This framework includes three key legislative proposals. The Net-Zero Industry Act, 2023 seeks to simplify regulations for producing key technologies, set capacity targets for 2030, streamline permitting processes, and encourage public authorities to procure clean technologies. The Critical Raw Materials Act, 2023 aims to secure a stable supply of raw materials essential for the net zero transition. Finally, reforms in electricity market design focus on enhancing market resilience, minimising the impact of gas prices on electricity bills, and supporting the energy transition. A major outcome of the EU's climate-focused industrial policy is the European Battery Alliance, a collaborative network promoting battery research and subsidised manufacturing across Europe. The EU is also working to expand its global share in semiconductor production and lead advancements in quantum computing. Additionally, the EU adopted a Carbon Border Adjustment Mechanism (CBAM) in December 2022, targeting imports of carbon-intensive goods such as cement, steel, aluminium, fertilisers, electricity, and hydrogen. Under this policy, EU importers must purchase CBAM certificates to account for carbon emissions associated with production. A transitional phase began in October 2023, with full implementation scheduled for 2026. Although the CBAM aims to support climate goals, it has been widely criticised as

unilateral, protectionist, and discriminatory – adopted to protect domestic industries. The EU has also followed the US in imposing additional tariffs on imports of EVs from China (Kumar 2024a, ISID 2025).

Japan launched the US$2 billion Supply Chain Diversification Programme in 2020 to help Japanese companies diversify and reduce their dependence on China by providing subsidies that incentivise companies to onshore or reshore their operations to friendly countries in the Association of Southeast Asian Nations (ASEAN). In the second phase, India and Bangladesh were added to the list of countries eligible for reshoring incentives. The Economic Security Promotion Act 2022 aims to enhance the resilience of supply chains. Under the Supply Chain Diversification Programme, incentives have been provided to several companies to reshore manufacturing projects – mainly in Viet Nam, but also in Indonesia, Malaysia and Thailand. Financial assistance was also provided to Toyota Tsisho and Sumida Corporation to diversify in India.

4. India Offers Win–Win Opportunities for Reshoring of Supply Chains by Japanese Companies

India offers several advantages, as outlined below, in terms of building alternative supply chains, which have helped to attract many large companies, including Apple, to make the country an important new manufacturing hub.

Large and fast-growing domestic market: India has sustained a rising trajectory of economic growth over the post-Independence period (Kumar 2022). The country emerged from the Covid-pandemic as the fastest-growing major economy in the world. The robust growth of around 6.5% over 2015-2025 decade helped the country become the fifth largest economy in the world from 9th in 2014. The country is projected to surpass Japan in 2025 to become the fourth largest economy, and Germany in 2028 to emerge as the third largest. With over 1.40 billion people, India is now the largest country in the world in terms of population. While per capita income levels are still low, the growing middle class has become a sizeable consumer of different manufactured goods and services, making India one of the largest global markets for several products, including motor vehicles, mobile phones, electronics, jet airliners, and a range of consumer goods. For example, annual imports of electronics are about $80 billion and growing rapidly, with projections rising to $400 billion by 2030. The large and growing domestic market can support several world-scale manufacturing plants for most industrial goods.

The demographic dividend: India also enjoys a demographic sweetspot, thanks to its relatively young population with a median age of 28 years. The share of the working-age population in India will peak at 68.9% around 2030 and will stay favourable until about 2056 (EY 2023). This contrasts with rapidly ageing populations in most industrialised

countries, such as Japan and European countries, as well as newly industrialised countries, such as the Republic of Korea (henceforth, Korea) and China. Hence, India is widely seen as the centre of the global workforce and skills of the future (Kumar 2023, ISID 2025). The demographic profile suggests that India could supply not only unskilled and semi-skilled workers for assembling and other manufacturing jobs but also workers trained in artificial intelligence (AI), machine learning, and data science who will be in huge demand as the Fourth Industrial Revolution (Industry 4.0) takes hold (Kumar 2023).

The geopolitical advantage: The ongoing industrial restructuring of global supply chains is designed to reduce their heavy dependence on one source – China – making the China Plus One strategy integral to their de-risking strategies. This has a geopolitical dimension as it involves either diversification to other friendlier countries (friend-shoring) or reshoring back to their home country, as automation reduces the importance of cheap labour arbitrage. India enjoys a geopolitical sweetspot in attracting this supply chain restructuring, given its friendly relations with major industrialised countries in both the West and the East, including free trade agreements or comprehensive economic partnership agreements (CEPAs) with Japan, Korea, Australia, ASEAN, the United Arab Emirates, the European Free Trade Association (EFTA) countries, the just concluded with the United Kingdom, amongst others, as well as ongoing negotiations with the EU and US. The emergence of India as the second-largest player in mobile phone assembly, with Apple and Samsung locating their assembly lines in the country, reflects the potential of positioning itself as an alternative supply chain destination.

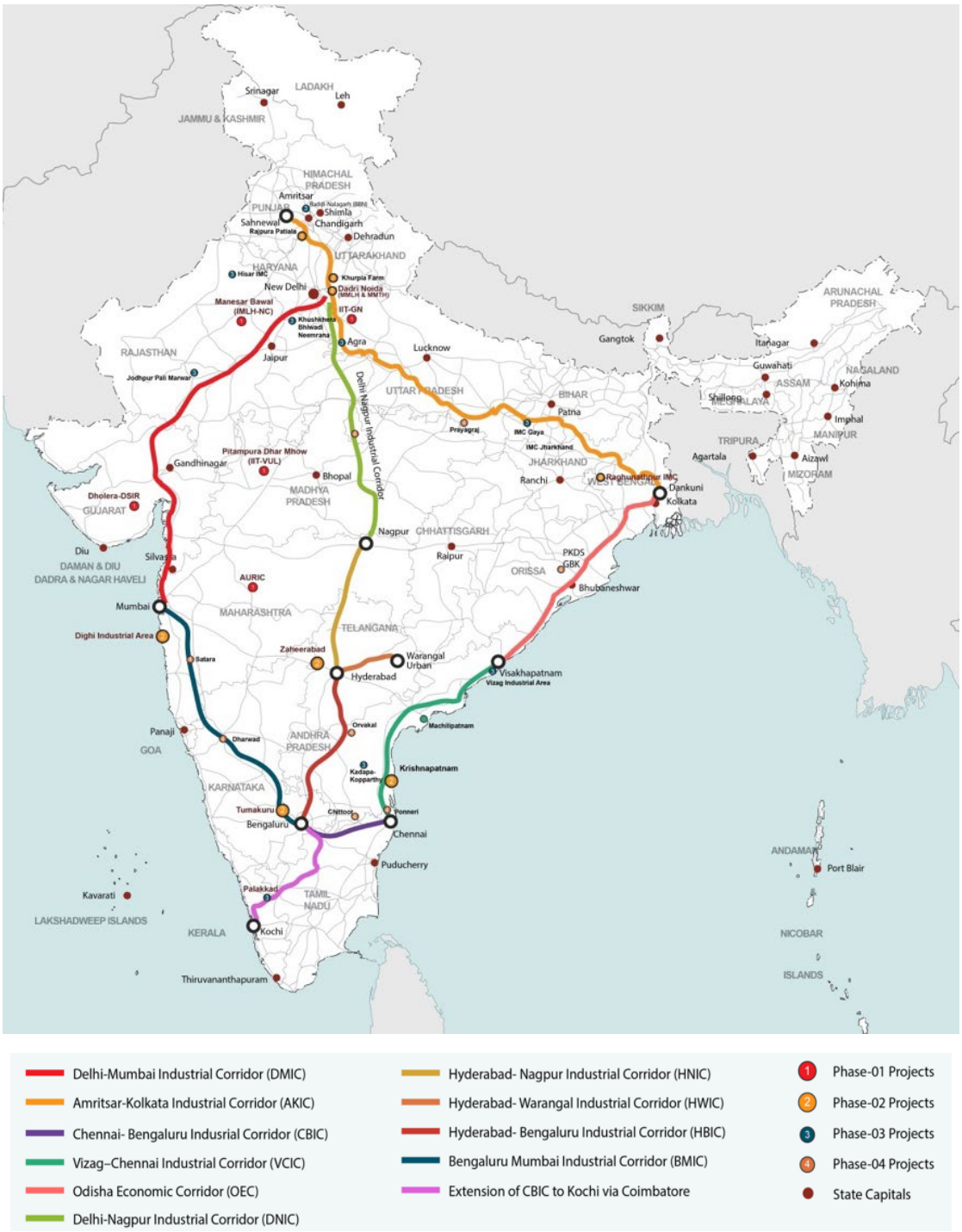
Growing technological prowess and ICT capability: India has been moving up the Global Innovation Index, the World Intellectual Property Organization's comprehensive index of innovation, based on indicators of institutions, human capital and research, infrastructure, market and business sophistication, knowledge and technology outputs, and creative outputs. In 2024, India ranked 39th among 133 countries, marking a significant improvement from 81st a decade earlier. This jump of 42 places outperformed expectations corresponding to its status as a lower middle-income country and put India ahead of countries with much higher per capita incomes, such as Thailand, Viet Nam, Brazil, Indonesia, and South Africa.[2] India performs particularly well in knowledge and technology outputs, ranked 22nd globally. Information and communication technology (ICT) software and chip design capabilities could propel India to prominence in Industry 4.0. India's globally acknowledged software development and chip design capability are significant advantages in terms of manufacturing, which has attracted Fortune 500 companies to establish 1,700 Global Capability Centres in India to leverage these skills. As India seeks to build an ecosystem for electronics and semiconductors, these capabilities would lend it an edge. Furthermore, India's large and fast-growing market offers opportunities to build world-scale plants to tap scale economies.

[2] See ISID (2025) for more detailed analysis.

Start-up ecosystem fostering technology-driven entrepreneurship: With nearly 160,000 start-ups recognised by the government as of 15 January 2025, India has firmly established itself as the third-largest start-up ecosystem in the world. This vibrant ecosystem, driven by over 100 unicorns, continues to redefine innovation and entrepreneurship on the global stage. Major hubs like Bengaluru, Hyderabad, Mumbai, and Delhi National Capital Region have led this transformation, while smaller cities have increasingly contributed to the nation's entrepreneurial momentum. Start-ups in fintech, edtech, health tech, and e-commerce have tackled local challenges and gained global recognition. Companies like Zomato, Nykaa, and Ola showcase India's shift from job seeker to job creator, driving economic progress (ISID 2025).

Improving logistics infrastructure and industrial corridors: Efficient logistics and industrial infrastructure are critical for manufacturing competitiveness. To address infrastructure constraints and provide efficient logistics support for industrialisation, the government is implementing the National Industrial Corridor Development Programme. This programme includes a Multi-Modal Transport Network encompassing railways, highways, expressways, waterways, airports, and ports; logistics/trans-shipment hubs; industrial cities/townships; and urban infrastructure, sometimes referred to as freight, industrial, railways, and expressways (FIRE corridors). Eleven industrial corridors are under development across the country (Figure 1.1). Five of these corridors were approved between 2007 and 2014, and the remaining six received approval between 2019 and 2020. The first corridor, the Delhi–Mumbai Industrial Corridor, is the most advanced in terms of implementation. Overall, 32 projects across these 11 corridors are planned to be completed in four phases, focusing on manufacturing zones, logistics, and transport hubs. As these industrial corridors pass through some of India's less industrialised states, they are expected to promote more balanced regional development (ISID 2025).

Figure 1.1: India's Industrial Corridors



Source: https://www.nicdc.in/resources/corporate-brochure

Strengthening the logistics infrastructure: Recognising the importance of logistics infrastructure in developing the manufacturing sector, the Government of India has launched several initiatives aimed at improvement, including high-speed dedicated freight corridors connecting Delhi, Mumbai, Chennai, and Howrah as part of the Indian Railways Network, enhancing logistics efficiency. Multi-Modal Logistics Parks

strategically located at 35 important sites offer access to road, rail, and air transportation. The PM Gati Shakti National Master Plan, launched in October 2021, is a $1.2 trillion plan to improve logistics efficiency and reduce costs by coordinating infrastructure planning across agencies and breaking down interdepartmental barriers. The National Logistics Policy, adopted in 2022, complements the Gati Shakti initiative by focusing on swift last-mile delivery and resolving transport-related challenges to reduce costs and improve efficiency in the logistics sector. India is deploying new technologies like radio frequency identification (RFID) tags to enable end-to-end tracking of the supply chain, reducing delays. The introduction of the e-waybill system, which mandates electronic documentation for truckloads valued above ₹50,000, reduces the need for physical paperwork and state boundary checks, enhancing logistics efficiency and expediting supply chains. India has also made substantial progress in trade facilitation through digitalisation. A major contributor to this improvement is the Indian Customs Electronic Data Interchange Gateway (ICEGATE), the national portal for e-filing services that connects trade users with the Customs Department and facilitates information exchange with international trading partners. India's enhancements in logistics infrastructure are reflected in its improved rank on the World Bank's Logistics Performance Index, moving from 54th in 2014 to 38th in 2023.[3]

Cross-border economic corridors and hub for Asia–Europe trade: India is building cross-border economic corridors on both its eastern and western borders as strategic initiatives to enhance trade. These include the International North–South Transport Corridor, which will provide India with direct access to Central Asia via Chabahar port in Iran. India has signed a 10-year contract to develop and operate Chabahar. The India–Middle East–Europe Economic Corridor (IMEC) is another important initiative in cross-border connectivity. The IMEC will comprise two segments: the East Corridor, connecting India to the Gulf, and the Northern Corridor, linking the Gulf to Europe. On the eastern side, India has been working on the India–Myanmar–Thailand (IMT) Highway, a 1,360-kilometre route that will connect Moreh in Manipur with Mae Sot in Thailand. With emerging international transport corridors on both its eastern and western sides, India is well-positioned to become a hub for Asia–Europe trade.[4]

Revamped SEZ Programme: A Special Economic Zone (SEZ) is a designated geographic area with distinct economic regulations. The SEZ Act, 2005 became effective in February 2006, following the establishment and notification of SEZ rules. These zones offer numerous benefits, including (i) tax incentives, (ii) access to standard factories/plots at low rents with extended lease periods, (iii) infrastructure and utilities provision, (iv) single window clearance, (v) simplified procedures, and (vi) exemptions from various investment restrictions found in the domestic economy. India has 262 operational SEZs hosting 5,537

[3] See ISID (2025) for more detailed analysis.
[4] See ISID (2025) for more detailed analysis.

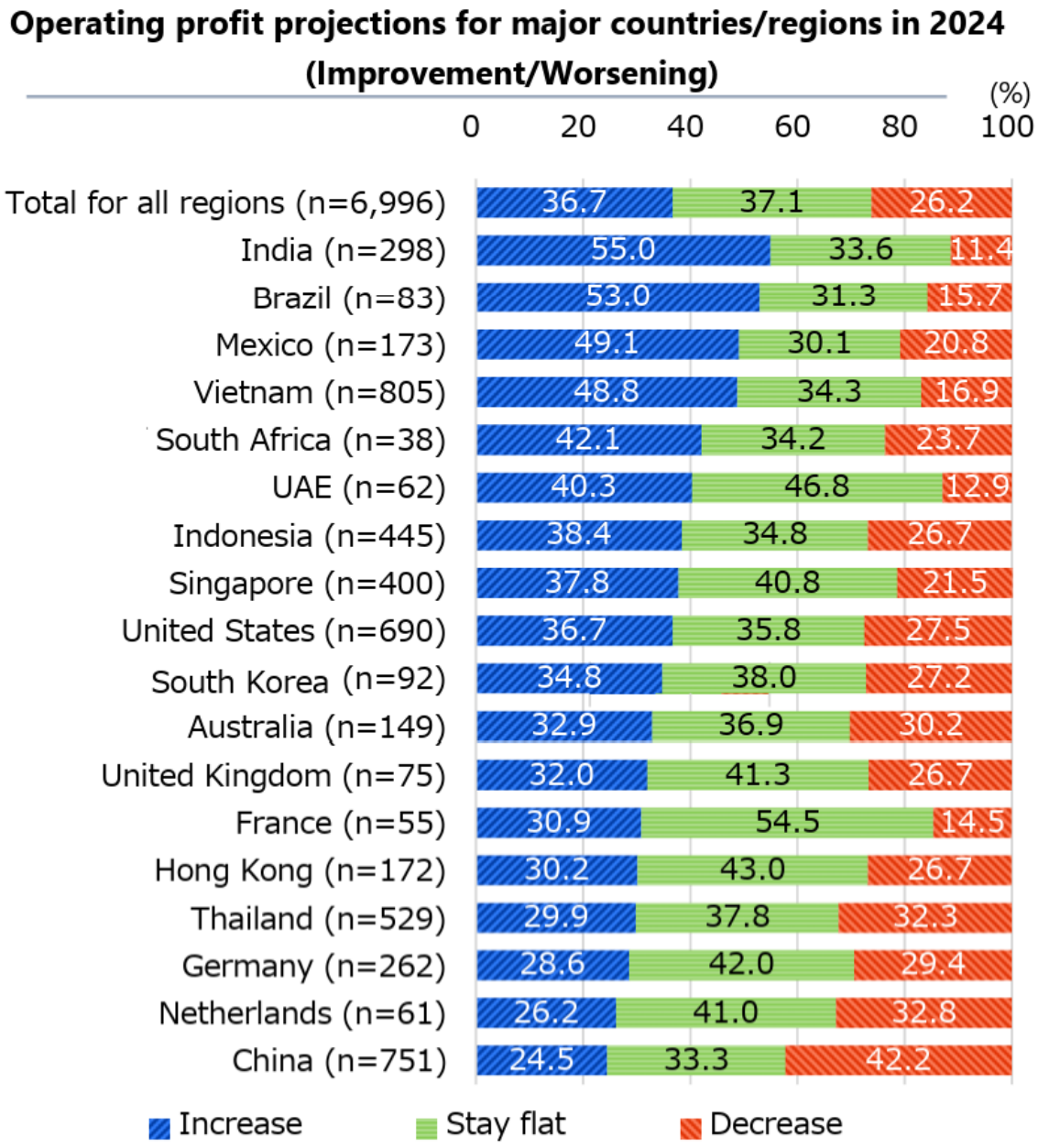
approved units. Future SEZs are expected to align with the dedicated freight corridors (ISID 2025).

Industrial policy and reforms to foster the manufacturing sector: The Make in India programme, adopted in 2014, has brought the focus back on building manufacturing capacities. The major reforms include the Insolvency and Bankruptcy Code, 2016, which provided a consolidated framework governing insolvency and bankruptcy proceedings for companies and the Goods and Services Tax (GST), introduced in 2017, which made India a single market. Apart from these big reforms, the government has focused on improving the ease of doing business through the abolition of thousands of obsolete regulations and processes that hinder industrial investment. Foreign direct investment (FDI) ownership caps in several sectors (e.g. railways, defence manufacturing, insurance, and medical devices) were increased, and an investment promotion and facilitation agency, Invest India, was established. Corporate tax rates were also reduced in FY2019/20 from 35% to just 22% and 15% for new companies. Indian companies now pay a lower statutory tax rate than companies in other emerging economies such as Argentina, Brazil, and Mexico. As a result of these steps, India's ranking on the World Bank's Ease of Doing Business index jumped from 142 in 2014 to 63 in 2019 (before the World Bank abandoned the rankings in 2021). Make in India has been reinforced and boosted by the Production-Linked Incentive (PLI) scheme and sectoral missions. Introduced in 2020 as part of the Self-Reliant India (*Aatmanirbhar Bharat Abhiyan*) package, the PLI provides a 4%–6% incentive to boost local production (or substitute imports) and exports for 14 select sectors. These include sunrise and green manufacturing products such as solar PV cells and modules, advanced chemistry batteries, active pharmaceutical ingredients, large-scale electronics, medical devices, speciality steels, and telecom and networking equipment. The PLI was extended to two additional sectors – toys and footwear – in 2024–25. To create a full ecosystem for electronics, the government launched the $10 billion India Semiconductor Mission in 2022 to promote the manufacture of semiconductor chips and displays. In the same year, the government announced the $2.3 billion National Green Hydrogen Mission to make India a leading manufacturer and exporter of green hydrogen (Kumar 2024b).

India's emergence as the most attractive FDI destination backed by JETRO surveys: The 2024 Japan External Trade Organization (JETRO) Business Conditions Survey highlighted an outstanding improvement in India's performance, with 80% of Japanese firms expecting to expand operations in India compared with 45% for all regions and only 22% for China (Figure 1.2) (JETRO, 2024). In India, the share of Japanese companies seeking 'expansion' increased for the fourth consecutive year and exceeded 80% for the first time in 12 years – the highest amongst all the regions and countries. In India, 'expansion of local market needs' was the most cited reason. Furthermore, the survey reported that 55% of Japanese companies in India had a rising profit projection, compared with only 24.5% in China (JETRO, 2024). The survey also reported that in India, competition

intensified due to European and United States companies aggressively conducting M&As and forming alliances with local firms (JETRO, 2024).

Figure 1.2: Business Plans of Japanese Companies in India and Major Host Countries, 2024



UAE = United Arab Emirates.
Source: JETRO (2024).

5. Steady Evolution of India–Japan Partnership

India and Japan have had cultural exchanges since the sixth century, when Buddhism was introduced to Japan. In modern times, India and Japan established diplomatic relations in 1952 and signed a peace treaty. The first yen loan was extended to India in 1958 following the visit to India, of Japanese Prime Minister Nobusuke Kishi. Prime Minister Atal Bihari Vajpayee and Prime Minister Yoshiro Mori established the Global Partnership between the two countries during the Japanese premier's visit to India in 2000. Since 2005, India and Japan have had annual summits. In 2006, during the visit to Japan of Prime Minister Manmohan Singh, the bilateral relationship was elevated to a Global and Strategic Partnership. They also established a Joint Study Group to explore the feasibility of a CEPA. After 14 rounds of trade negotiations following the recommendation of the Joint Study Group, the India–Japan CEPA was signed in 2011 and has been in force since then. In 2014, during the visit of Prime Minister Narendra Modi to Japan, the two countries agreed to upgrade their relationship to a Special Strategic and Global Partnership. In 2015, during Prime Minister Shinzo Abe's visit to New Delhi, the two prime ministers resolved to transform the India–Japan Special Strategic and Global Partnership into a deep, broad-based, and action-oriented partnership, reflecting the broad convergence of their long-term political, economic, and strategic goals. They announced the 'Japan and India Vision 2025 Special Strategic and Global Partnership: Working Together for Peace and Prosperity of the Indo-Pacific Region and the World', a joint statement to guide the 'new era in Japan–India relations'.[5]

In 2022, during the visit of Prime Minister Fumio Kishida to India, the two countries adopted a joint statement on a 'Partnership for a Peaceful, Stable and Prosperous Post-COVID World'. They also expressed the intention to realize ¥5 trillion of public and private investment and financing from Japan to India in the next 5 years, recalled the establishment of the India–Japan Industrial Competitiveness Partnership (IJICP) in November 2021, and welcomed the formulation of a roadmap for the IJICP and the launch of the India–Japan Clean Energy Partnership.

Besides bilateral engagement at the leaders' level, India and Japan have evolved multiple forums of engagement, including bilateral comprehensive and sectoral ministerial meetings such as the 2+2 Ministerial Dialogues (with ministers of foreign affairs and defence from both countries). In addition, they set up the India–Japan Act East Forum.

India and Japan are also members of the Quadrilateral Security Dialogue (Quad), which comprises four countries: Australia, India, Japan, and the US. The Quad's primary goal is to foster a free, open, and prosperous Indo-Pacific region by collaborating on issues like security, trade, and disaster relief.

[5]See https://www.mofa.go.jp/s_sa/sw/in/page3e_000432.html

The Asia–Africa Growth Corridor (AAGC) is a partnership between India and Japan aimed at fostering economic development and connectivity between Asia and Africa. It focuses on four key pillars: development and cooperation projects, quality infrastructure and institutional connectivity, capacity and skill enhancement, and people-to-people partnerships. The AAGC aims to improve economic growth, expand trade, and transform the region into a growth corridor.

The Indo-Pacific Economic Framework for Prosperity (IPEF) is an economic initiative launched by the US in May 2022. It aims to strengthen economic cooperation and integration within the Indo-Pacific region, focusing on four pillars: trade, supply chains, a clean economy, and a fair economy. The IPEF has 14 founding member nations including India and Japan. Both countries are also members of the IPEF Supply Chain Agreement, which came into force in February 2024. India and Japan are also members of the Group of Twenty (G20), the premier global forum for dialogue on economic issues.

The India–Japan CEPA is one of the most comprehensive such agreements signed by India, covering trade in goods, services, movement of natural persons, intellectual property, government procurement, competition, business environment, and cooperation. It has been in force since 2011 and targeted the abolition of tariffs on 94% of items over 10 years.

6. Strategic Engagement and India–Japan Economic Partnership

India and Japan have steadily deepened their engagement at the leaders' level given their shared concerns about the need to keep the supply chains in the Indo-Pacific region open and secure. The deepening political and strategic engagement in bilateral, regional, and multilateral forums, however, has not resulted in a deepening of economic partnership.

India–Japan trade

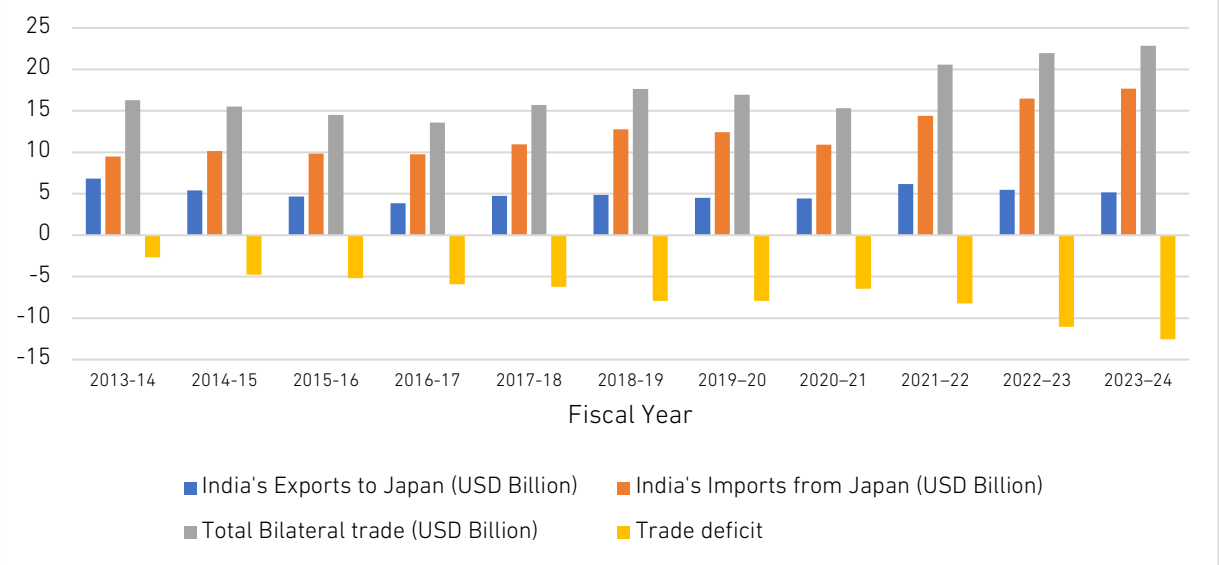
India's bilateral trade expanded from US$15 billion–US$16 billion per year a decade ago (in 2013–2014) to around US$22 billion in 2023–2024 (Table 1.2). However, the growth largely represents rising imports to India from Japan, up from around US$9 billion–US$10 billion around 2013–2014 to around US$17 billion in 2023–2024. India's exports to Japan have fallen in absolute terms from around US$6 billion per year in 2013–2014 to US$5 billion a decade later. As imports have grown while exports have declined in absolute terms, the trade deficit widened from US$2.67 billion in 2013–2014 to US$12.54 billion in 2023–2024 (Figure 1.3).

Table 1.2: Trends in India's Bilateral Trade with Japan, 2014–2024

Fiscal Year	India's exports to Japan (US$ billion)	India's imports from Japan (US$ billion)	Total bilateral trade (US$ billion)	Trade deficit (US$ billion)
2013–14	6.81	9.48	16.29	-2.67
2014–15	5.38	10.13	15.51	-4.75
2015–16	4.66	9.85	14.51	-5.19
2016–17	3.85	9.75	13.60	-5.90
2017–18	4.73	10.97	15.71	-6.24
2018–19	4.86	12.77	17.63	-7.91
2019–20	4.52	12.43	16.95	-7.91
2020–21	4.43	10.90	15.33	-6.47
2021–22	6.18	14.39	20.57	-8.21
2022–23	5.46	16.49	21.96	-11.03
2023–24	5.15	17.69	22.85	-12.54

Source: Institute for Studies in Industrial Development (ISID) compiled from the Ministry of Commerce and Industry Database (https://tradestat.commerce.gov.in/)

Figure 1.3: India–Japan Bilateral Trade 2014–24



Source: Author based on Table 1.2 above.

India's primary exports to Japan are petroleum products; organic chemicals; fish and crustaceans, molluscs, and other aquatic invertebrates; nuclear reactors, boilers, machinery and mechanical appliances, parts thereof; vehicles other than railway or tramway rolling stock, and parts and accessories thereof; etc. India's primary imports from Japan are machinery, electrical machinery, iron and steel products, plastic materials, non-ferrous metals, parts of motor vehicles (Ministry of External Affairs, 2023).

Japan's share in India's total imports of electronic products as well as automobiles has fallen, while the share of China, ASEAN, and Korea has risen.

A detailed analysis of the India–Japan CEPA by Seshadri (2023) found that India's exports to Japan initially rose in the first few years after the agreement, with Japan's share in India's exports increasing from 2.04% to 2.17%. However, this share gradually declined to just 1.2% by 2022, while Japan maintained a stable share of around 2.3% in India's imports. Indian products that gained from the CEPA include fish items such as shrimps and fish meat, organic chemicals, ferro alloys, dyes and pigments, woven garments, and castor oil. Yet, the CEPA failed to boost exports of garments, footwear, and leather products. Moreover, Japanese regulatory standards prevented Indian exporters from fully utilising CEPA preferences in pharmaceuticals, vegetables, fruits, sesame seeds, and fish products. Article 13 of the CEPA on Economic Cooperation was also underutilised, missing an opportunity to enhance product quality and help Indian exporters meet Japan's stringent market specifications and standards (Seshadri, 2023).

In other words, the potential for mutually beneficial trade between India and Japan, especially for India's exports, remains untapped despite a functional India–Japan CEPA. There is an urgent need for diversification of the products that India exports, especially labour-intensive products such as textiles and garments, leather goods and footwear, processed foods, gems and jewellery, furniture, and toys, amongst others, which Japan imports in very large quantities from China but minimally from India. Japan imports apparel worth around US$30 billion per year, nearly 60% of which is imported from China, 15% from Viet Nam, 5% from Bangladesh, and 5% from Cambodia. India's share is less than 1% of Japan's apparel imports.[6] Supply chain diversification should focus on these labour-intensive sectors, among others, where India has a comparative advantage.

In sum, the reshoring of supply chains by Japanese companies to India has yet to gain momentum – despite the growing strength of the bilateral partnership, a functional CEPA, India's large and expanding market and skilled workforce, improving infrastructure and business climate, government incentives on both sides, and favourable JETRO survey findings.

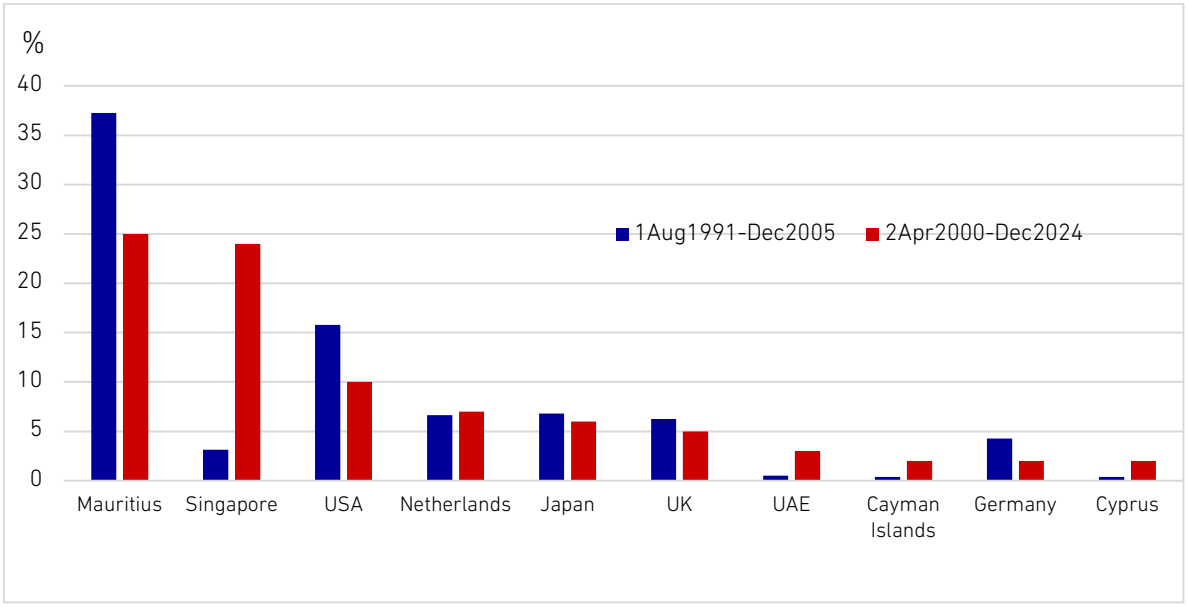
Japanese FDI inflows

FDI inflows are key to supply chain restructuring. Japan has been an important source of FDI inflows globally and to India. Japan has been the fifth-largest source of FDI to India (Figure 1.4). Japanese FDI between 2000 and 2024 totalled $43 billion (Ministry of Commerce and Industry, 2025). Japan's share in the total FDI of US$667 billion received during the period is 6.4%. Figure 1.5 shows that FDI inflows from Japan have fluctuated

[6] https://www.cheersagar.com/blog-detail/japans-apparel-imports-the-indian-prospect

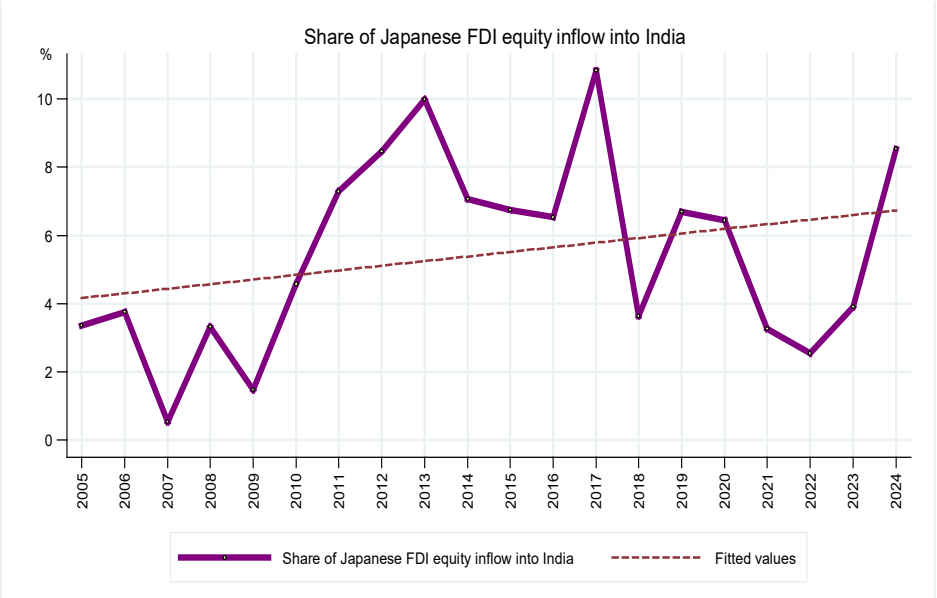
along a rising trajectory. Although the share in FDI, at 6%, is better than Japan's share in India's trade, it is still below its potential as a major source of FDI globally.

Figure 1.4: Top Sources of FDI to India, 1991-2024



UAE = United Arab Emirates, UK = United Kingdom, US = United States.
Source: Institute for Studies in Industrial Development (ISID) based on Indian Department for Promotion of Industry and Internal Trade (various years), FDI Statistics. https://dpiit.gov.in/publications/fdi-statistics (accessed 24 April 2025).

Figure 1.5: Trends in Share of Japan in FDI Inflows received by India, 2005–2024



FDI = foreign direct investment.
Source: Institute for Studies in Industrial Development (ISID) based on Indian Department for Promotion of Industry and Internal Trade (various years), FDI Statistics. https://dpiit.gov.in/publications/fdi-statistics (accessed on 24 April 2025).

Despite the relatively subdued performance in terms of the magnitude of Japanese FDI inflow, several Japanese companies have made India an important part of their global value chains. For instance, Suzuki Motor Corporation's Indian subsidiary, Maruti-Suzuki India Limited, is a crucial part of the company's global operations, serving as a major production and export hub, especially for passenger vehicles. After Japan, India is Suzuki's second-largest market, with cumulative production exceeding 30 million vehicles. Maruti-Suzuki is also the largest passenger vehicle exporter in India, contributing significantly to global exports. In 2024, the company achieved an all-time high export volume of four-wheel vehicles, at 326,000 units – an increase of 121% over the previous year. India is becoming increasingly important, not just as a production hub but also as a centre for global exports, including to Europe, Japan, and South America (Sachdev, 2025). Suzuki is increasing its production capacity in India to double down on a market that contributes more than 60% to its global production. In FY2023, Maruti Suzuki accounted for 41% of Suzuki's global revenue and 45% of its profitability (CNBCTV 18, 2023).

Similarly, Toyota's India operations, primarily through Toyota Kirloskar Motors, are a vital part of its global strategy, playing a significant role in both the Indian market and as a manufacturing hub for global exports. India is a high-priority market for Toyota and is now integrated into the Middle East, East Asia, and Oceania region, acting as a regional hub. Toyota Kirloskar Motor, with plants in Karnataka and Tamil Nadu producing vehicles and components, has been expanding in India, aligning its operations with national priorities like skill enhancement, localisation, and ecosystem development. Toyota has a Global Business Services Centre in Bengaluru, a significant hub for Toyota's global research and development. Toyota Kirloskar Auto Parts supplies transmissions for global requirements. Toyota India has a strong export focus, with cumulative export contributions exceeding INR320 billion, indicating its role as a global supplier (Toyota, 2023).

Daikin India is a wholly owned subsidiary of Daikin Industries Ltd., a global leader in air conditioning and refrigeration. It plays a crucial role in Daikin's global operations, particularly in the Indian market, which Daikin sees as one of its fastest-growing markets. Daikin India focuses on the manufacturing, sales, and service of air conditioning systems, and has a dedicated research and development centre for developing products tailored to the Indian climate. Daikin India envisions itself as a key component of Daikin's global organisation, with a focus on innovation, people, processes, manufacturing, products, and technology. Daikin has a long-term investment strategy in India and plans to expand its manufacturing base to make it a hub for the Middle East and Africa markets (Daikin India, 2016; *The Economic Times*, 2023).

7. The Way Forward for Leveraging India–Japan Economic Partnership for Supply Chain Restructuring

To sum up the above discussion, the very high domination of global supply chains for a vast range of traditional and sunrise industries by one country presents important strategic threats and vulnerabilities. Leading industrialised countries are seeking to restructure their supply chains, including through industrial policy. With its large and fast-growing market, abundant skills base, fast-improving industrial and logistics infrastructure, supportive government policy including through the Make-in-India and PLI schemes, and vibrant relations in the West as well as the East, India is rapidly emerging as a favourite destination for reshoring of supply chains by global companies, as demonstrated by its emergence as the second largest base for the assembly and export of mobile phones in recent years.

India could also be an important base for the supply chain reshoring of Japanese companies, given the deepening strategic engagement of the two governments, their shared democratic values, and complementary demographics, specialisation, and resources. Successive political leaderships of the two countries have progressively deepened their engagement and created a supportive institutional framework for deepening economic partnership, including the comprehensive India–Japan CEPA signed in 2011.

Yet the results on the ground suggest that the potential of economic partnership and supply chain restructuring is yet to be tapped. Japan's share in India's trade has been falling, especially in India's exports, despite the CEPA. Although the JETRO surveys corroborate that Japanese companies consider India the most promising and profitable market, Japanese FDI accounts for only 6% of total FDI inflows received by India since 2000.

What can be done to tap the potential of India–Japan economic partnership for supply chain restructuring? A few thoughts are offered below as a way forward.

- Create an India-focused dedicated fund to support Japanese FDI in India under the Supply Chain Diversification Programme: Although investments in India are eligible for support under the US$2 billion Supply Chain Diversification Programme, the bulk of the funding has gone to support investment projects in Viet Nam and other ASEAN Member States. A separate India-focused fund of US$2 billion to incentivise investment in India could be earmarked and replenished once exhausted. This fund could have two windows: (i) for labour-intensive industries (e.g. textiles and garments, footwear, toys, food processing, and furniture), which could benefit micro, small, and medium-sized enterprises (MSMEs) as they integrate with the supply chains of Japanese companies; and (ii) for sunrise sectors (e.g. electronics and semiconductors,

solar PV, advanced batteries, EVs, electrolysers, wind turbines, machine tools, machinery, ship building and other heavy industries). The creation of an India-focused fund would also indicate to Japanese companies the priority that the Japanese government and the leadership attach to deepening economic partnership with India.

- Review of India–Japan CEPA to make it effective: The India–Japan CEPA was signed with the expectation that it would help to tap the potential of India–Japan economic partnership, especially by facilitating supply chains restructuring to India to help Japanese companies produce in India for local and global sourcing, particularly in labour- and skill-intensive sectors. However, that potential is far from being exploited. The two governments need to urgently conduct a review of the CEPA in consultation with businesses in both countries to identify problem areas that prevent it from fulfilling its potential. Such a review could identify the non-tariff and process-oriented barriers that Indian exporters face in exporting labour-intensive goods (e.g. textiles, garments, and processed foods) to Japan, and recommend the need for capacity building, especially of MSMEs, to comply with those standards. The CEPA's chapter on Economic Cooperation has provisions for such capacity-building support and should be leveraged for this purpose.
- Targeting of Japanese companies by Indian investment promotion agencies: Even though a dedicated window has been provided to Japanese investors at Invest India, India's investment promotion agency, FDI inflows from Japan have not been commensurate with India's potential. Hence, proactive targeting may be necessary. Invest India should conduct a survey of Japanese multinational companies that do not have operations in India and identify those that specialise in India's priority sectors (such as those identified above). These companies could include firms that export to India but do not have production bases in the country. They could also include retail giants such as Daiso, which could help to develop a vendor base of Indian MSMEs, helping them to integrate into global supply chains.
- Fostering policy research on India–Japan supply chain restructuring: The criticality of supply chain diversification, especially in the context of the global trade policy uncertainties and incipient Trump tariffs, requires sustained efforts aimed at understanding the emerging opportunities and highlighting the policy measures to realise them in a mutually beneficial manner. This gap could be filled through the creation of centres of advanced policy research on India–Japan economic partnership and supply chain resilience in India and Japan. This could be done by instituting collaborative research programmes (or research chairs) at a few select policy research institutions in India and Japan focused on the manufacturing sector and supply chain restructuring.

In summary, strengthening supply chain resilience is vital given their current heavy dependence on a single country. The India–Japan economic partnership holds the potential to create alternative supply chains by leveraging complementary strengths and synergies, while also supporting India's economic development and generating

decent jobs for its youthful workforce. The time has come to harness the deepening strategic partnership between the two countries to build supply chains that serve not only their mutual interests but also the global economy at large.

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Chapter 2

Making India's Trade Relations with Japan More Favourable*

Danish A. Hashim

Introduction

Economic cooperation between India, the world's fifth largest economy, and Japan, the fourth largest (Forbes India, 2025), has traditionally been strong, and has been given high importance on both sides. The two countries share a long-standing, harmonious relationship (dating back to the significant year of 1952 when both signed a Treaty of Peace) that is based on mutual respect, democratic values, and a commitment to economic and technological growth. Economic reforms introduced in India since the early 1990s have provided further impetus to the economic cooperation between the two countries. India's 'Act East Policy', launched in 2014 (replacing the earlier 'Look East Policy'), aims at fostering stronger economic, strategic, and cultural ties with countries in the Asia-Pacific region. Japan's 'Free and Open Indo-Pacific' vision, with an overreaching objective to promote and establish the rule of law, freedom of navigation, and free trade with countries in the Indo-Pacific region, has further augmented the scope of economic cooperation (Embassy of India, 2024; Ministry of External Affairs, Government of India, 2017).

A major breakthrough in the India–Japan partnership came in 2011 when the two countries signed the Comprehensive Economic Partnership Agreement (CEPA) to strengthen bilateral engagements and subsequently worked towards eliminating tariffs on 90% of Japanese exports to India (such as auto parts and electrical appliances), and 97% of imports from India (including agriculture and fisheries products) by 2021 (ORF, 2014).

Even as India and Japan have laid great emphasis on promoting economic engagement through a plethora of initiatives, trade relations between them continue to offer much scope for improvement. This is clear given that their individual trade engagement with the rest of the world has prospered more than the trade engagement between themselves, despite numerous initiatives, including the signing of CEPA in 2011. Between 2011 and 2022, India's imports from Japan grew at 3.1% (compound annual growth rate) (World

* The signing of the Comprehensive Economic Partnership Agreement between India and Japan in 2011 and numerous other initiatives were expected to provide momentum to trade relationships between the two countries. The actual performance has, however, fallen short of expectations from India's point of view, which has witnessed a rising trade deficit with Japan. Given the strong complementarity that they enjoy, there is a potential to turn the trade in India's favour as well, by unlocking its potential in global value chains with Japan.

Bank, n.d.), even as its total imports from the world grew at a much faster rate of 4.2%. Similarly, India's exports to Japan in this period expanded by a mere 0.2%, much slower than the pace of its exports to the world at 3.7%. Japan, however, saw its exports to India rising to around 3.0% even when its exports to the world contracted to 0.9% during the period. Japan and India's imports from the world grew negligibly during the period. As a net outcome, India has witnessed deterioration in its trade balance with Japan post signing of CEPA, necessitating a review of the agreement to ensure that it benefits both partners by harnessing their complementarity. Efforts are underway to review the terms of CEPA to give a boost to bilateral trade (Kesavan, 2020).

Making the trade balance more favourable to India is central to promoting economic relations between India and Japan. This can be done by unlocking the potential of India's global value chains (GVCs), leveraging the high degree of complementarity between the two economies. Both countries have unique strengths in different areas. This can be utilised to enhance India's GVC participation which stood at 34.9% in 2020 and was lower than Japan's, which stood at 39.7% (OECD, n.d.). While India has been the fastest-growing major economy in the world over the past several years, Japan has a distinct advantage in advanced technology. With global supply chains becoming increasingly interconnected and technology-driven, India and Japan have been positioning themselves as critical players in driving innovation, investment, and economic integration across the Indo-Pacific. India, with its expanding industrial capabilities, large consumer base, and rapidly growing economy, offers vast opportunities for Japanese companies seeking to diversify supply chains and access emerging markets. Japan, on the other hand, brings expertise in advanced technology, high-quality manufacturing, and a larger share in cutting-edge industries, which, in turn, complements India's potential. Together, the two nations have significant scope to leverage their synergies, advancing resilient and sustainable growth.

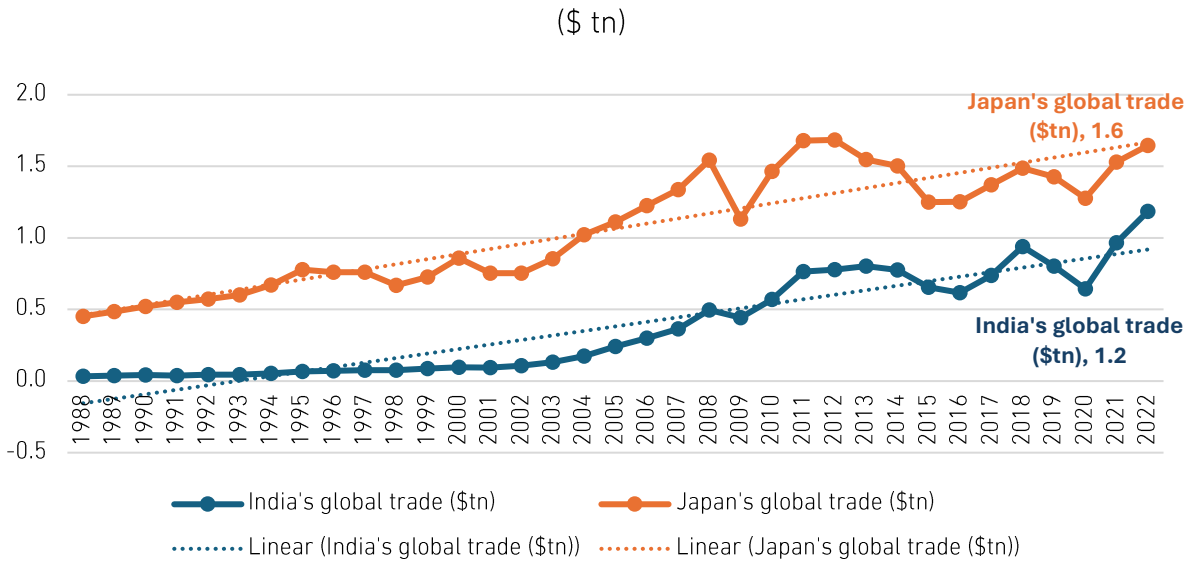
The present article aims to explore the potential of furthering India–Japan trade relations in a way that both the partners complement each other and reap shared benefits. Trade opportunities are discussed in a framework of promoting India's participation in GVC with Japan, critical for promoting a trade balance between the two partners on a sustainable basis.

The next section examines the past trends and major policy initiatives that have shaped the trade cooperation between India and Japan. The third section analyses India's GVC participation in select sectors, compared to its peers, followed by a section on key policy suggestions. The last section concludes.

India–Japan Trade Relations

It would be instructive to view the trade relations between India and Japan in the context of their global participation, where they are important players. In 2022, India's global trade was $1.2 trillion whereas that of Japan was $1.6 trillion (Figure 2.1). India stood in 20th position, accounting for 2% of global exports, while Japan ranked 5th with a 3.3% share in global exports. Interestingly, trends in the two countries' global trade, recorded since 1988, appear similar in the 2000s. Unlike Japan, India's trade in the 1990s remained low and grew at a negligible pace (World Bank, n.d.).

Figure 2.1: Trends in the Global Trade of India and Japan



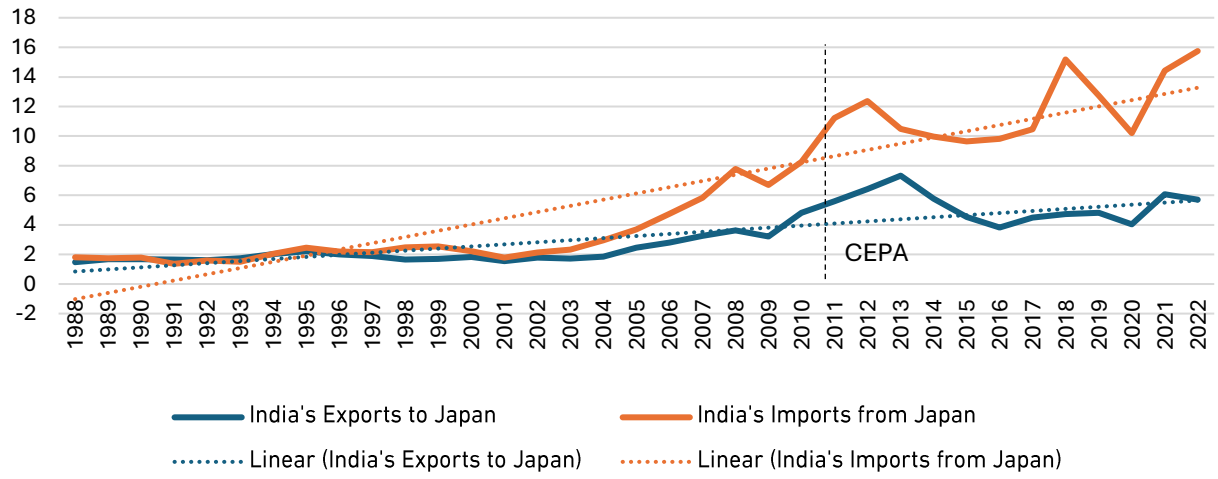
$ = US dollar, tn = trillion.
Source: World Bank (n.d.).

Bilateral trade between India and Japan, captured through India's imports from, and exports to, Japan since 1988, as shown in Figure 5.2, show a noteworthy trend. India's exports and imports from Japan measured around the same level and largely remained stagnant until around 2001. This was when India's overall trade was also low and registered global expansion. Once India's global trade started picking up post 2001, its imports grew much faster than its exports to Japan and the gap has continued to widen over the years. In 2022, India imported around three times more than its exports to Japan.

Another notable emerging trend is that the trade between the two countries had started to pick up a few years prior to the signing of CEPA in 2011. Barring a few years, there is not much evidence to show that CEPA has been particularly successful in bringing about incremental change in bilateral trade, at least from India's point of view. This is also evident because India's exports to Japan as a share of its global exports has assumed a sharp declining trend in the post-CEPA years, as can be seen in Figure 2.3. On the other

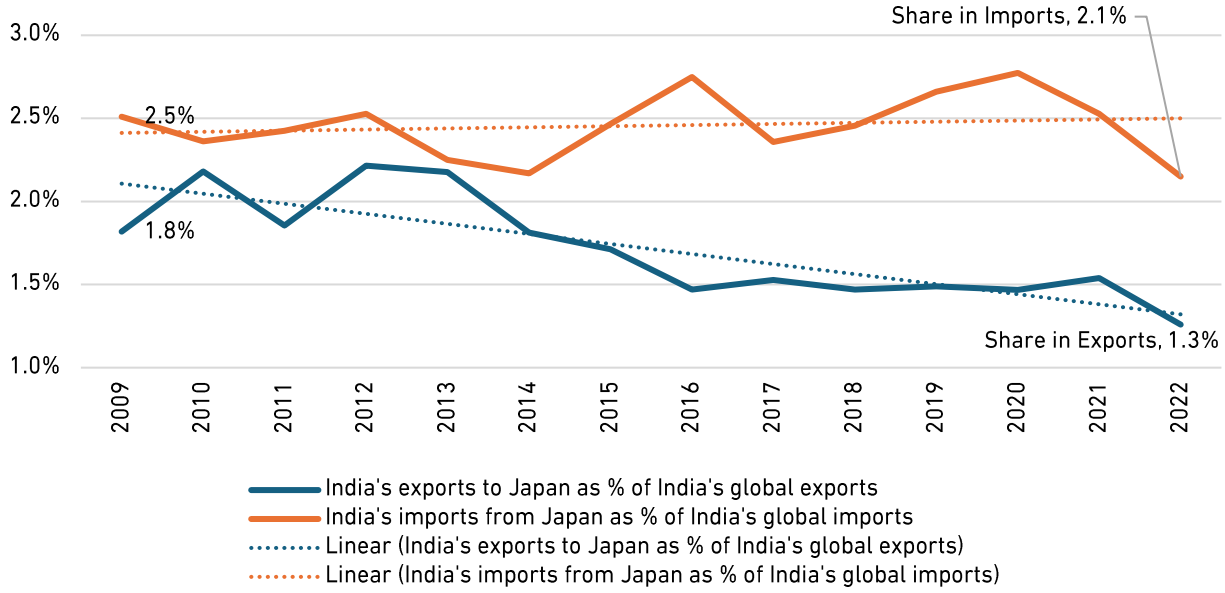
hand, there is a marginal upward trend in imports from Japan, as a share of its total imports, a part of which could possibly be attributed to CEPA.

Figure 2.2: Bilateral Trade between India and Japan ($ billion)



$ = US dollar, CEPA = Comprehensive Economic Partnership Agreement.
Source: World Bank (n.d.).

Figure 2.3: Share of Japan in India's Global Exports and Imports (%)



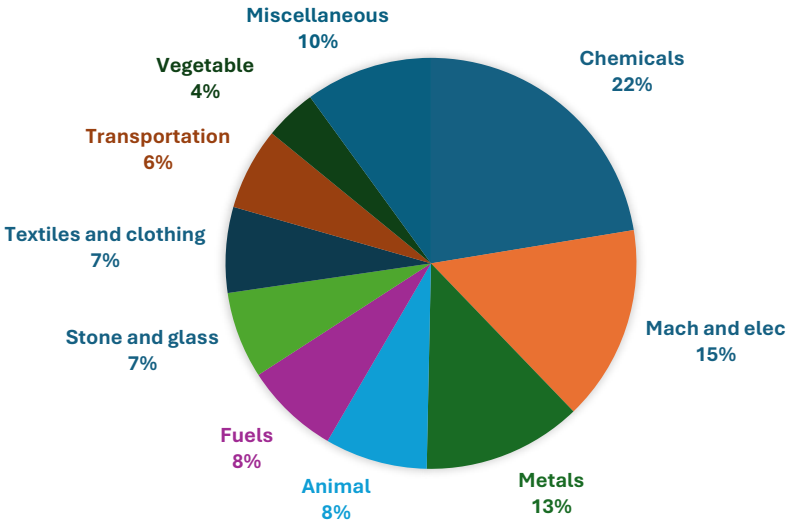
% = percent.
Source: World Bank (n.d.).

India's top exports to Japan in 2022 included chemicals (22%), machinery (15%), metals (13%), animal products (8%), and fuels (8%), whereas its major imports from Japan included machinery (27%), chemicals (22%), and metals (20%) (Figures 2.4 and 2.5) (World Bank, n.d.). This highlights the complementary nature of the trade relationship, while also

showcasing opportunities for India to increase its high-value and technology-driven exports.

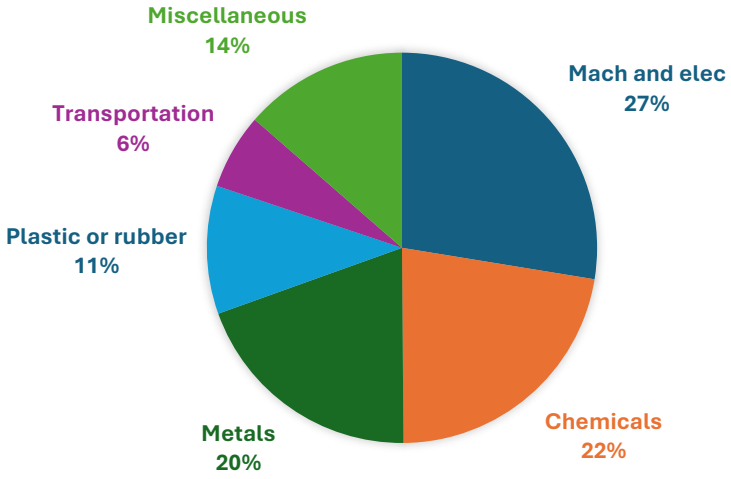
Figure 2.4: India's Exports to Japan in 2022

(%)



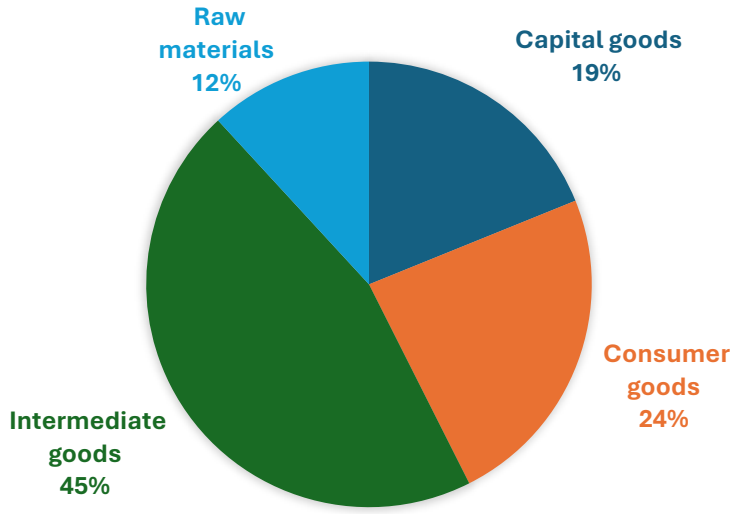
% = percent, Mach and elec = machinery and electrical equipment (includes electronics).
Source: World Bank (n.d.).

Figure 2.5: India's Imports from Japan in 2022 (%)



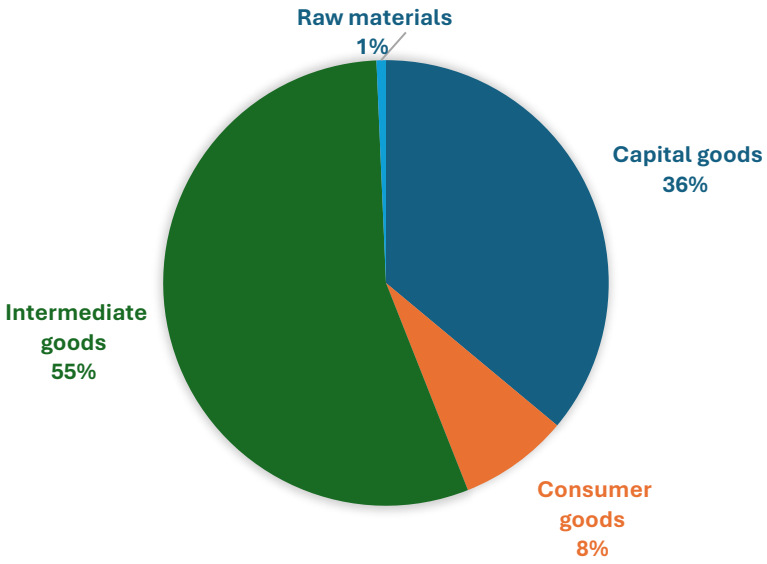
% = percent, Mach and elec = machinery and electrical equipment (includes electronics).
Source: World Bank (n.d.).

Figure 2.6: India's Export to Japan in 2022, Category Share (%)



% = percent.
Source: World Bank (n.d.).

Figure 2.7: India's Import from Japan in 2022, Category Share (%)



% = percent.
Source: World Bank (n.d.).

Global Value Chain Participation

Discussion in the previous sections indicated that signing CEPA did not have much benefit for India's exports to Japan, whereas its imports from Japan increased at a reasonably good pace. Many of the imports from Japan, however, were intermediate goods (followed by capital goods), which could have directly and indirectly influenced India's higher participation in GVCs, thereby promoting its manufacturing capabilities, increasing gross domestic product and job creation, and unlocking export potential. India has increasingly been both importing and exporting intermediate goods to Japan (Figures 2.6 and 2.7), which needs to be expanded to foster GVCs linkages. Interestingly, on the export front, capital goods have a share below 20%, which must be enhanced for India to move up and lead at upper ends in GVCs. Imports of capital goods are a good proxy indicator for promoting rapid economic development, especially when a country is at its lower stages. However, this aspect needs to be streamlined for India to capture higher rents in GVCs, using more research and development and a stronger innovation ecosystem, amongst other things.

GVCs provide linkages of production and distribution involving multiple countries and firms, encompassing various stages of value addition. GVCs drive efficiency through specialisation, facilitate technology transfer, promote productivity, and create employment. Linking into GVCs could either be through forward linkages (where a country provides inputs into the exports of other countries) or through backward linkages (where a country imports intermediate products to be used in its exports).

The participation of a country in GVCs can be measured through a sequential production process. It can be measured as the sum of 'foreign value-added in its gross exports' (backward linkages, or imports of foreign value-added) and its 'domestic value-added that contributes to other countries' gross exports' (forward linkages, or exports of domestic value-added). A country's share of the total value-added created through both forward and backward linkages in GVCs (i.e., summed across all countries) provides a measure of the extent of its participation and the relative gains it derives from GVCs (Banga, 2013). The combined estimates of backward linkages and forward linkages can be represented through the GVC Participation Index to facilitate comparative analysis. The value of the index lies between 0 and 100, indicating a range of least to maximum integration in GVCs.

The GVC Participation Indices for India and Japan for 2020 have been estimated at sectoral as well as aggregate levels, and the findings are reported in Table 2.1. While focusing on bilateral trade, India and Japan stand to benefit from building linkages through the Association of Southeast Asian Nations (ASEAN) region and Australia. We have, therefore, also estimated and reported GVC indices for ASEAN and Australia in the table.

At the aggregate level, India's index measured 34.9%, lower than the values of ASEAN at 45.7% (resulting from deep integration amongst the participating economies across sectors), Japan's index stood at 39.7% (with strong manufacturing and technology

prowess), and Australia's was 35.0% (reflecting its resource-export-driven economy) (OECD, n.d.).

India's participation in GVCs through backward linkages is estimated to be 17.2%, higher than the corresponding values of Japan (13.3%) and Australia (9.4%) but lower than the value of ASEAN (30.9%). India must continue to strengthen its backward linkages as it is found to be especially useful for developing countries in promoting exports, domestic value-added, and employment (Veeramani and Dhir, 2022).

India's forward linkages stood at a mere 9.5%, behind both Japan's 18.9% and ASEAN's 10.6% (OECD, n.d.). This suggests that India's exports are less embedded in advanced value chains, underscoring the need for a focus on high-value goods and technology-driven industries.

India's manufacturing sector shows strong backward linkages of 27.0%, much better than Australia (14.1%) and Japan (16.8%). However, the forward linkages cause concern. Their value is only 9.5% as against the figures of 21.0% (Australia) and 18.8% (Japan). The country must work towards promoting its exports of intermediate goods to be better connected in GVCs. Japan and Australia have demonstrated stronger forward linkages indices, leveraging advanced manufacturing and high-value exports.

India's GVCs performance in the service sector is comparable to Australia and Japan in both backward and forward linkages, reflecting its competitive strength in information technology and business process outsourcing sectors. The country's forward linkages and backward linkages in services measured 7.1% for information technology and 8.2% for business process outsourcing. ASEAN's superior integration in backward linkages at 27.7% could perhaps be taken as a benchmark for India to aspire to, especially given the growth of Global Capability Centres in the country.

Table 2.1: Linkages in Global Value Chains – Comparison of India, the Association of Southeast Asian Nations, Japan, and Australia in 2020(%)

Country/region	All sectors	Agriculture	Mining	Manufacturing	Construction	Services
GVCs Participation Index						
Australia	35.0	11.1	8.4	35.1	13.8	12.0
Japan	39.7	11.6	15.1	35.7	0.0	14.4
India	**34.9**	**3.1**	**14.5**	**36.5**	**0.0**	**15.3**
ASEAN	45.7	16.8	15.7	45.5	22.6	31.3
Backward Linkages in GVCs						
Australia	9.4	10.9	7.9	14.1	13.8	8.3
Japan	13.3	11.4	14.4	16.8	0	7.8
India	**17.2**	**2.8**	**13.7**	**27**	**0**	**8.2**

ASEAN	30.9	16.6	15.2	34.9	22.6	27.7

Forward Linkages in GVCs						
Australia	25.6	0.2	0.5	21	0	3.7
Japan	26.4	0.2	0.7	18.9	0	6.6
India	**17.7**	**0.3**	**0.8**	**9.5**	**0**	**7.1**
ASEAN	14.8	0.2	0.5	10.6	0	3.6

% = percent, ASEAN = Association of Southeast Asian Nations, GVCs = global value chains.
Source: OECD (n.d.).

To explore opportunities for India in GVCs, we examine the performance of the country in a few select manufacturing sectors and make a comparison with Japan, Australia, and the ASEAN region. Key features emerging from the trends, shown in Figures 2.8–2.12, are the following: (i) In all the select sectors, India's performance in backward linkages is much better than that in forward linkages. This is in consistent with expectations as there is abundant comparative advantage for the country in numerous sectors where it can import cheaper raw materials and intermediate goods, process them, and export. (ii) In all the sectors and in virtually all years, India's backward linkages have remained well below the levels of Japan, Australia, and ASEAN. There is, thus, a significant potential for India to improve its performance in backward linkages by leveraging high-technology imports of intermediate goods, which can be obtained at potentially lower costs. Achieving cost-effective intermediate goods is crucial for India to competitively process these intermediates and export the resulting finished products to the global market.. (iii) Even though the value of forward linkages across sectors are low, India has done well when compared with other economies within the sample. There is, however, potential for India to do better by focusing more on exports of high-value, intermediate goods. The country has a vast potential to boost its exports at the higher ends of many services and high-value manufacturing products, rather than remaining confined to the exports of basic raw materials and low-value manufacturing products. Addressing these gaps is crucial for India to move up the value chain and capture a larger share of higher-value goods in global markets.

Figure 2.8.a. Backward Linkages in Transport Equipment (%)

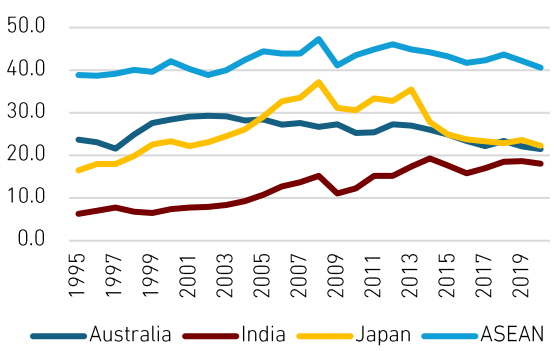


Fig 2.8.b. Forward Linkages in Transport Equipment (%)

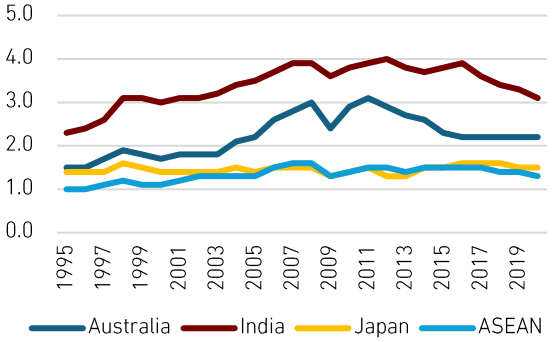


Figure 2.9.a. Backward Linkages in Electronics (Computers, Electronics and Electrical Equipment) (%)

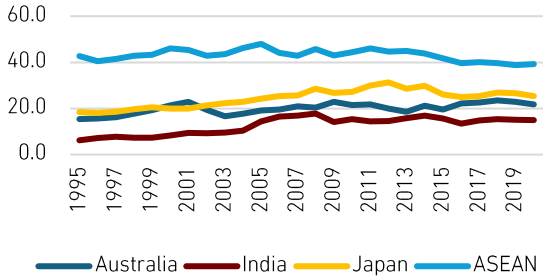


Figure 2.9.b. Forward Linkages in Electronics (Computers, Electronics and Electrical Equipment) (%)

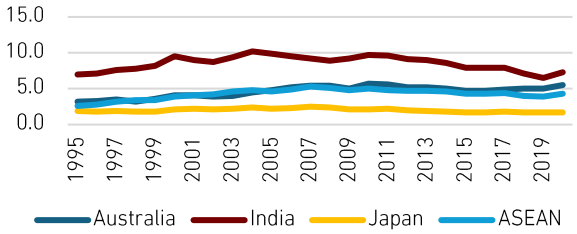


Figure 2.10.a. Backward Linkages in Pharmaceuticals (%)

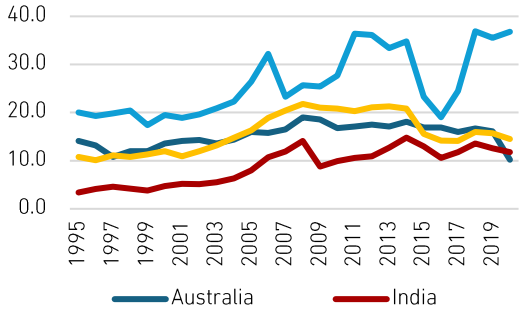


Figure 2.10.b. Forward Linkages in Pharmaceuticals (%)

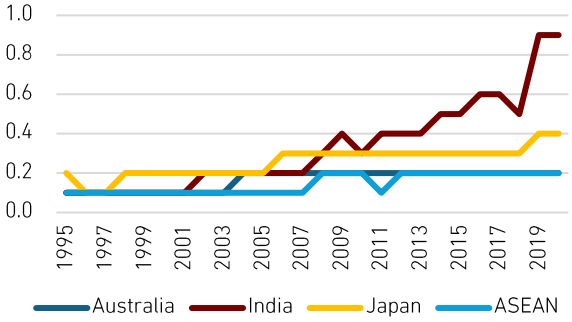


Figure 2.11.a. Backward Linkages in the Chemical Sector (%)

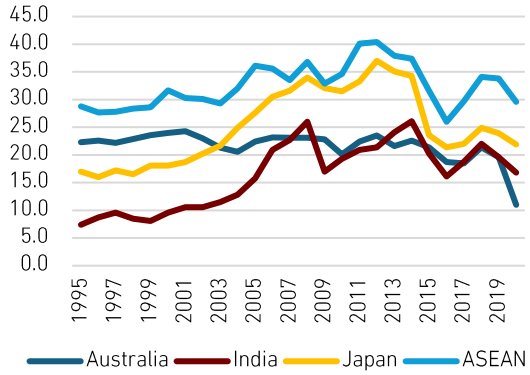


Figure 2.11.b. Forward Linkages in the Chemical Sector (%)

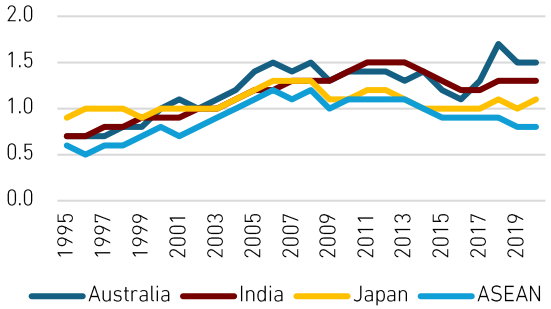


Figure 2.12.a. Backward Linkages in Textiles, Wearing Apparel and Leather Products (%)

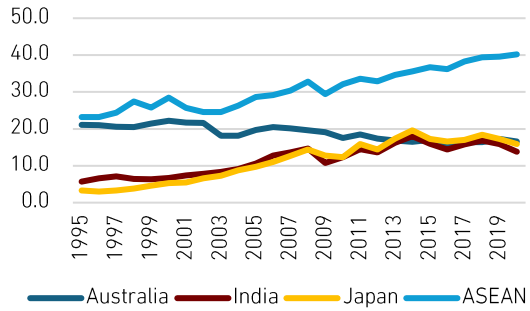
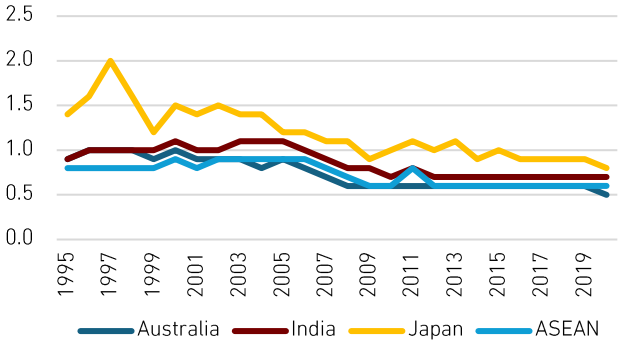


Figure 2.12.b. Forward Linkages in Textiles, Wearing Apparel and Leather Products (%)



% = percent, ASEAN = Association of Southeast Asian Nations, GVC = global value chain.
Source: OECD (n.d.).

Some Key Suggestions

India and Japan are well-positioned to emerge as pivotal players in the global economy, leveraging their complementary strengths through strategic partnerships. To further enhance trade cooperation, the following measures are suggested.

- Diversification of trade baskets. India and Japan should diversify their export and import baskets by focusing on sectors like chemicals, pharmaceuticals, automobiles, critical minerals, and services. This diversification can be achieved by identifying a wider range of potential products/segments in these sectors and increasing the trade volume of existing ones. This, in turn, would require India to further build its productive capabilities, including infrastructure, human capital, and technological advancements.

Expanding trade into these sectors will not only reduce dependency on traditional commodities but will also enhance their overall bilateral trade.

- Addressing India's unfavourable trade balance. To address the trade deficit in favour of Japan, it should facilitate easier access to its markets for Indian goods and services. Reducing tariffs and non-tariff barriers, coupled with targeted promotional campaigns for Indian products, can help level the trade dynamics. Such measures will help Indian exporters to compete more effectively in Japan's highly regulated and competitive market.
- Tackling key non-tariff barriers. Japan should support India to resolve challenges posed by key non-tariff barriers, such as stringent standards and sanitary and phytosanitary regulations.
- Enhancing trade facilitation. Both nations should work towards simplifying border procedures, such as reducing customs delays, enhancing digitalisation, and creating seamless logistics networks to ensure efficient movement of goods across borders. Further, there is a need to harmonise standards and regulations between India and Japan. Mutual recognition agreements on standards will greatly encourage smoother trade. Additionally, enhanced customs cooperation between India and Japan will greatly help to reduce border procedures and eliminate bottlenecks. Joint efforts to implement advanced technologies and data-sharing platforms can expedite customs clearance.
- Simplifying rules of origin. Japan should address the issues faced by exporters in India due to the complexity of rules of origin criteria.
- Utilising foreign direct investment for export growth. Foreign direct investment into India is generally market seeking rather than export oriented. Japan's foreign direct investment should be strategically channelled to bolster exports by creating globally competitive production hubs. By leveraging Japanese investments in high-value sectors, India can build robust supply chains and scale up export-oriented manufacturing.
- Increasing economic and technical cooperation in manufacturing. Economic and technical collaboration between India and Japan in manufacturing can boost industrial growth and innovation. Joint ventures and technology transfers in critical sectors such as electronics and automotive manufacturing will greatly enhance productivity and competitiveness.
- Developing intra-regional supply chains. Identifying and developing intra-regional supply chains connecting ASEAN, Australia, India, and Japan is crucial for greater economic integration. Some of the recent initiatives include the signing of the Supply Chain Resilience Initiative in 2021 amongst India, Australia, and Japan, as well as the launch of the Indo-Pacific Economic Framework for Prosperity in 2022, which also

involves ASEAN and other countries. Their progress needs to be closely monitored and effectively leveraged to enhance integration. Furthermore, collaborative efforts in sectors like electronics and food processing can strengthen regional resilience and unlock new trade opportunities.

- Collaboration with local firms. Japanese companies can enhance their impact by collaborating more with local Indian firms in the production process. This can be achieved through various means, including organising sourcing fairs along with the Government of India to connect Japanese companies with potential Indian suppliers, providing industry development assistance programmes to help Indian firms meet Japanese quality standards and integrate into supply chains, amongst others. This will help to boost the quality and competitiveness of locally made products while also encouraging knowledge transfer and skill development.

Conclusion

Historically, the economic partnership between India and Japan has been strong and strategically important for both nations. A significant milestone in this relationship was the signing of the CEPA in 2011, aimed at deepening bilateral trade and investment ties. While trade between the two countries had been on an upward trajectory prior to the CEPA, the post-agreement period has not yielded the anticipated benefits for India in terms of export growth. On the contrary, India's exports to Japan have declined, whereas imports from Japan have increased modestly, contributing to a widening trade deficit. More positively, India's imports from Japan have largely been of intermediate goods, which could be considered favourable for enhancing India's participation in GVCs.

Despite these developments, India's overall participation in GVCs remains limited compared to Japan. India demonstrates stronger integration through backward linkages than forward linkages, particularly in key sectors such as automobiles, electronics, pharmaceuticals, chemicals, and textiles and leather products. Nevertheless, while working to improve performance in forward linkages, special efforts must be made to further enhance India's participation through backward linkages. Amongst various key measures, the country should look at diversifying its trade basket, reducing tariff and non-tariff barriers, improving trade facilitation, fostering intra-regional supply chain linkages, and achieving greater collaboration between Japanese firms and local Indian firms.

In conclusion, India and Japan must now focus on leveraging their economic complementarities more strategically, transforming their trade relationship into a more balanced and forward-looking partnership. With continued collaboration in technology, innovation, and supply chain resilience, the two countries can redefine their bilateral trade trajectory in a way that it is mutually beneficial to both the partners.

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Chapter 3

India–Japan GVC Integration: New Investments and Supply Chains Amongst India, Japan, and ASEAN

Anita Prakash

Introduction

India's weight in the global economy has expanded rapidly, from 1.5% in 2002 to 3.5% in 2022, thanks to very rapid growth. This growth is mostly driven by domestic demand. Exports have stagnated, with the share of global merchandise exports remaining as low as 1.8%. As such, India could tap into huge external demand if it can increase its international competitiveness and integrate more into the global supply chains.

This chapter reviews the global value chain (GVC) performance and integration of India and Japan, both regionally and bilaterally. However, India–Japan supply chain linkages must also include linkages with the Association of Southeast Asian Nations (ASEAN), which is a major manufacturing and investment destination for Japan and other large economies such as China, the Republic of Korea (henceforth, Korea), the European Union (EU), and the United States (US). The data on GVC participation capture the exports and imports of intermediate goods, which feed other countries' exports. The advantage of such a data set, which focuses on trade in intermediate goods, is that it only counts the value added embedded in exports of the reporting country/region. More importantly, it elucidates the degree of integration in the value chains of trading partners. The trajectory of India's GVC participation suggests that India has been gaining ground and adding more value to GVCs, and its reliance on foreign value added has also significantly dropped thanks to continuous foreign direct investment (FDI) inflows that have bolstered the domestic supply chains.

India and Japan are on an uneven keel when comparing their respective participation in the regional GVCs. Japan promoted the original equipment manufacturer revolution in Southeast and East Asia. The competitiveness of ASEAN's exports and its manufacturing prowess are largely due to the early FDI from Japan in ASEAN Member States (AMS) during the 1970s and 1980s, particularly in Thailand and Indonesia, and later in Viet Nam for the automobile and electronics industries. Japan's investments in India, however, have only recently seen an upswing in the manufacturing sector. Cumulatively, from 2000 until December 2023, Japan's FDI in India has been around US$41.47 billion, ranking Japan fifth amongst source countries for FDI and accounting for 6% of total FDI in India. In recent years, Japanese FDI in India has mainly been in the electrical equipment, general

machinery, chemical and pharmaceutical, financial and insurance, construction, transportation, wholesale and retail, and services sectors (Embassy of India in Tokyo, 2024a).

On the other hand, ASEAN has been consistent in GVC participation but with huge dependence on China for both exports and imports, with more dependencies on imports from China, or backward participation in the GVC vis-à-vis China.

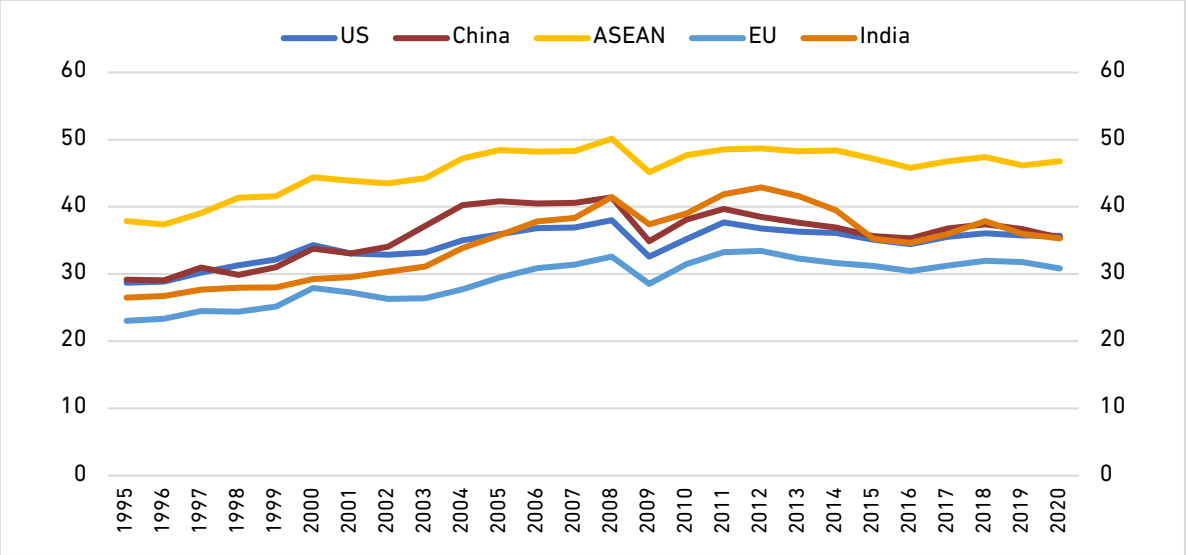
India has improved its GVC participation in several industries, such as chemicals, pharmaceuticals, machinery, and automobile parts and engines. India has also made much progress in global service value chains, especially in the information and communication technology (ICT) sector, in which India now creates 7% of global value added, only behind China in emerging markets.

India is expected to continue its rise in the GVCs, with its promising demography and the prevailing de-risking strategies in major economies regarding China. ASEAN too has an opportunity to consider structural adjustments and corrections in its GVC map, with greater integration with India and Japan than before. The review of the ASEAN–India Trade in Goods Agreement presents an important opportunity for reducing barriers to trade with ASEAN and greater integration with ASEAN both in trade and FDI. In an increasingly protectionist world, regional and trans-regional trade deals are increasingly important means for improved trade relations and supply chain integration.

Developments in Global Supply Chains

Globally, the size of GVCs peaked in 2008. Globalisation trends have recently halted, if not started reversing. Important members of the Indo-Pacific, such as Australia, India, Japan, the US, and the EU have seen moderate improvements in GVC participation since 2016. Most recent input–output data to measure supply chain integration are available up to 2023. For AMS, many of which are now members of the Regional Comprehensive Economic Partnership (RCEP), the Indo-Pacific Economic Framework for Prosperity (IPEF), and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the trend is similar, but their level of integration into GVCs is much higher than for several other Indo-Pacific countries, including India (Figure 3.1).

Figure 3.1: Total Global Value Chain Participation with the World
(% of gross exports)

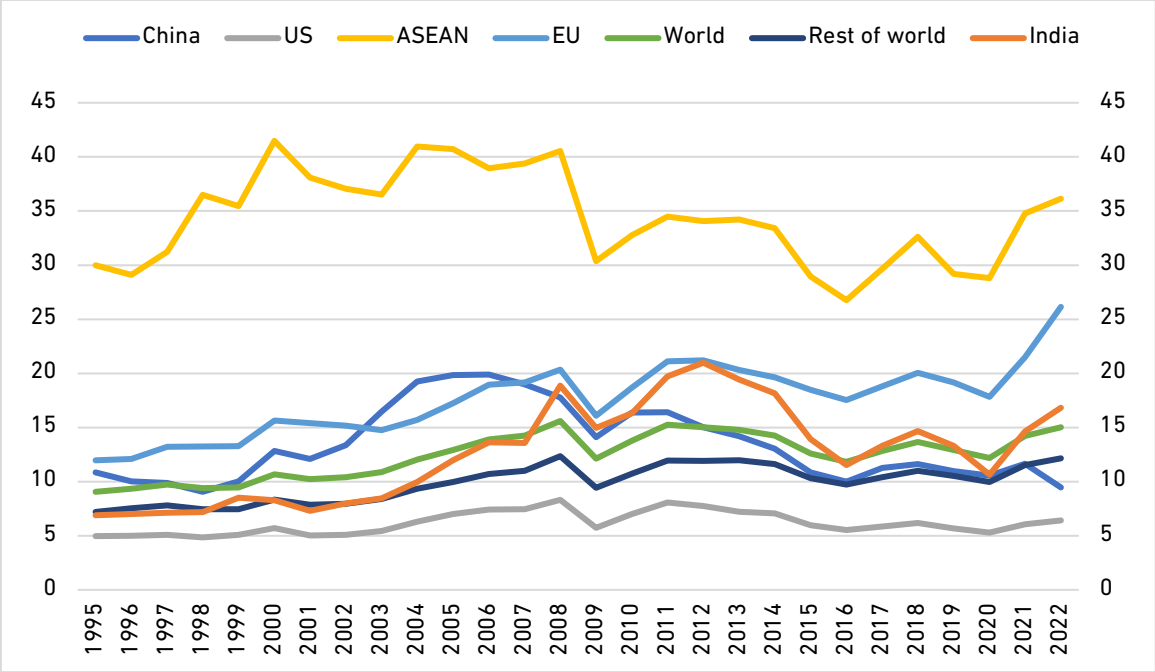


ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (4 July 2024).

The development of GVCs was prompted by transnational corporations to reduce their costs of production through efficiency gains. GVCs refer to international production sharing, a phenomenon whereby production is broken into activities and tasks are carried out in different countries. The ability of developing economies to tap into their comparative advantage of a cheap labour force through the liberalisation of trade and investment policy, and evolving environmental and labour regulations, has allowed them to gain more productive jobs and capital investment, raise productivity, and generate wealth. From Eastern Europe to China, and most recently Viet Nam and even Bangladesh, the process has lifted millions out of poverty. Indeed, GVCs have shaped the world beyond trade, from the increasing importance of efficiency as a key objective of the production process – and the development of new business models to accommodate it – to the surge in FDI to set up production plants overseas to produce parts and components.

The globalisation process has decelerated significantly, if not started to reverse (García-Herrero, 2022). Figure 3.2 shows the imports of intermediate goods as a share of gross domestic product (GDP), which has generally drifted lower post-global financial crisis for major exporters, especially in emerging markets such as China, India, and ASEAN. It is worth noting, however, that the share of intermediate goods imports has been lifting again in some countries and regions since the coronavirus disease (COVID-19) pandemic began, such as in India, ASEAN, and the EU.

Figure 3.2: Imports of Intermediate Goods
(% of GDP)

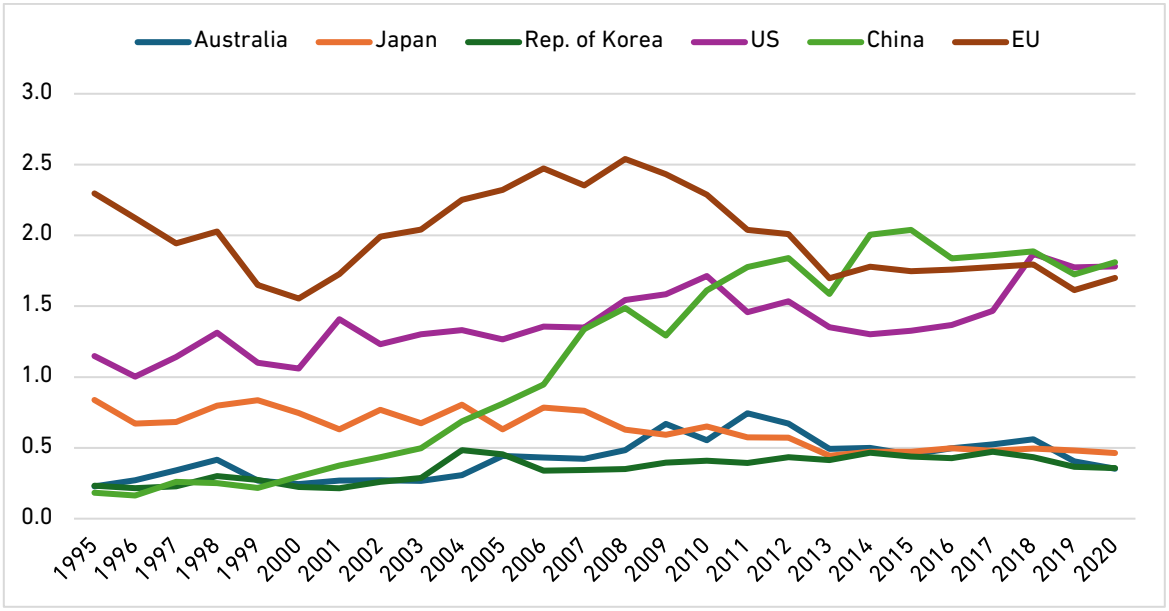


ASEAN = Association of Southeast Asian Nations, EU = European Union, GDP = gross domestic product, US = United States.
Source: UNCTAD (2024), Merchandise: Total Trade Growth Rates, Annual. https://unctadstat.unctad.org/datacentre/dataviewer/US.TradeMerchGR (accessed 4 July 2024).

India, Japan, and ASEAN GVC Integration Performance

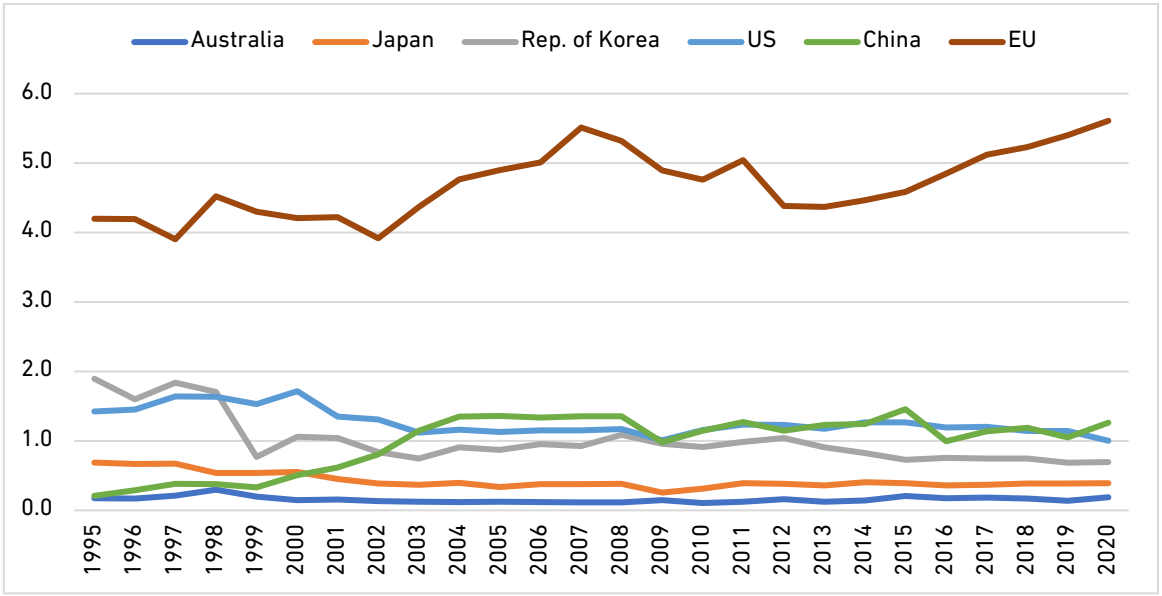
While Japan and ASEAN were better integrated into the regional and global value chains in 2009, India has since been rising in terms of integration into the value chain. The integration has been asymmetric, though. India's imports of intermediate goods to re-export (backward participation) have gone down, while its exports of intermediate goods for other countries to re-export have increased, including with ASEAN (Figures 3.3 and 1.4).

Figure 3.3: India's Backward Participation by Partner
(% of gross exports)



ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1 July 2024).

Figure 3.4: India's Forward Participation by Partner
(% of gross exports)



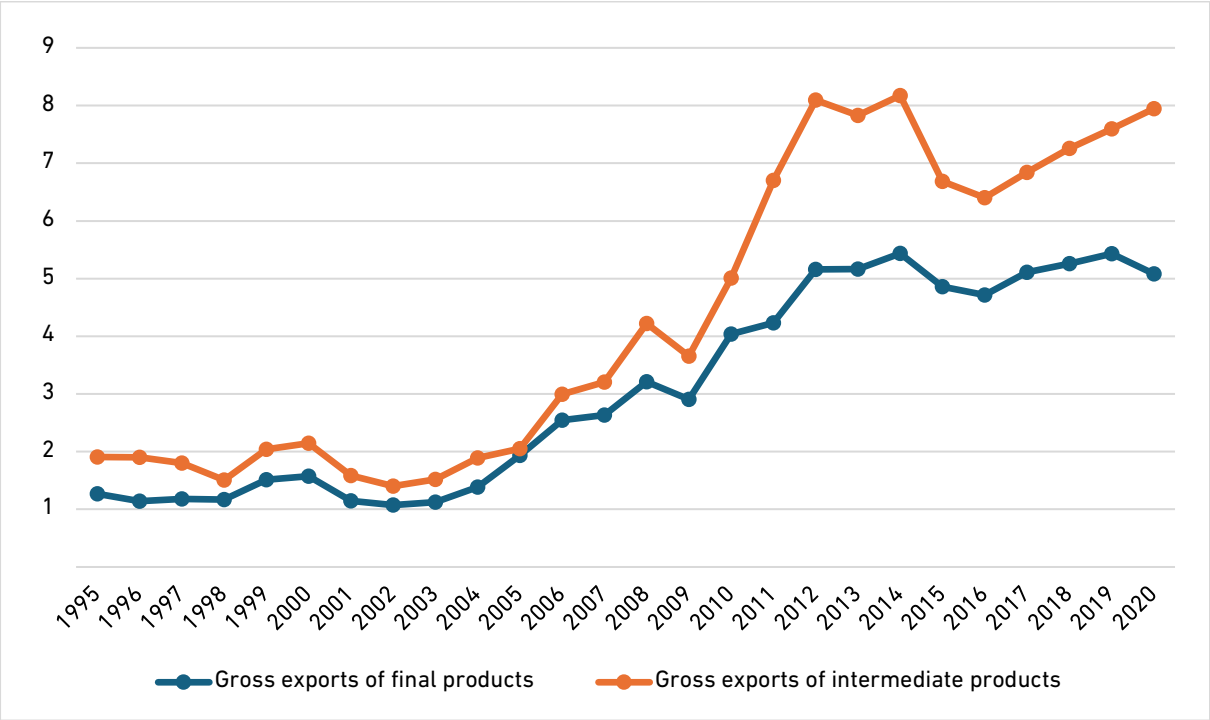
ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1 July 2024).

When we zero in on India–Japan GVC integration, the trend is consistent with the above figures. India's exports to Japan are on the rise, both for gross exports of final goods and intermediate goods, which is also explained by India's growing forward participation by

partners (Figure 3.5). India is sending more intermediate goods to Japan for Japan's exports to third countries.

Figure 3.5: India's Gross Exports to Japan, Final and Intermediate Goods, 1995–2020

(US$ billion)

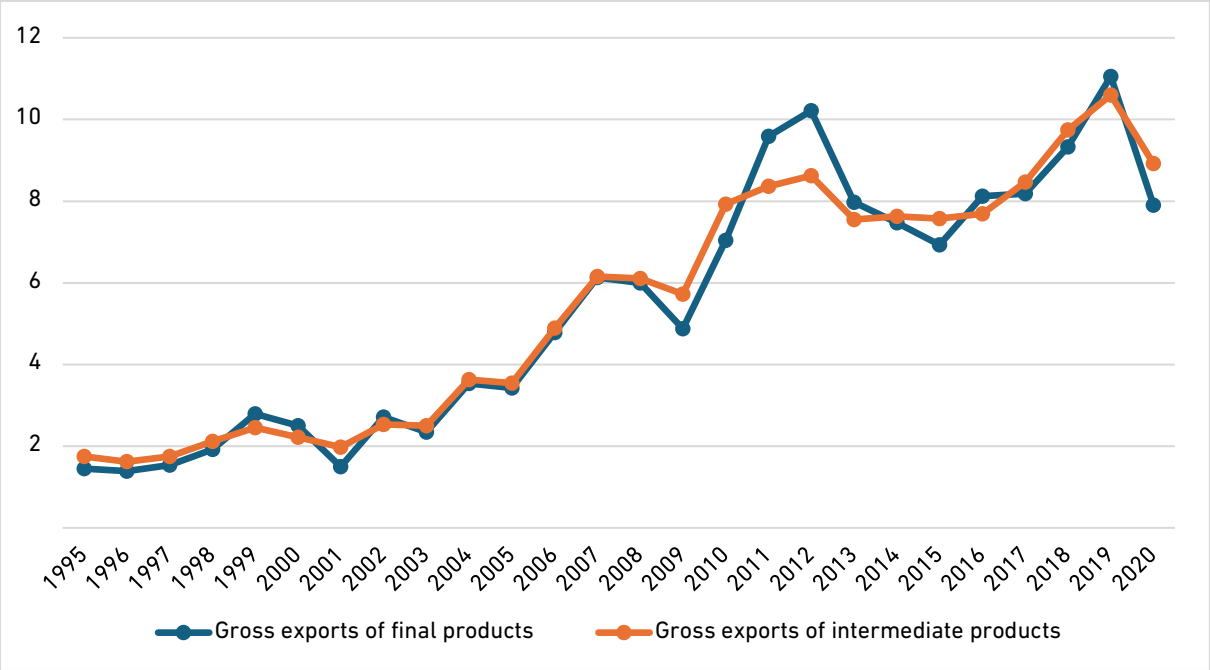


Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

The value of Japanese exports of intermediate goods to India in 2020 was US$8.9 billion, only just ahead of India's exports of intermediate goods to Japan (US$7.9 billion) during the same year (Figure 3.6). Given India's ongoing efforts to grow its manufacturing sector, there is potential for increased investment in the manufacturing sector in India and to support India to grow its backward participation in the GVCs both with Japan and other manufacturing hubs in ASEAN.

Figure 3.6: Japan's Gross Exports to India, Final and Intermediate Goods, 1995–2020

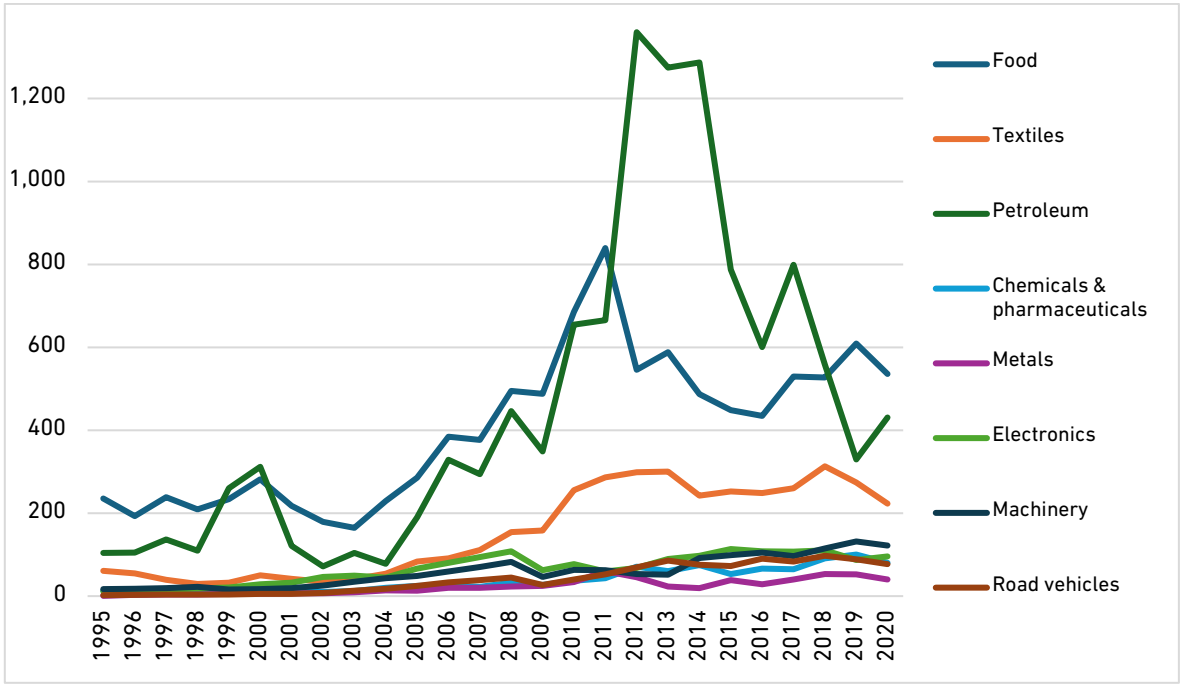
(US$ billion)



Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

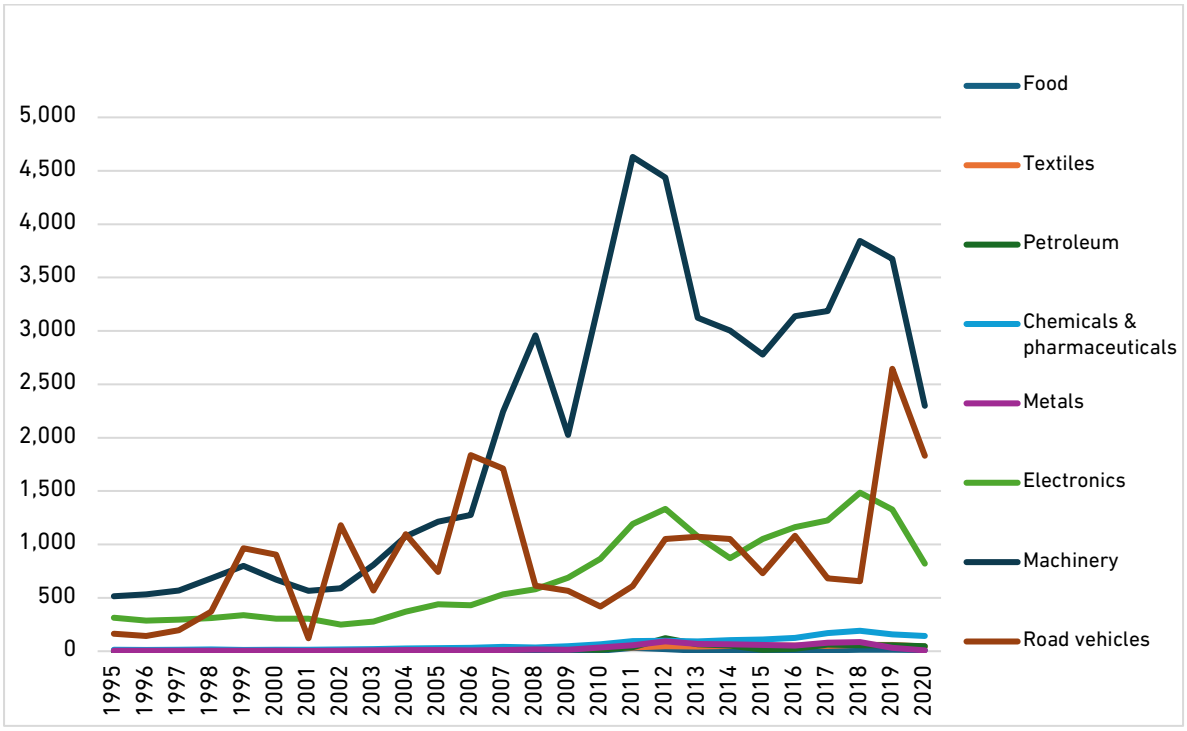
Amongst the reported manufacturing industries, India's exports of final products to Japan are more varied than Japan's exports of final products to India. India sends finished petroleum, food, textiles, electronics, and machinery products (Figure 3.7). Japan's exports of final products to India are dominated by three industries – automobiles, electronics, and machinery – and to some degree chemicals (Figure 3.8).

Figure 3.7: India's Manufacturing Industry Exports to Japan
(US$ million)



Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

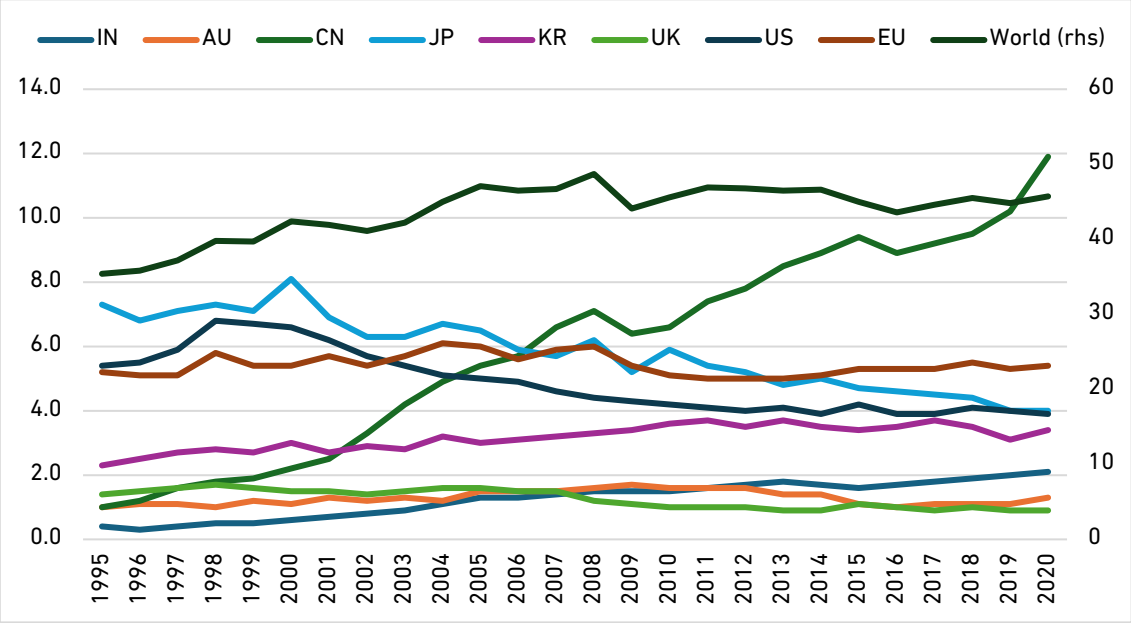
Figure 3.8: Japan's Manufacturing Industry Exports to India
(US$ million)



Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

During the same period, ASEAN has consolidated its position in the GVC, albeit with huge dependencies in the manufacturing in China. ASEAN integration with large, developed economies has declined since its peak in the late 2000s, keeping a steady negative trend vis-à-vis the US and Japan, while we observe a partial recovery with respect to the EU. On the other hand, ASEAN has become increasingly integrated with China, which has become the main individual partner in GVCs (Figure 3.9). Its integration with India has also grown during the same period, but the 'China centrality' in GVCs is remarkable. Within developed economies, a steady negative trend has been observed for ASEAN integration with the US and Japan since its peak in the late 2000s. In contrast, a partial recovery took place in recent years with respect to the EU, which remains the main integration partner for ASEAN amongst developed economies.

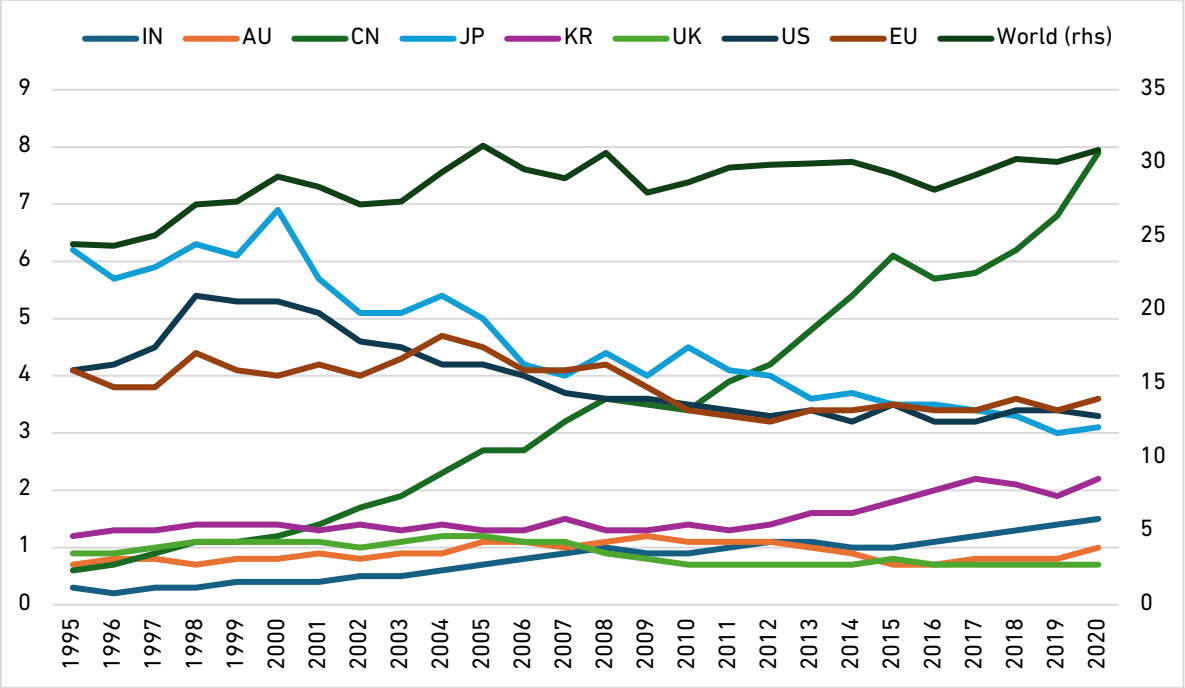
Figure 3.9: ASEAN's Total Global Value Chain Participation by Partner
(% of gross exports)



Note: ASEAN = Association of Southeast Asian Nations, AU = Australia, CN = China, EU = European Union, IN = India, JP = Japan, KR = Republic of Korea, rhs= right-hand side, UK = United Kingdom, US = United States. Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

On a structural basis, the GVC integration of ASEAN with other economies predominantly corresponds to backward participation, i.e. importing foreign products that are incorporated into ASEAN exports (Figure 3.10). The share of foreign value added in gross exports – or backward integration – accounts for almost two-thirds of ASEAN participation in GVCs, stressing its global upstream position as final exporter.

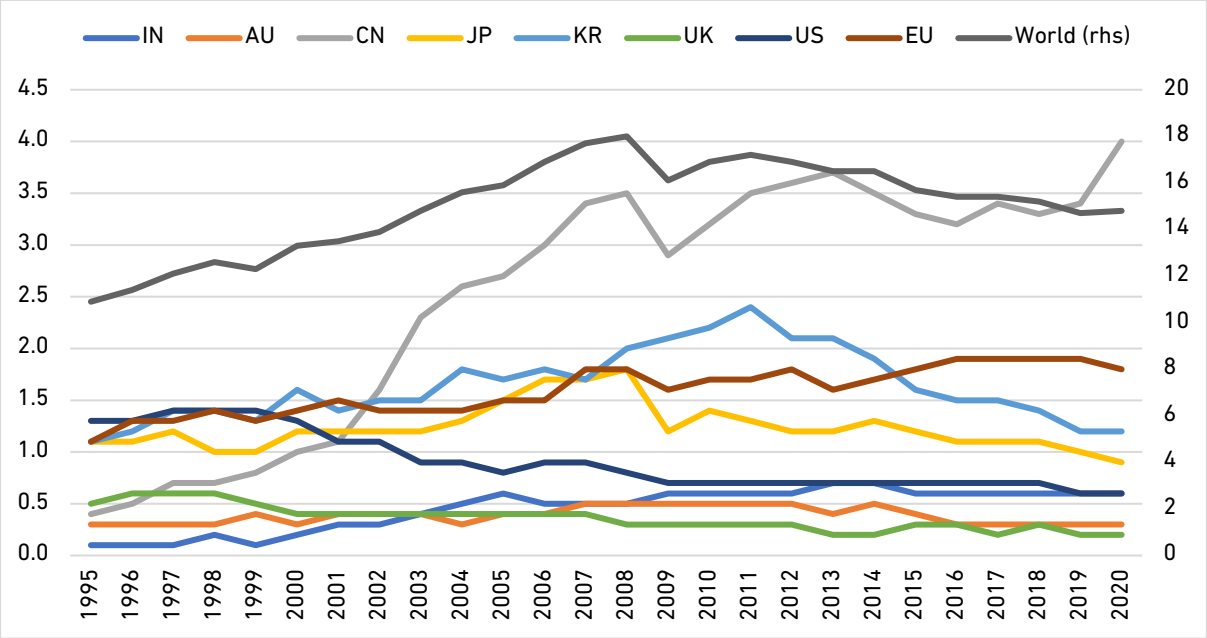
Figure 3.10: ASEAN's Backward Participation by Partner
(% of gross exports)



Note: ASEAN = Association of Southeast Asian Nations, AU = Australia, CN = China, EU = European Union, IN = India, JP = Japan, KR = Republic of Korea, rhs= right-hand side, UK = United Kingdom, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

This contrasts with the predominant role of the share of domestic value added in foreign exports – or forward integration – in the US and Japan, both specialised in intermediate exports (Figure 3.11). This trend is particularly strong vis-à-vis the US and Japan, while it is more balanced with the rest of the world. The nature of bilateral integration has changed over time, positioning ASEAN more upstream with respect to the EU and downstream with respect to China, accounting for greater participation of Chinese inputs in ASEAN exports.

Figure 3.11: ASEAN's Forward Participation by Partner
(% of gross exports)



Note: ASEAN = Association of Southeast Asian Nations, AU = Australia, CN = China, EU = European Union, IN = India, JP = Japan, KR = Republic of Korea, rhs= right-hand side, UK = United Kingdom, US = United States.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

India–ASEAN GVC Integration is Crucial for Participating in Japan's Manufacturing Industries

From a manufacturing perspective, intra-ASEAN investments in manufacturing are the highest amongst all investors. With the growing importance of the ASEAN Economic Community's first pillar – single market and production base – manufacturing attracted the largest share of intra-ASEAN FDI, at around 33%, followed by real estate and financial and insurance activities. On the other hand, top FDI flows from outside ASEAN (the US) primarily went to financial and insurance; professional, scientific, and technical; and manufacturing activities. Similarly, FDI flows from the EU were largely directed towards financial and insurance, wholesale and retail, and manufacturing activities. Meanwhile, Chinese investors significantly invested in manufacturing, wholesale and retail, and real estate activities. These trends highlight the diverse priorities and economic interests of investors from different regions, shaping the economic dynamics within ASEAN. In 2023, the financial and insurance industry was the primary recipient of inward FDI flows in ASEAN, attracting US$91.9 billion, which constituted 40.0% of the total inward FDI, followed by manufacturing (22.0%) and professional, scientific, and technical activities (9.0%) (ASEAN, 2024). Zeroing in on investments in manufacturing, Japan is a leading investor in the manufacturing industries in ASEAN. The presence of Japanese manufacturing firms in ASEAN is large. According to data from the ASEAN–Japan Center in Tokyo, in 2023, there were 15,887 Japanese firms in ASEAN, of which about two-thirds

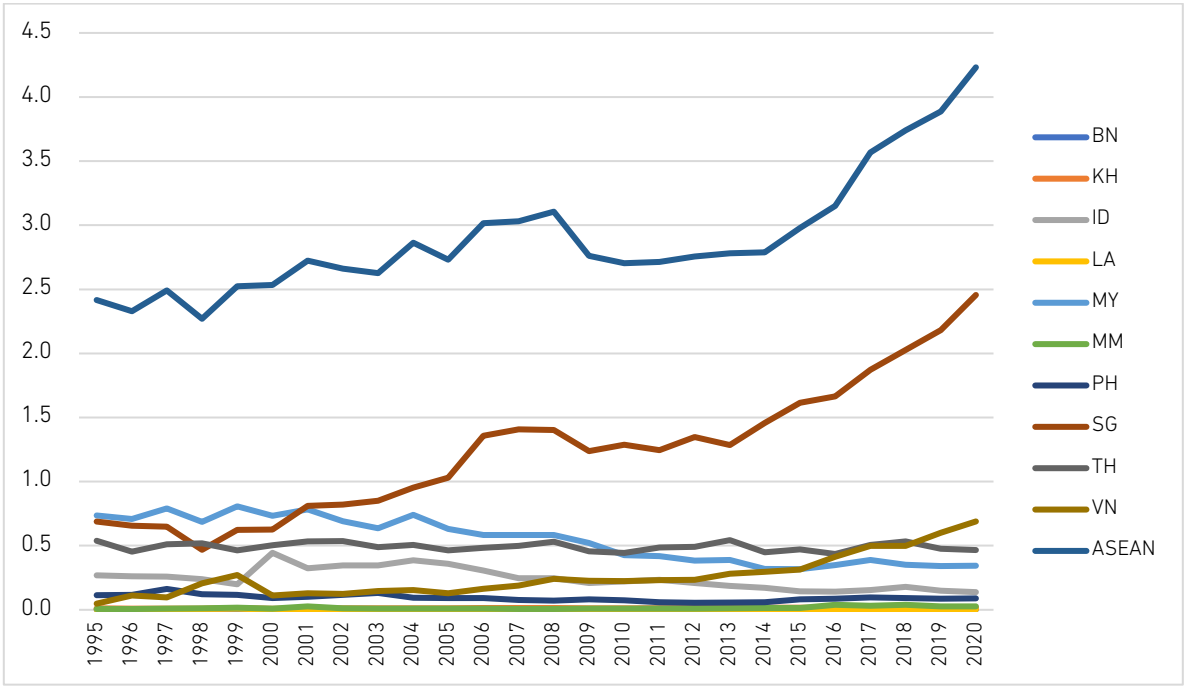
were manufacturing firms. As such, India's GVC integration with manufacturing firms in ASEAN is significant both for India–ASEAN trade and investment and India–Japan supply chain linkages.

From 2010 to 2020, India's GVC integration with ASEAN increased the most – by 1.3% of its gross exports – followed by 0.3% with China and the EU. Thanks to ASEAN's FDI to India, the progress in ASEAN–India GVC integration is dominated by India adding more value to ASEAN's exports, or India's forward participation with ASEAN.

As the FDI between ASEAN and India is also growing, it should contribute to enhancing supply chain linkages between the two partners. The increased FDI should be reflected in manufacturing, rather than services, as is mostly the case now.

In 2020, India ranked higher in GVCs than ASEAN, meaning that India exported more value added to the world. Investment from ASEAN has helped India move up in GVCs to surpass ASEAN. The rise of India–ASEAN GVC integration has been predominantly driven by forward integration with Singapore and to a lesser extent Viet Nam (Figure 3.12).

Figure 3.12: India's Forward Participation with ASEAN Member States
(% of gross exports)

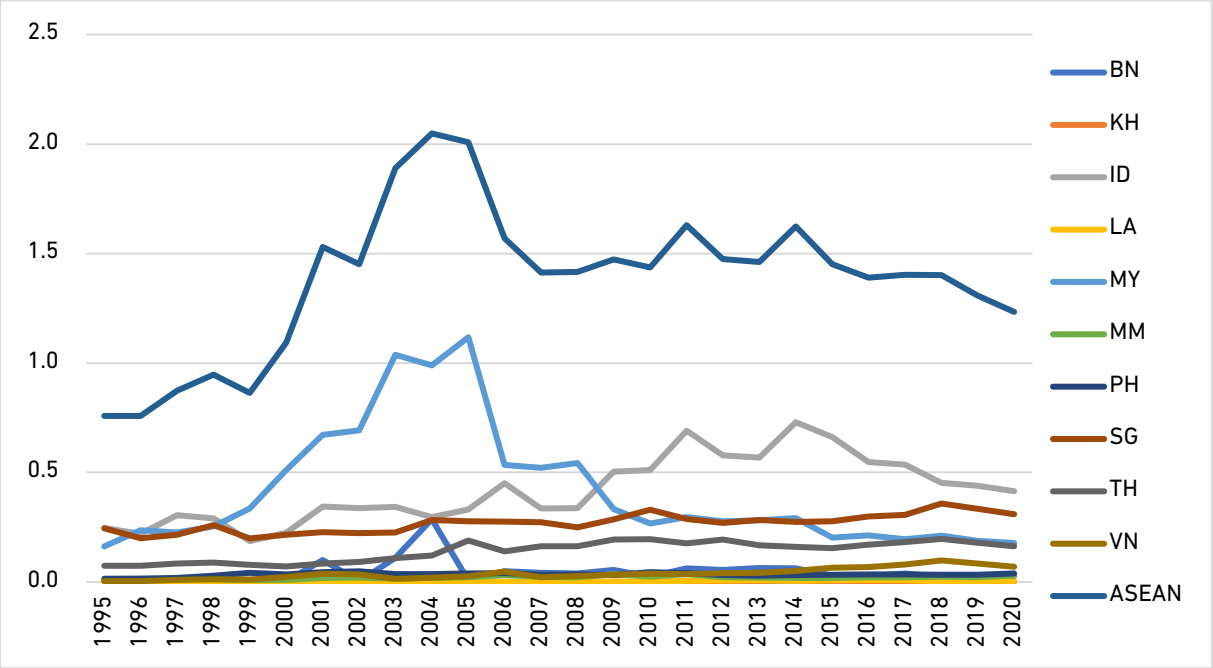


ASEAN = Association of Southeast Asian Nations, BN = Brunei Darussalam, ID = Indonesia, KH = Cambodia, LA = Lao People's Democratic Republic, MM = Myanmar, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, VN = Viet Nam.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

Meanwhile, India's backward participation with ASEAN has dropped significantly since 2006 when the country cut its imports of crude oil from Malaysia. India's backward

participation seems to be decreasing with Indonesia too, as India seeks to diversify its imports of raw materials. Backward participation with other AMS remains stable (Figure 3.13).

Figure 3.13: India's Backward Participation with ASEAN Member States
(% of gross exports)

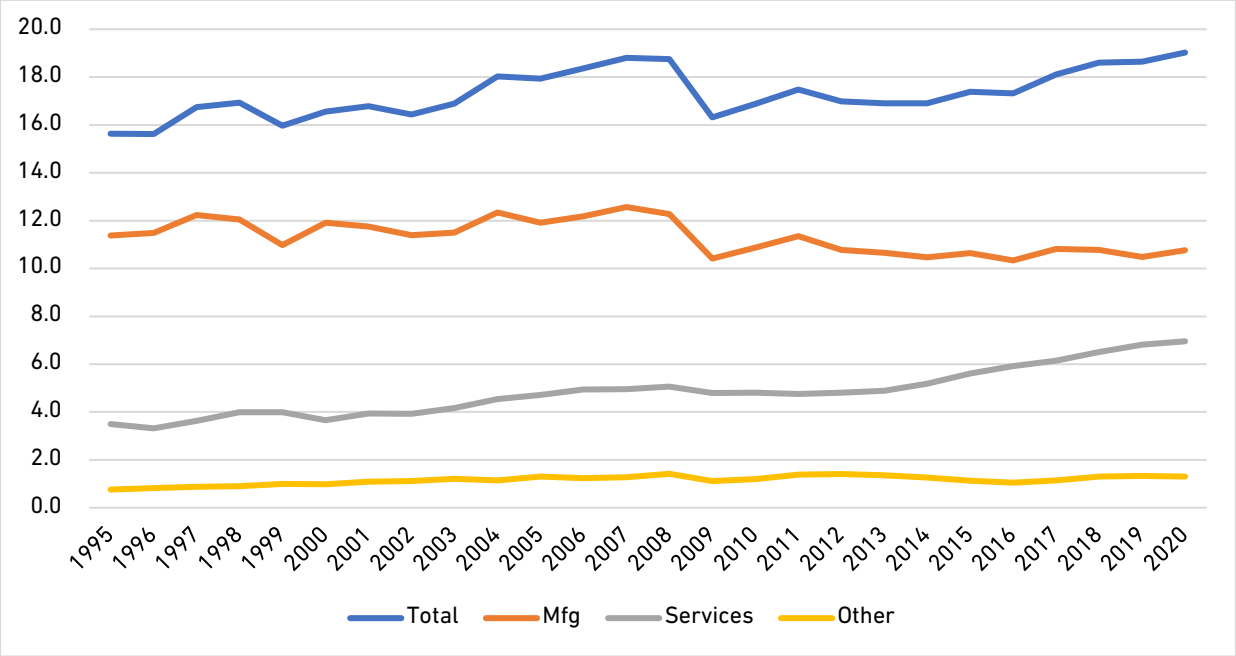


ASEAN = Association of Southeast Asian Nations, BN = Brunei Darussalam, ID = Indonesia, KH = Cambodia, LA = Lao People's Democratic Republic, MM = Myanmar, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, VN = Viet Nam.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

Sectoral Performance in India–ASEAN GVC Participation

Prior to 2008, India's forward GVC participation was on a steady rise, showing a gain of 3.2 percentage points since 1995, with the manufacturing sectors contributing 1.2% and services 1.6%. After the global financial crisis, India's rise in global manufacturing value chains stagnated due to stalled FDI inflows, but the service sectors continued to perform well, especially since 2014, mainly in the ICT sector (Figure 3.14).

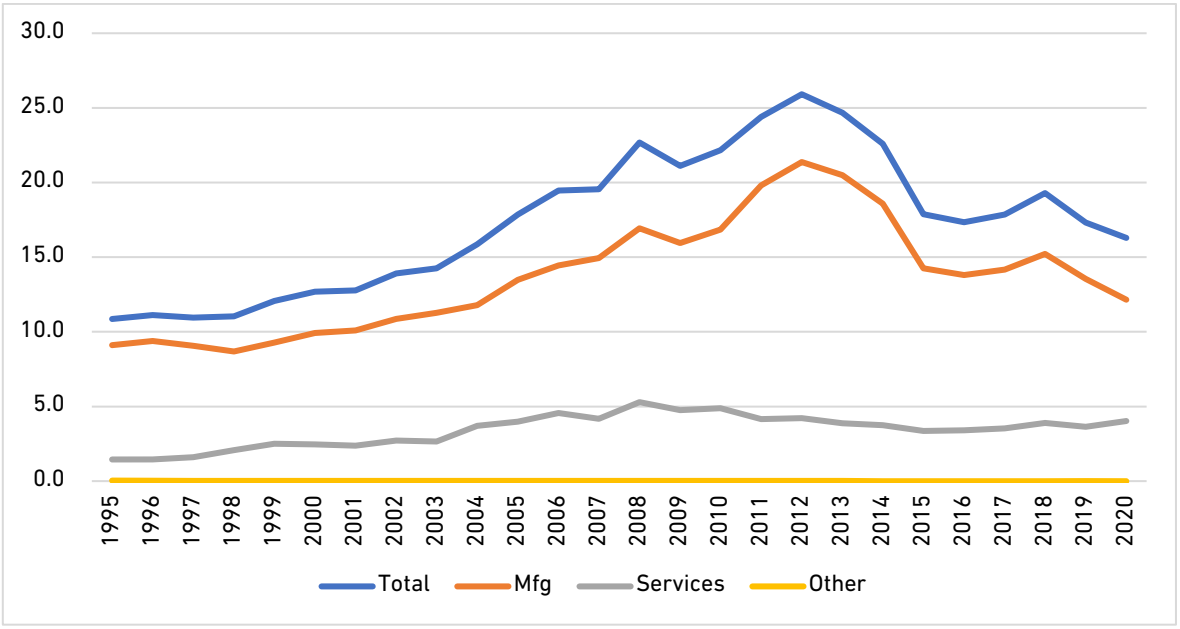
Figure 3.14: India's Forward Participation by Sector
(% of gross exports)



Mfg. = manufacturing.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 4 July 2024).

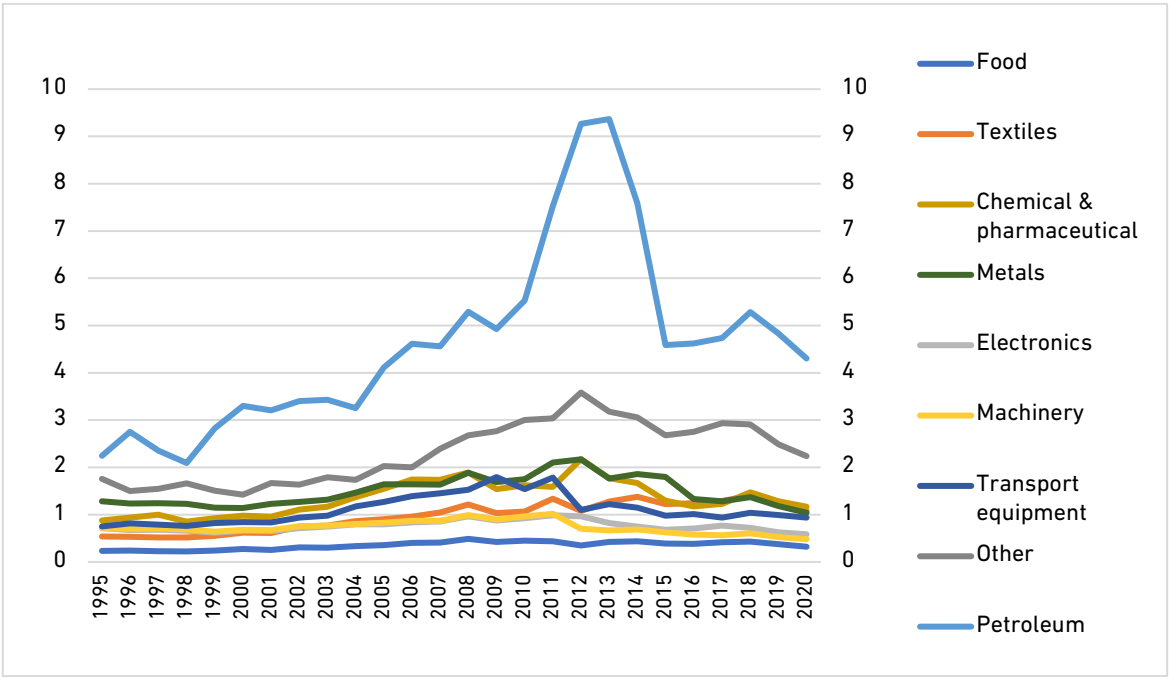
On the other hand, India has seen a major decline in backward participation in the manufacturing sectors, which was discussed in the previous section, while services have also helped but to a lesser extent (Figure 3.15). India's backward participation peaked in 2012 as it rapidly integrated into GVCs, but this trend then reversed as India's domestic supply chains started to replace part of the foreign value added for GVCs. The progress of domestic inputs is quite notable in a few industries, such as petroleum refining, metals, chemicals, pharmaceuticals, and transport equipment (Figure 3.16).

Figure 3.15: India's Backward Participation by Sector
(% of gross exports)



Mfg. = manufacturing.
Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

Figure 3.16: India's Backward Participation of Manufacturing Industries
(% of gross exports)

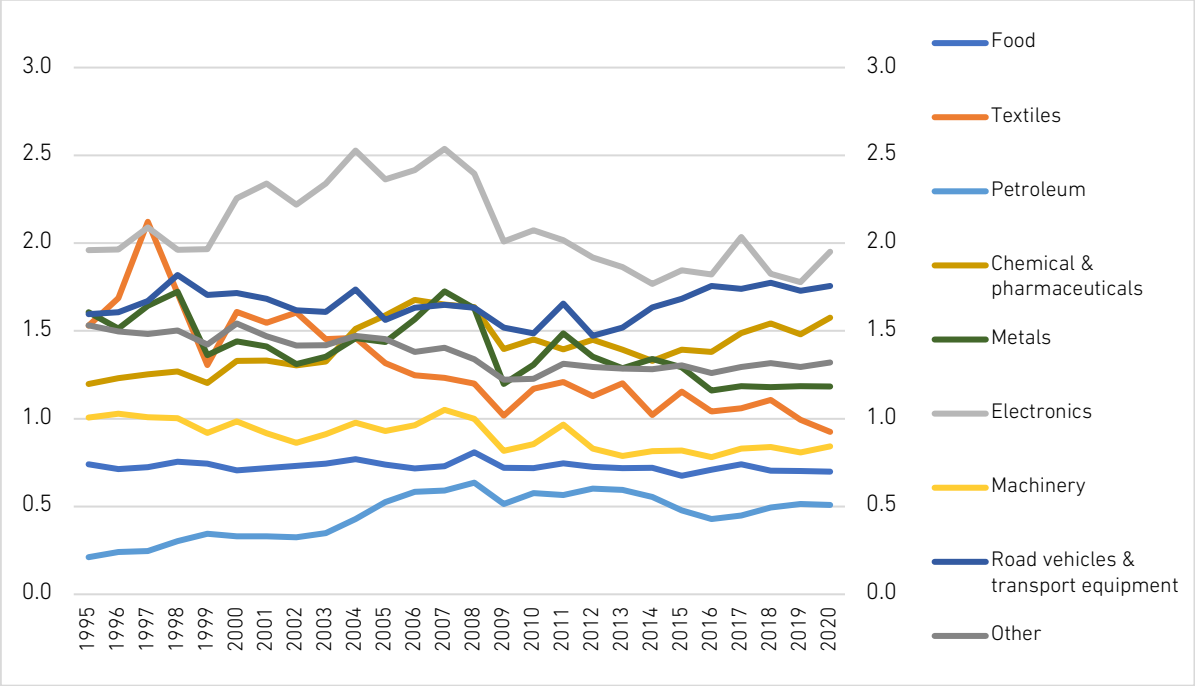


Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

However, the growth of India's forward GVC participation in the manufacturing sectors remains sluggish due to the low FDI, compared with ASEAN. The exported value added in most of India's manufacturing sectors is flat or down in recent years, except for transport equipment, chemicals, and pharmaceutical manufacturing (Figure 3.17).

Figure 3.17: India's Forward Participation of Manufacturing Industries

(% of gross exports)

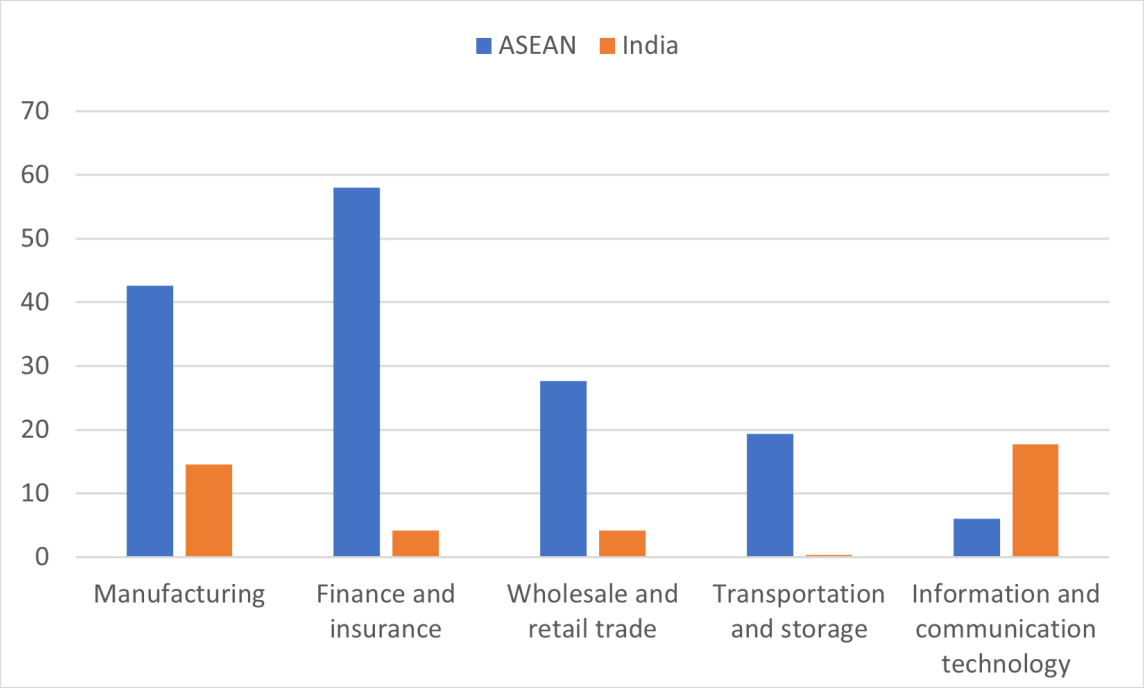


Source: OECD (2023), Trade in Value Added (TiVA) database. https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

FDI is the Key to Competitiveness

Although the FDI received by India has been on the rise for many manufacturing sectors (e.g. the automobile, pharmaceutical, renewables, and electrical and electronics sectors), the FDI values remain underwhelming (Figure 3.18) with most of the FDI going to the digital sector. As a comparison, ASEAN received FDI of $9.5 billion for its electronics industry in 2022, which is in stark contrast to India's $539 million (ASEAN and UNCTAD, 2023).

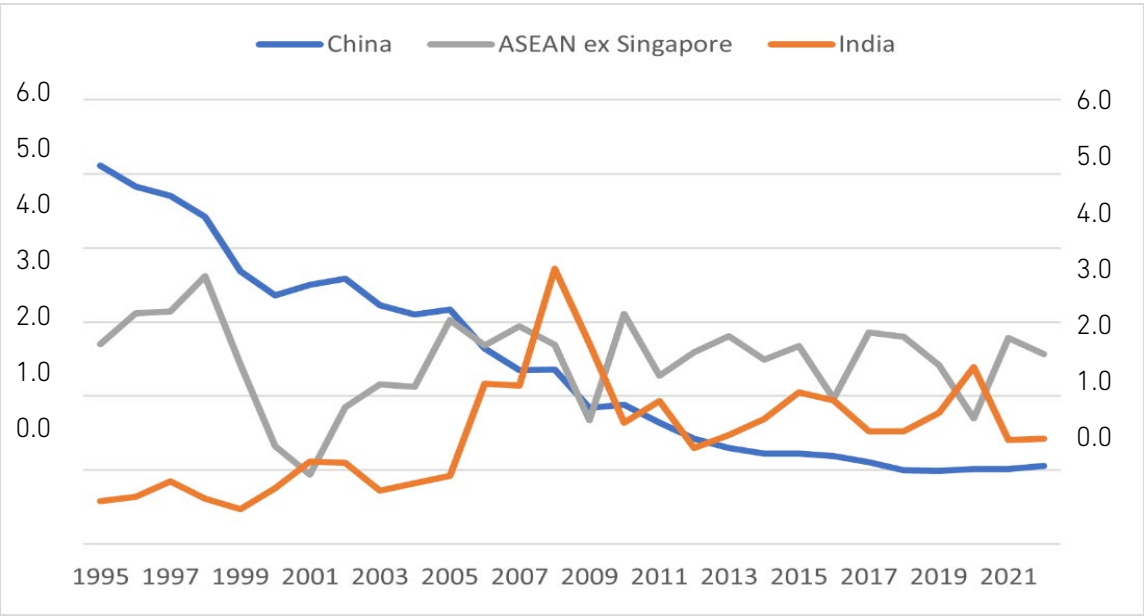
Figure 3.18: Foreign Direct Investment by Industry
(US$ billion, 2020–2022 average)



ASEAN = Association of Southeast Asian Nations.
Sources: ASEAN and UNCTAD (2023); and Department for Promotion of Industry and Internal Trade, India (2024).

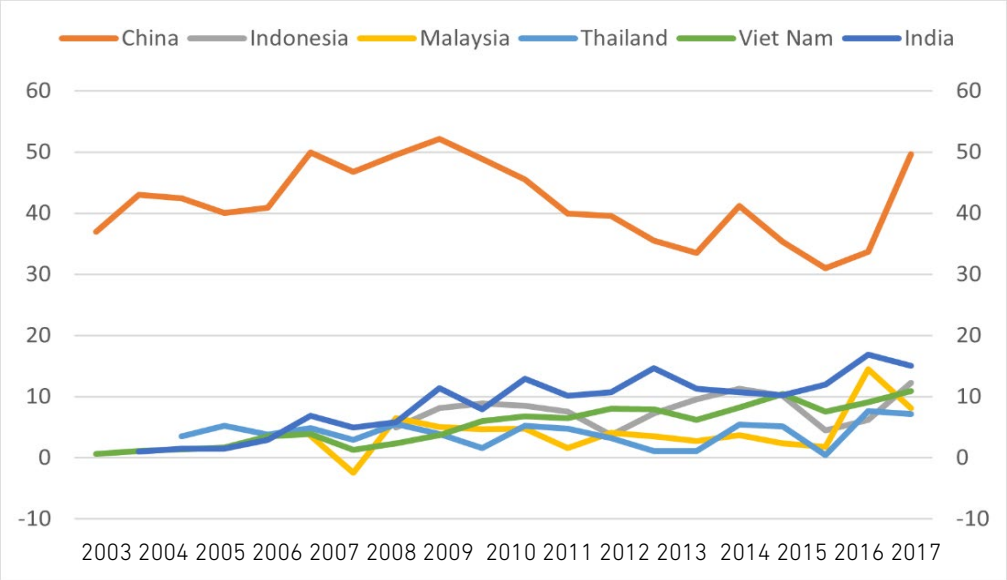
Although India receives higher inflows in absolute value compared with individual AMS, together AMS outnumber India by more than twice (Figures 3.19 and 3.20).

Figure 3.19: Foreign Direct Investment Inflows Comparison
(% of GDP)



ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product.
Source: UNCTAD (2023)
https://unctadstat.unctad.org/datacentre/dataviewer/US.FdiFlowsStock. (accessed 4 July 2024).

Figure 3.20: Manufacturing Foreign Direct Investment Inflows
(US$ billion)



Source: CEIC (n.d.), https://www.ceicdata.com/en (accessed 23 July 2024).

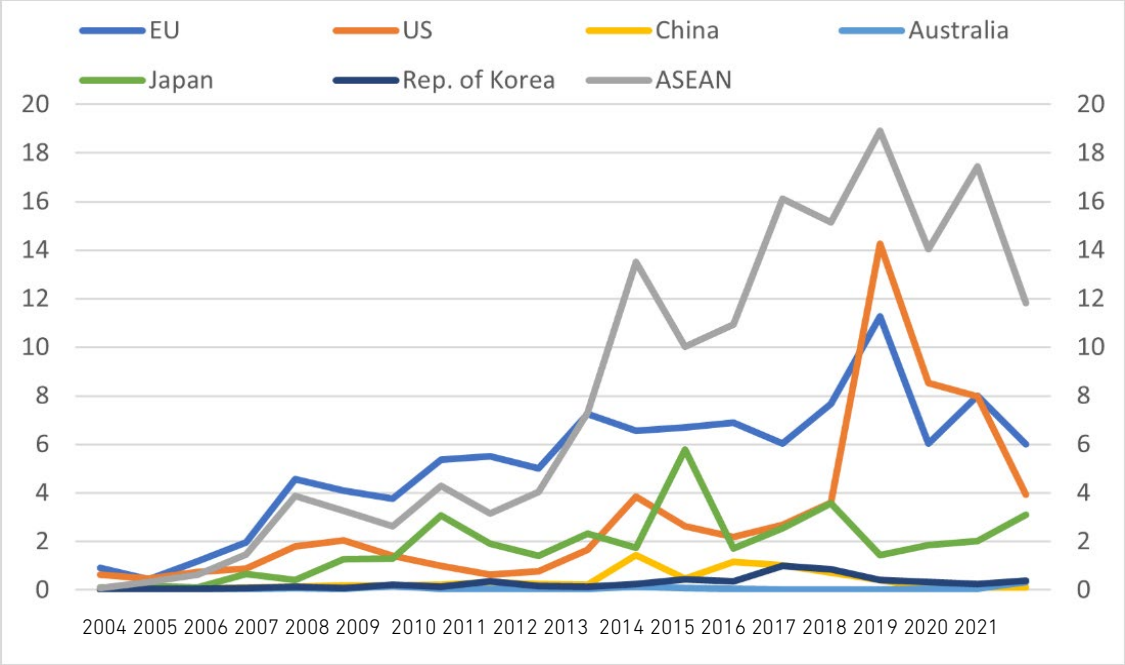
AMS have been receiving more FDI than India, especially from East Asian countries like China, Japan, and Korea (Table 3.1). In contrast, India's FDI mainly comes from ASEAN, the EU, and increasingly the US (Figure 3.21).

Table 3.1: ASEAN's Foreign Direct Investment Inflows by Source, 2022
(US$ million)

Country/Region	Value (million US$)	Share (%)
ASEAN	449,834.5	22.9
United States	290,964.5	14.8
China	290,766.5	14.8
EU 27	176,377.9	9.0
Japan	133,310.9	6.8
Hong Kong	114,689.7	5.8
Korea, Rep. of	80,883.2	4.1
India	70,619.0	3.6
Taiwan	58,836.4	3.0
Australia	51,989.0	2.6
Top 10 Country/Region	1,718.271.5	87.6
Others	243,864.6	12.4
Total	1,962,136	100

ASEAN = Association of Southeast Asian Nations, EU = European Union.
Note: Totals may not be exact due to rounding.
Source: ASEANstats (2023), Flows of Inward Foreign Direct Investment (FDI) into ASEAN by Source Country. https://data.aseanstats.org/fdi-by-hosts-and-sources (accessed 17 July 2024).

Figure 3.21: India's Foreign Direct Investment Inflows by Source
(US$ billion)



ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.
Source: Department for Promotion of Industry and Internal Trade, India (2024).

India's Growing GVC Participation: Creating Momentum for Japanese Investments in India

India has built considerable comparative advantage since 2009 and excelled in a few sectors. It currently ranks ninth for the whole manufacturing sector in terms of value added to GVCs and has an enviable seventh rank for services. The ninth rank for all industries is calculated after excluding intra-EU trade. Table 3.2 summarises the details by industry. India's manufacturing value added outweighs services, but increasing the share and global rank will require transforming the demographic advantage in manufacturing through professional training, investments, and scaling up high-skill manufacturing.

Table 3.2: India's Export Value Added

Industry	Value added (US$ million)	Share of global value added (%)	Rank
Total	**88,002**	**3.1**	**9**
Manufacturing (Total)	**47,233**	**2.4**	**11**
Food products, beverages, and tobacco	2,983	3.0	9
Textiles, wearing apparel, leather, and related products	3,977	4.1	8
Wood and paper products and printing	994	2.8	9
Coke and refined petroleum products	1,989	1.2	18
Chemical and chemical products	5,469	3.4	9
Pharmaceuticals, medicinal chemical, & botanical products	1,989	3.2	8
Rubber and plastics products	1,989	3.1	9
Other non-metallic mineral products	497	2.2	12
Basic metals	3,480	2.3	12
Fabricated metal products	1,492	2.6	11
Computer, electronic, and optical products	6,463	1.6	15
Electrical equipment	2,486	2.3	11
Machinery and equipment n.e.c.	3,977	2.8	12
Motor vehicles, trailers, and semi-trailers	5,966	2.7	9
Other transport equipment	1,492	2.2	14
Business Sector Services (Total)	**34,803**	**4.7**	**7**
Wholesale and retail trade; repair of motor vehicles	6,961	3.9	8
Transportation and storage	7,955	3.9	8
Accommodation and food service activities	497	3.6	9
Information and communication	9,944	7.0	6
Financial and insurance activities	4,475	4.3	8
Professional, scientific, and technical activities	2,983	4.8	7
Administrative and support services activities	1,492	4.3	7

Source: OECD (2023), Trade in Value Added (TiVA) database https://www.oecd.org/en/topics/sub-issues/trade-in-value-added.html (accessed 1–4 July 2024).

Table 3.2 brings a positive impetus for both Japan and ASEAN to increase their FDI in India. This could be accompanied by increased policy negotiations on tariffs and non-tariff measures that slow down India's competitiveness and attractiveness as an investment destination.

India has been growing, and re-accelerated in recent years in exporting car parts (Harmonised System (HS) code 87), machinery (HS code 84), electrical and electronic

parts and components (HS code 85), and transport equipment other than cars (HS code 88) since the early 2000s. It is important for India to gain traction in these products since they require higher production technology and thus carry higher value added compared with labour-intensive goods. During the rise of these industries in India, overseas demand from ASEAN helped significantly as India shipped as much as 25% of total orders for these products to ASEAN. This remarkable growth in exports of goods from HS code 84 to 90 has seen an overall drop in exports to ASEAN since 2014. The growth in exports to Japan has increased marginally year on year. The scope for an increase in investment in production and supply chains therefore remain immense.

Meanwhile, ICT services remain India's most valuable sector in service exports, and its contribution of 7% of global value added in ICT is only lower than that of China (11%) amongst all emerging markets. Transportation and storage, wholesale and retail trading, and financial and professional services are also gaining traction thanks to the push of an uptick in FDI inflows. Therefore, increased attention to the services component of trade will be important for the review of India–Japan investments.

Making India–Japan–ASEAN Supply Chains Fit for the Production of Goods of the Future

'Green and digital trade' is an emerging area of concern for all trading nations, as evidenced by the increasing inclusion of chapters and provisions dealing with these areas in free trade agreements, as well as their incorporation in work by the major multilateral agencies concerned with trade, e.g. through a concern with the links between trade and climate change, or the implications of digital transformation for trade and development.

Against this background, the role of green and digital trade in the India–Japan supply chains and investment is very important, making this partnership facilitate the supply chain linkages and increased trade in environmentally friendly products, as well as digital products that promote foreseeable structural changes in the regional and global economy. Producing green and digital goods and promoting critical mineral supply chains between India and Japan, with other partners such as ASEAN and Australia, which are important upstream and downstream contributors, must be embodied in the plans.

How does the India–Japan bilateral trade feature green and digital goods, and the supply chain of components for manufacturing such goods? What sorts of policy changes could facilitate future growth in trade? These questions will need to be addressed if the India–Japan supply chain and investment plan is made fit for future trade.

Identifying Select Goods to Establish ASEAN–India Trade in Goods of the Future

Green and digital goods are not a recognised part of any product or industry classification used in international settings. As countries and international organisations have come to recognise the importance of policy in these areas, they have developed ad hoc rosters of goods that fall into different categories relating to the overall green and digital classification, using existing HS code classification systems. Since countries are

frequently unable to agree on which goods should be included in particular classifications, we can select a few clusters of green and digital goods from the HS standard structure (at the 6-digit level) as these represent important parts of green and digital supply chains and are regarded as economically and strategically important for the manufacturing of green and digital products.

The first cluster is low-carbon technology goods, which are a key part of the global fight against climate change. Trade in low-carbon goods is particularly important because their development has been led by high-income countries, but there is an urgent need for diffusion to low- and middle-income countries in the context of the Paris Agreement and the global commitment to achieve net zero carbon dioxide emissions by 2050. Research by Pigato et al. (2020) identified a list of low-carbon technology products using the 2017 revision of the HS, and this list is maintained by the International Monetary Fund (IMF, 2017a).

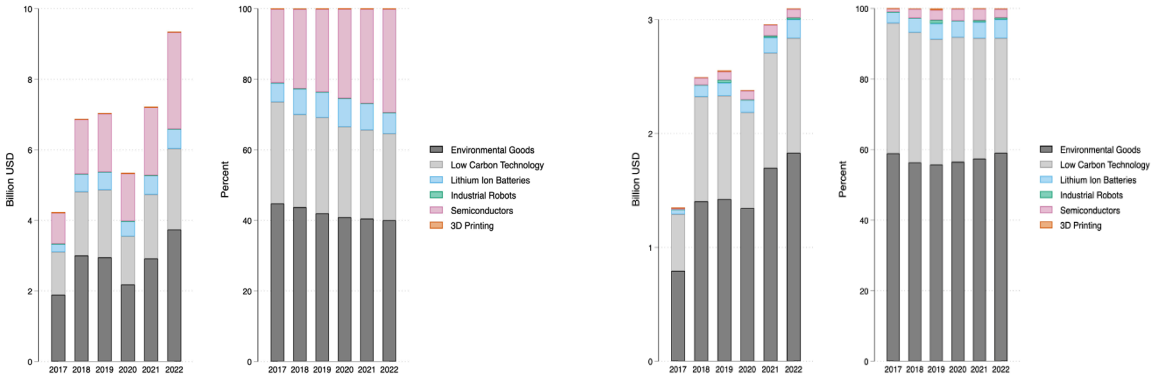
The second cluster is environmental goods. This group refers to products that have significant potential to improve environmental conditions in a variety of ways. The IMF has produced a list of environmental goods using the 2017 revision of the HS (IMF, 2017b).

The third cluster is the lithium-ion battery supply chain. The rationale for choosing this cluster is that lithium-ion batteries are crucial to many green applications, including electric vehicles and renewable energy storage. Based on research by McMahon (2022), which identified a list of goods from the 2017 revision of the HS that relate to this supply chain, the US Government adopted this list in full. This cluster is also important for the strategic partnership between ASEAN and India in the larger context of cooperation for resilient and diversified GVCs in the Indo-Pacific region.

Amongst digital goods, there is benefit in focusing on emerging and new technologies, as well as goods that are important for supply chains. Instead of analysing trade data for personal computers or smartphones, three aspects of digital trade that are of emerging importance and have been identified by countries as strategically important are analysed below: equipment used for 3D printing (HS 2017 code 847790), semiconductors (HS 2017 codes 8541 and 8542), and industrial robots (HS 2017 code 847950). Whereas the first three clusters of green goods required extensive combing of the HS to identify relevant products, these industrial products or digital goods are much better catalogued in the standard nomenclature and can be identified using a small number of product codes. All are important in emerging digital supply chains.

Figure 3.22: Exports of Selected Green and Digital Goods, 2017–2022
(US$ billion, % of total trade)

ASEAN to India | India to ASEAN



ASEAN = Association of Southeast Asian Nations.
Source: UN Comtrade, accessed via World Bank (n.d.), World Integrated Trade Solution. https://wits.worldbank.org/ (accessed 1 April 2024).

There are intensive inter-industry exchanges between India and ASEAN in the green and digital space, which is consistent with trade complementarities between the two, as evident from trade in semiconductors and lithium-ion batteries, which are important inputs into some environmental goods (Figure 3.22). ASEAN's exports to India in green and digital products have generally been increasing over time, reaching nearly US$10 billion in aggregate in 2022 from just over US$4 billion in 2017. Over time, ASEAN's exports are becoming more oriented towards semiconductors, and to some extent lithium-ion batteries; the role of environmental goods and low-carbon technology is not declining in absolute terms but is a smaller share of total ASEAN exports to India in green and digital products in 2022 relative to 2017. India's exports to ASEAN have surged too, albeit from a lower baseline than ASEAN, to over US$3 billion in 2022. India's exports have grown mainly in environmental goods and low-carbon technology, although lithium-ion batteries, and to a lesser extent semiconductors, have also seen growth. In the absence of distortionary policies, this pattern of trade would be consistent with different patterns of comparative advantage in the two regions, whether due to resource endowments or technology, or some combination of these and other micro-level factors. Two-way trade in similar but differentiated products is relatively limited in terms of the overall flows between ASEAN and India, which is reflective of distinct patterns of specialisation and broader economic factors in the bilateral trade relationship.

India has major investment needs in renewable energy and is developing the capacity to be an important player in that sector in the region and potentially beyond. India, Japan, and ASEAN must initiate more collaboration in this area, which has important synergies with the development of regional manufacturing capacity in lithium-ion batteries, electric vehicles, semiconductors, and other goods pertaining to the digital and green economy.

There is more policy activity in environmental goods than in semiconductors, which is perhaps partly a factor of the larger number of individual HS products involved. ASEAN maintains, in general but subject to exceptions, a relatively open trade regime for environmental goods and semiconductors, as was the conclusion from the analysis of tariffs. In India, the number of newly implemented policy measures for environmental goods is much higher than in ASEAN. Compared with ASEAN, the balance is far more towards restriction than liberalisation in India, which is using new tariffs and non-tariff measures to limit access to its market for environmental goods, usually with the objective of boosting reliance on domestic production.

India lags its more prolific and highly competitive neighbour ASEAN in the manufacturing sectors for two main reasons. The first is on the geostrategic front. In the rapid globalisation process which centred around China, ASEAN is better positioned than India given the cost advantage in transportation and raw materials. FDI from China, Japan, and Korea built up the manufacturing supply chains in ASEAN, especially in Malaysia and Viet Nam. Another factor lies in India's underdeveloped inland transportation and power infrastructure, which is key to manufacturing supply chains. However, India has prioritised the building of infrastructure in its landmark PM Gati Shakti National Master Plan, aiming for connectivity amongst all economic zones.

India is expected to continue its rise in the GVCs, with its promising demography and the global de-risking strategies regarding China. To use these opportunities, India will need to relax its tariffs and non-tariff measures further (to assess if the domestic producers of intermediate goods can still compete with producers outside India) and push forward more trade and investment deals to attract more FDI inflow to improve its domestic manufacturing industries.

ASEAN's huge dependency on Chinese inputs in ASEAN's exports has supported the competitiveness of its exports. However, the current turnaround in trade policies in large developed markets like the US and the EU, which favour diversified and resilient supply chains, and the emergence of new production centres in India, South Asia, West Asia, and Africa, may be a new opportunity for ASEAN to diversify its trade linkages. This may be especially important in the emergent digital and green economy, where the technology and supply chains of environmental and digital goods will be closely monitored by ASEAN's important trading partners.

For India, given its low backward participation, both with ASEAN and the rest of the world, it reduces India's dependence on the rest of the world and increases self-reliance while promoting domestic companies. But it increases the costs of intermediated goods into domestic products (as it is mostly a consequence of high tariffs on imports and other trade-related barriers to imports). For a sustainable future of manufacturing in India and for increased exports, import tariffs will need to be reduced to assess if the domestic producers of intermediate goods can still compete with producers outside India. This is the point where Japan's GVC integration with India will grow.

The key to deeper GVC integration and better quality of trade will lie in more bilateral FDI between India and Japan. Finding complementarities in manufacturing and the digital economy, including capacity enhancement, is the way forward for India and Japan to deepen their economic relations.

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Chapter 4

Japan's Industrial Cooperation with India and GVC Restructuring[1]

So Umezaki

Global value chains (GVCs) have been restructuring globally. In the period of the second unbundling since the latter half of the 1980s, GVCs were developed and expanded to take advantage of differences in factor endowments (Baldwin, 2006, 2011). For example, labour-intensive production processes were relocated from advanced economies to developing economies endowed with abundant labour. The rationale that drove the process was mainly 'efficiency'. The situation has been changing since the trade conflicts between the United States (US) and China triggered by the first Trump administration. To mitigate the negative impacts of the conflicts, private companies were effectively urged to reduce their dependence on China with support from their respective governments. This process, known as decoupling or de-risking, has been accelerated globally by rising geopolitical risks related to Russia's invasion of Ukraine in February 2022. Under such circumstances, GVC restructuring has been ongoing – driven by resiliency instead of efficiency.

In general, the deeper a country is integrated into GVCs, the more vulnerable it is to external shocks. Different from contingent shocks such as natural disasters or pandemics, the recent rise in geopolitical risks is largely recognised as a kind of structural shock for which we cannot expect a return to normal in a short period. This is why many countries have aggressively employed industrial policies with the objective of enhancing resiliency instead of competitiveness. Such a new wave of industrial policy has been studied both intensively and extensively (OECD, 2019; Juhász, Lane, and Rodrik, 2024; Goldberg et al., 2024). Most countries have implemented industrial policies to enhance resiliency by reducing dependency through reshoring, friend-shoring, developing new technologies, and so on. Focusing on the semiconductor sector, the recent wave of industrial policy was

[1] The views expressed in this article are solely those of the author. Any mistake or issue in the article is the responsibility of the author alone.

triggered by China when it established the China Integrated Circuit Industry Investment Fund, known as 'the Big Fund', in 2014 as its strategic effort to achieve self-sufficiency in semiconductor production and reduce reliance on foreign technology.[2] After fierce trade conflicts with China, the US enacted the CHIPS and Science Act in 2022 to bolster domestic manufacturing and research and development (R&D) in the semiconductor industry using subsidies and tax exemptions, and even restricting investment in countries of concern, i.e. China (Miller, 2022). The European Union enacted the European Chips Act on 21 September 2023 to strengthen the semiconductor ecosystem in Europe through fiscal support and various incentive and facilitation measures (Shivakumar, Wessner, and Howell, 2024).

Section 1 of this article will discuss how Japan has introduced an industrial policy aiming to enhance GVC resiliency, focusing on the semiconductor industry. Section 2 summarises the recent trend of the bilateral economic relationship between Japan and India, including industrial cooperation related to the two countries.

1. Japan's Industrial Policy for GVC Restructuring

The formation and restructuring of GVCs are in principle the results of the business activities of private companies. There used to be little room for governments to intervene in the process, except making and implementing rules. But the situation has been changing rapidly. The progress of globalisation has deepened economic interdependence between countries. External shocks far beyond the control of private companies, such as natural disasters, wars, and conflicts, or even economic confrontations between other countries, can cause devastating impacts on any country connected to GVCs.

1.1. Revisiting Economic Security

Against rising geopolitical risks in the last decade, Japan has started to re-emphasise economic security. Oil shocks in the 1970s, together with the influential report from the Club of Rome, were the first major opportunity for Japan to realise the finiteness of natural resources. Since then, as a country with little endowment of natural resources, Japan has invested a lot to develop energy-efficient and energy-saving technologies. A historically

[2] The Big Fund was established in 2014 with registered capital of CNY138.7 billion. The second phase followed in 2019 with CNY204 billion, and the third phase in May 2024 with CNY344 billion. See, for example, *Reuters* (2024).

poor rice harvest in 1993 due to cold weather reminded Japan of the importance of food security. The Great East Japan Earthquake in 2011 had a huge impact on the Japanese economy. Supply chain disruptions urged Japanese firms to pay more attention to risks in their supply chain management by diversifying sources of inputs, markets, and trade routes. The Fukushima Daiichi Nuclear Power Plant incident drastically changed Japan's energy policy. These events have repeatedly caused major structural changes in Japan. The recent rise in geopolitical risks is regarded as a major external shock requiring Japan to embark on further structural changes to review the balance between efficiency and risk in GVCs.

As the first step, the ruling Liberal Democratic Party released 'Recommendations Toward Developing Japan's "Economic Security Strategy"' on 16 December 2020, which identified 16 priority issues : (i) securing resources and energy, (ii) ocean development, (iii) reinforcing food security, (iv) developing financial infrastructure, (v) developing telecommunications infrastructure, (vi) space development, (vii) reinforcing cybersecurity, (viii) promoting the utilisation of real-world data, (ix) diversifying and strengthening supply chains, (x) achieving and maintaining Japan's technological excellence, (xi) enhancing innovative capacity, (xii) land transactions, (xiii) countermeasures to major infectious diseases, (xiv) infrastructure exports, (xv) involvement in rule-making via international organisations, and (xvi) improving economic intelligence capabilities. Reflecting the complexity of economic security, the recommendations are comprehensive, consisting of a wide range of policy issues. Most of them, those underlined above in particular, urged the Japanese government to implement policies related to GVC restructuring to achieve the goal of economic security. In addition, two key concepts highlighted in the recommendations help elucidate how Japan designed GVC restructuring policies to enhance economic security. The first is 'strategic autonomy', meaning that Japan should avoid excessive dependence on other countries under all circumstances. The second is 'strategic indispensability', which urges Japan to strategically increase the number of sectors where Japan is indispensable to the international community. In short, GVC restructuring in this context is the adjustment to optimise the balance of interdependence in the global economy.

1.2. Legislating Economic Security

Prime Minister Kishida held the first meeting of the Council for the Promotion of Economic

Security on 11 November 2021, which marked the initial step towards the legislation of a series of bills related to economic security. As a result, the Economic Security Promotion Act (Act on the Promotion of Ensuring National Security Through Integrated Implementation of Economic Measures; Act No. 43 of 18 May 2022) was enacted on 11 May 2022 and promulgated on 18 May 2022. On 1 August 2022, when part of the act entered into force, the Economic Security Promotion Office was established in the Cabinet Office and the Prime Minister Fumio Kishida appointed Takayuki Kobayashi as the first Minister of State for Economic Security.[3]

The act sets a basic policy to ensure economic security through integrated implementation of economic measures by establishing four-pillar systems aimed at (i) ensuring a stable supply of critical products, (ii) ensuring stable provision of essential infrastructure services, (iii) enhancing the development of specified critical technologies, and (iv) non-disclosure of selected patent applications (Cabinet Office, n.d.). Amongst them, the first system to ensure a stable supply of critical products is regarded as the main objective of Japan's policy for GVC restructuring. We will focus on this system below.

To implement the policy, the Enforcement Order of the Economic Security Promotion Act (Cabinet Order No. 394 of 2022) was promulgated and enforced on 23 December 2022. Article 1 of the order designated 11 specified critical products (SCPs): (i) antibacterial preparations; (ii) fertilisers; (iii) permanent magnets; (iv) machine tools and industrial robots, (v) aircraft parts for engines and bodies; (vi) semiconductor elements and integrated circuits; (vii) rechargeable batteries; (viii) computer programmes for cloud services; (ix) flammable natural gas; (x) critical minerals; and (xi) ship parts (engines, navigation tools, and thrusters). In the third amendment of the order on 2 February 2024, advanced electronic parts (condensers and filters) added a 12th SCP (Cabinet Order No. 25 of 2024) (Table 4.1).

[3] Takayuki Kobayashi is a member of the House of Representatives and belongs to the Liberal Democratic Party. His term ended shortly afterwards on 10 August 2022, when Prime Minister Kishida reshuffled the Cabinet and appointed Sanae Takaichi to take over the position.

Table 4.1: Specified Critical Products

	Specified Critical Products	Ministry and Agency in Charge		HS Codes
1	Antibacterial preparations	MHLW	NIBIOHN	300310, 3000320, 300410, 300420
2	Fertilisers	MAFF	FERI	3101, 3102, 3103, 3104, 3105
3	Permanent magnets	METI	NEDO	850511, 850519
4	Machine tools and industrial robots	METI	NEDO	847950, 8456, 8457, 8458, 8459, 8460, 8461
5	Aircraft parts for engines and bodies	METI	NEDO	8803, 840710, 840910
6	Semiconductor elements and integrated circ	METI	NEDO	3818, 8486, 8541, 8542, 903082, 903141
7	Rechargeable batteries	METI	NEDO	8507
8	Computer programmes for cloud services	METI	NEDO	N.A.
9	Flammable natural gas	ANRE	JOGMEC	271111, 271119
10	Critical minerals	METI	JOGMEC	2504, 2602, 2604, 2605, 2610, 2611, 2613, 2614, 2615, 2804, 2805, 2809, 2846, 3801, 3910, 7110, 8101, 8102, 8103, 8104, 8105, 8106, 8108, 8109, 8110, 8111, 8112, 280130
11	Ship parts (engines, navigation tools, and thr	MLIT	JSTRA	840721, 840729, 840810, 840991, 840999
12	Advanced electronic parts (condensers and f	METI	NEDO	8532, 852910

MHLW	= Ministry of Health, Labour and Welfare
MAFF	= Ministry of Agriculture, Forestory, and Fisheries
METI	= Ministry of Economy, Trade and Industry
ANRE	= Agency for Natural Resources and Energy
MLIT	= Ministry of Land, Infrastructure, Transport and Tourism
NIBIOHN	= National Institutes of Biomedical Innovation, Health and Nutrition
FERI	= Fertilizer Economic Research Institute
NEDO	= New Energy and Industrial Technology Development Organization
JOGMEC	= Japan Organization for Metals and Energy Security
JSTRA	= Japan Ship Technology Research Association

Note:

MHLW	= Ministry of Health, Labour and Welfare
MAFF	= Ministry of Agriculture, Forestory, and Fisheries
METI	= Ministry of Economy, Trade and Industry
ANRE	= Agency for Natural Resources and Energy
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JOGMEC	= Japan Organization for Metals and Energy Security
JSTRA	= Japan Ship Technology Research Association

Source: Cabinet Office (n.d.), Name of webpage in Japanese [equivalent in English]. https://www.cao.go.jp/keizai_anzen_hosho/suishinhou/supply_chain/supply_chain.html. For HS codes refer to Morishige, Tanaka and Usami (2023).

Under this system, business entities aiming at ensuring a stable supply of SCPs or their materials may submit plans for (i) reinforcing production bases, (ii) diversifying supply sources, (iii) stockpiling, (iv) developing production technologies, and (v) developing alternative products, to the ministers in charge. Upon the approval of the ministers, the business entities may receive subsidies in the forms of direct grants to the approved

business entities or interest subsidies to financial institutions providing financing to the approved business entities, through the agencies in charge of supporting a stable supply of SCPs. Depending on the case, the approved business entities may also enjoy additional benefits based on special provisions of the Japan Finance Corporation Act (Act No. 57 of 2007), the Small and Medium-sized Enterprise Investment Business Corporation Act (Act No. 101 of 1963), and/or the Small and Medium-sized Enterprise Credit Insurance Act (Act No. 264 of 1950). If the above measures are not sufficient to ensure the stable supply of an SCP, the ministers in charge may designate it as an SCP for which special measures are necessary and take supplementary measures such as stockpiling.

1.3. The Revival of Industrial Policy

The Ministry of Economy, Trade and Industry (METI) disclosed Japan's strategy for semiconductors and the digital industry on 4 June 2021 to indicate future policy directions and specific strategies regarding the semiconductor industry and the digital industry, including the digital infrastructure. This strategy is a renewed manifestation of the Japanese government's initiative to revitalise the semiconductor industry after the failure of Elpida Memory.[4] The updated version of the strategy was announced by METI Minister Nishimura on 6 June 2023, reflecting the rapidly changing global trend, which requires enhanced efforts in the areas of economic security, digital transformation, green transformation, and generative artificial intelligence (AI).[5] The details of the strategy are as follows.

(1) Subsidy under the Specified Semiconductor Funding Programme

Based on the Act on Promotion of Development, Supply and Introduction of Specified Advanced Information and Communication Technology Utilisation Systems (enforced on 1 March 2022), business entities that plan to expand the domestic production capacity of

[4] Elpida Memory was established in 1999 by integrating the dynamic random-access memory (DRAM) business of NEC and Hitachi. After taking over Mitsubishi's DRAM business in 2003, Elpida ranked third in the sector. Despite massive support from the financial sector, including ¥30 billion in financing from the Development Bank of Japan, Elpida succumbed to international competition and applied for reorganization under the Corporate Reorganization Act in 2012 and was acquired by Micron Technology in 2013. It was renamed Micron Memory Japan in 2014 and is still in operation.

[5] Commerce and Information Policy Bureau, METI, 'Semiconductor and Digital Industry Strategy', June 2023 (in Japanese).

advanced semiconductors may receive subsidies upon the approval of the METI minister.

Since the introduction of this subsidy, six plans have been approved by the METI minister, including the epoch-making investment by the global giant, Taiwan Semiconductor Manufacturing Company (Table 4.2). Taiwan Semiconductor Manufacturing Company holds the majority share in Japan Advanced Semiconductor Manufacturing, Inc., and the remainder is held by Sony Semiconductor Solutions Corporation (less than 20%) and Denso Corporation (over 10%). The major products are logic semiconductors with 22/28nm and 12/16nm processes, which are regarded as the product range in high demand although they are not cutting-edge products.

Table 4.2: Approved Specified Semiconductor Manufacturing Facility Development Plans

Approved Business Entity	Date of Approval	Max Subsidy (¥ billion)	Place of investment	Major products	Production Capacity ('000/month, 12-inch equivalent)	Job creation	First Production
Japan Advanced Semiconductor Manufacturing (JASM) Taiwan Semiconductor Manufacturing Company (TSMC), Ltd.	17 Jun 2022	476.0	Kikuyo-cho, Kumamoto	Logic semiconductor (22/28nm, 12/16nm)	55	1,700	Dec 2024
Kioxia Corporation Flash Partners Limited Company (FPL) Flash Alliance Limited Company (FAL) Flash Forward G.K. (FFL)	26 July 2022 Revised on 6 February 2024	92.9	Yokkaichi, Mie	3D flash memory (6th and 8th generation)	105	7,300	Feb 2023
Micron Memory Japan, K.K. Micron Technology, Inc.	30 Sep 2022	46.5	Higashi-Hiroshima, Hiroshima	DRAM (1β generation)	105	3,900	Q1 2023
Micron Memory Japan, K.K. Micron Technology, Inc.	03 Oct 2023	167.0	Higashi-Hiroshima, Hiroshima	DRAM (1γ generation)	105	4,200	Q2 2026
Kioxia Corporation Kioxia Iwate Corporation Flash Partners Limited Company (FPL) Flash Alliance Limited Company (FAL) Flash Forward G.K. (FFL)	06 Feb 2024	150.0	Yokkaichi, Mie	3D flash memory (8th and 9th generation)	105	7,400	Sep 2025
			Kitagami, Iwate	3D flash memory (8th generation)	105	1,600	Sep 2025
Japan Advanced Semiconductor Manufacturing (JASM) Taiwan Semiconductor Manufacturing Company (TSMC), Ltd.	24 Feb 2024	732.0	Kumamoto	Logic Ssemiconductor (12nm/6nm)	105	1,700	Q4 2029

DRAM = dynamic random-access memory, K.K. = Kabushiki Kaisha (corporation), nm = nano meter, Q = quarter.
Source: METI (2024), Nintei Tokutei Handotai Seisan Shisetsu Seibi To Keikaku [Projects for Improvement of Certified Specified Semiconductor Production Facilities].
https://www.meti.go.jp/policy/mono_info_service/joho/laws/semiconductor/semiconductor_plan.html (accessed 11 December 2024).

(2) Subsidy based on the Economic Security Promotions Act

Based on Article 1 of the Economic Security Promotion Act, business entities that plan to invest to ensure a stable supply of semiconductors are, with the approval of the METI minister, eligible to receive government subsidies through the New Energy and Industrial Technology Development Organization (NEDO). The products and criteria for this subsidy are listed in Table 4.3. In addition to the product-wise criteria listed in the table, several common criteria require the approved business entities to (i) continue production for 10 years or more, (ii) respond to the market in the case of tight supply and demand, (iii) continue investment to maintain or strengthen supply capacity, (iv) contribute to the local economy and job creation, and (v) prevent the leakage of core technologies.

Since the introduction of this subsidy, 18 projects have been approved by the METI minister (Table 4.4). Amongst them, the joint application by Rohm and Toshiba Electronic Devices & Storage has the largest investment size (¥388.3 billion), aimed at enhancing the production capacities of silicon carbide (SiC) and silicon (Si) semiconductors and SiC wafers, followed by SUMCO Corporation, which plans to enhance the domestic production capacity of silicon wafers (¥225 billion).

Table 4.3: Products Eligible for the Subsidy and Product-Wise Criteria

Products eligible for subsidy	Criteria
A. Conventional Semiconductors	
(1) Power semiconductors	Ex. SiC power semiconductors Investing ¥200 billion or more Equipment and apparatus with cutting-edge technologies
(2) Microcontrollers (3) Analogue semiconductors	Investing ¥30 billion or more Difficult to achieve only through private sector efforts Using equipment and apparatus with cutting-edge
B. Semiconductor Manufacturing Machineries	
Semiconductor manufacturing machineries and parts and materials thereof	Investing ¥30 billion or more Difficult to achieve only through private sector efforts Using equipment and apparatus with cutting-edge technologies Additional conditions apply in the case of parts and materials
C. Parts and Materials for Semiconductors	
Materials used in the manufacturing process of finished semiconductor products and the parts and materials that make up the materials	Investing ¥30 billion or more Difficult to achieve only through private sector efforts Using equipment and apparatus with cutting-edge Additional conditions apply in the case of parts and materials
D. Raw Materials for Semiconductors	
(1) Yellow phosphorus and its derivatives (2) Helium (3) Rare gas (Neon, Krypton, Xenon) (4) Fluorite and its derivatives	Using equipment and apparatus with cutting-edge technologies

SiC = silicon carbide.
Source: METI (2024), Handotai no Antei Kyokyu no Kakuho ni Kakaru Torikumi no Nintei ni Tuite [Regarding the Approval of Plans to Secure Supply of Semiconductors]. https://www.meti.go.jp/policy/economy/economic_security/semicon/index.html (accessed 11 December 2024).

Table 4.4: Approved Plans for Securing Supply of SCPs

	Approved business entity	Approval date	Planned investment (¥ billion)	Maximum subsidy (¥ billion)	Criteria (Table 3.3)	Plan to
1	Renesas Electronics Corporation	28 Apr 2023	47.70	15.90	A(2)	Enhance domestic production capacity of MCU for automobiles and industrial IoT
2	Ibiden Co., Ltd.	28 Apr 2023	n.a.	40.50	C	Enhance domestic production capacity of advanced FC-BGA substrates
3	Canon Inc. Canon Semiconductor Equipment Inc.	16 Jun 2023	33.30	11.10	B	Enhance domestic production capacity of exposure apparatus for i-line and KrF
4	Resonac Corporation Resonac HD Yamagata	16 Jun 2023	30.90	10.30	C	Enhance domestic production capacity of SiC wafer
5	Sumitomo Electric Industries, Ltd.	16 Jun 2023	30.00	10.00	C	Enhance domestic production capacity of SicC wafer
6	Shinko Electric Industries Co., Ltd.	16 Jun 2023	53.30	17.80	C	Enhance domestic production capacity of next generation FC-BGA substrates
7	Kioxia Corporation Kioxia Iwate Corporation	16 Jun 2023	0.83	0.28	D(3)	Increase domestically-recycled amount of neon
8	Sony Semiconductor Manufacturing Corporation	16 Jun 2023	1.12	0.37	D(3)	Increase domestically-recycled amount of neon
9	Koatsu Gas Kogyo Co., Ltd.	16 Jun 2023	n.a.	0.07	D(2)	Collect helium gas from the gases emitted during semiconductor manufacturing process, and recycle
10	Sumitomo Corporation	16 Jun 2023	n.a.	5.20	D(1)	Develop recycling technology for yellow phosphorus, and start domestic production
11	SUMCO Corporation	14 Jul 2023	225.00	75.00	C	Enhance domestic production capacity of Si wafer
13	JFE Steel Corporation Tokyo Gas Chemicals Co., Ltd.	28 Jul 2023	n.a.	<18.87*	D(3)	Produce neon domestically
14	Taiyo Nippon Sanso Corporation	28 Jul 2023	n.a.	<18.87*	D(3)	Produce neon, krypton, and xenon domestically
15	Air Liquide Japan G.K.	28 Jul 2023	n.a.	<18.87*	D(3)	Produce neon domestically
16	Rasa Industries, Ltd.	28 Jul 2023	n.a.	0.16	D(1)	Develop recycling technology for high-purity yellow phosphorus, and stabilize supply thereof
17	Air Water Inc. Nippon Helium Inc.	06 Dec 2023	n.a.	0.92	D(2)	Stockpile helium
18	Rohm Co. Ltd. Lapis Semiconductor Co., Ltd. Toshiba Electronic Devices & Strage Corporation Kaga Toshiba Electronics Corporation	08 Dec 2023	388.30	129.40	A(1)	Enhance domestic production capacity of SiC power semiconductor, Si power semiconductor, and SiC wafer
19	Fuji Electric Co. Ltd. Denso Corporation	29 Nov 2024	211.60	70.50	A(1)	Enhance domestic production capacity of SiC power semiconductor, Si epitaxial wafer, and SiC wafer
20	Kanadevia Corporation	29 Nov 2024	2.70	0.90	B	Enhance domestic production capacity of lapping plate
21	C.I. Takiron Corporation Takiron Tech Co., Ltd.	29 Nov 2024	4.40	1.40	B	Enhance domestic production capacity of resin plate
22	Chemours-Mitsui Fluoroproducts Co.,Ltd.	29 Nov 2024	8.00	Jp to 1/3	B	Enhance domestic production capacity of resin
23	Toyo Gosei Co., Ltd.	29 Nov 2024	21.10	7.00	C	Enhance domestic production capacity of raw materials (photosensitive materials, polymers, and high purity solvents) for advanced photoresists
24	Mitsubishi Chemical Corporation	29 Nov 2024	3.70	Jp to 1/3	C	Enhance domestic production capacity of synthetic quartz powder

Note:
*) A part of the total amount of subsidy for rare gas (JPY 18.87).
FC-BGA = Flip Chip-Ball Grid Array, G.K. = Godo Kaisha (limited liability company), HD = hard disk, IoT = internet of things, MCU = microcontroller unit, n.a. = not available, Si = silicon, SiC = silicon carbide, C.I. = chemical industries.
Source: Author's compilation based on METI (2024), Nintei Kyokyu Kakuho Keikaku [Approved Plans for Securing Supply]. https://www.meti.go.jp/policy/economy/economic_security/semicon/index.html (accessed 11 December 2024).

1.4. Supporting Diversification of Overseas Supply Chains

Before the Economic Security Promotion Act, METI started a programme to support Japanese companies in enhancing the resiliency of their overseas supply chains through diversification, mainly in response to the supply chain disruptions caused by the coronavirus disease (COVID-19) pandemic. The programme was implemented primarily by the Association for Overseas Technical Cooperation and Sustainable Partnerships, and the Japan External Trade Organization (JETRO) supported the Association for Overseas Technical Cooperation and Sustainable Partnerships in administrating the application selection process. The programme includes subsidies for (i) introducing facilities, (ii) demonstration projects, and (iii) feasibility studies to diversify overseas supply chains. The industrial scope of the subsidy covers a wide range of the manufacturing industry, including semiconductors, automotives, medical equipment and devices, pharmaceuticals, construction machinery, and electronics and electrics. Following the first round from 26 May to 15 June 2020, a series of public calls was issued until the eighth round from 22 May to 23 June 2023. During the whole project, the total number of applications was 449, of which 124 (27.6%) were adopted (Table 4.5).

Table 4.5: Subsidy Programme for Diversifying Overseas Supply Chains

Round	Public call		Date	No. of applications	No. adopted	Ratio
	From	To				
1	26 May 2020	15 Jun 2020	17 Jul 2020	124	30	24.2%
2	03 Sep 2020	02 Oct 2020	05 Nov 2020	64	21	32.8%
3	30 Sep 2020	30 Oct 2020	02 Dec 2020	155	30	19.4%
4	26 Mar 2021	26 Apr 2021	29 Jun 2021	38	11	28.9%
5	31 Jan 2022	31 Mar 2022	07 Jun 2022	27	11	40.7%
6	29 Aug 2022	28 Oct 2022	27 Dec 2022	15	6	40.0%
7	13 Feb 2023	14 Apr 2023	30 Jun 2023	10	4	40.0%
8	22 May 2023	23 Jun 2023	18 Aug 2023	16	11	68.8%
			Total	449	124	27.6%

Source: Author's compilation based on JETRO (2023), Kaigai Sapurai Chein Tagenka To Shien Jigyo [Overseas Supply Chain Diversification Support Project]. https://www.jetro.go.jp/services/supplychain/ (accessed 11 December 2024).

2. Japan–India Economic Relationship

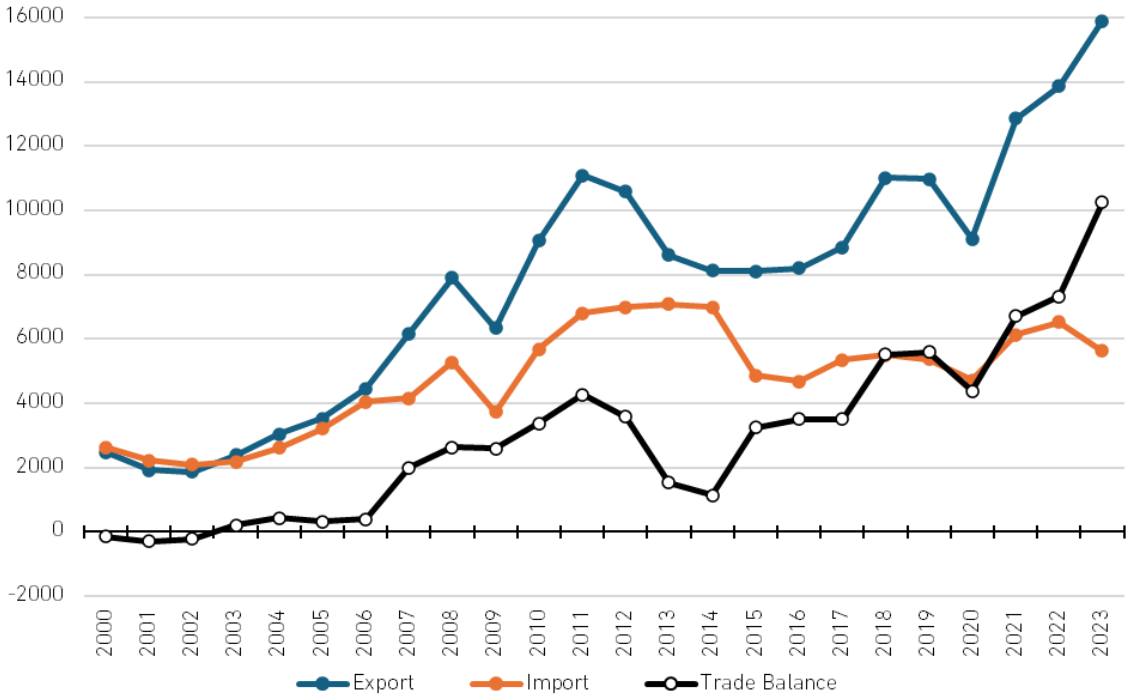
This section reviews the recent trend of Japan–India bilateral relationships in terms of economic cooperation, trade, and investment from the viewpoint of Japan.

2.1. Trade

Bilateral trade between Japan and India was stagnant and almost balanced in the early 2000s (Figure 4.1). Subsequently, both exports and imports started to increase, with an expanding trade surplus in favour of Japan. This trend is vivid in the last decade. Japan's imports from India have been stagnant since 2014, whereas Japan's exports to India grew rapidly from US$8,121 million in 2014 to US$15,894 million in 2023. As a result, Japan's trade surplus with India widened from US$1,132 million in 2014 to US$10,258 million in 2023. It is worth noting that the widening gap in bilateral trade has been observed under the Japan–India Comprehensive Economic Partnership Agreement (CEPA).

Table 4.6 illustrates the structure of Japan's exports to India in terms of Harmonised System (HS) 2-digit codes. Cumulative shares of the top 3, 5, and 10 items and the Herfindahl-Hirschman Index (HHI) indicate that the export structure was stable by 2010 but has diversified since then. In terms of traded goods, the share of HS 84 (machinery and mechanical appliances) has been the largest since 2000. HS 85 (electrical machinery and equipment), HS 87 (transport machinery), HS 72 (iron and steel), and HS 74 (copper and articles thereof) have been highly ranked. HS 29 (organic chemicals), HS 28 (inorganic chemicals), HS 39 (plastics), HS 40 (rubber), and HS 90 (optical products) are also important export items to India.

Figure 4.1: Japan's Trade with India (US$ million)



Source: Compiled by the author based on Global Trade Atlas (n.d.), https://www.spglobal.com/market-intelligence/en/solutions/products/maritime-global-trade-atlas (accessed 16 September 2024).

Table 4.6: Japan's Exports to India (2-digit HS codes)

Rank	2000 HS-2 Share	2005 HS-2 Share	2010 HS-2 Share	2015 HS-2 Share	2020 HS-2 Share	2023 HS-2 Share
1	84 31.7%	84 31.2%	84 30.6%	84 25.3%	84 21.9%	84 18.2%
2	85 12.8%	85 11.7%	85 13.6%	72 17.3%	85 10.9%	74 11.9%
3	87 10.2%	87 11.5%	72 12.2%	85 11.3%	74 10.1%	85 11.7%
4	72 6.1%	72 7.0%	87 8.2%	39 6.8%	39 8.9%	72 8.3%
5	29 5.9%	29 6.2%	90 5.2%	87 5.6%	28 7.7%	28 7.3%
6	90 4.9%	90 6.2%	0 4.0%	90 5.5%	72 6.7%	39 6.6%
7	82 3.3%	39 3.6%	29 3.9%	0 5.0%	29 5.1%	87 5.4%
8	37 3.1%	73 3.3%	73 3.9%	29 4.3%	90 4.9%	38 5.0%
9	40 2.9%	0 2.2%	39 3.3%	73 2.7%	87 3.8%	90 4.8%
10	73 2.8%	37 2.1%	40 2.7%	40 2.3%	0 2.9%	0 4.0%
Cumulative Shares of						
Top 3	54.7%	54.4%	56.4%	54.0%	42.8%	41.7%
Top 5	66.8%	67.6%	69.9%	66.4%	59.4%	57.4%
Top 10	83.8%	85.0%	87.6%	86.2%	82.9%	83.1%
HHI	1,426	1,417	1,441	1,246	977	892

HHI = Herfindahl-Hirschman Index, HS = Harmonised System.
Source: Compiled by the author based on Global Trade Atlas (n.d.), https://www.spglobal.com/market-intelligence/en/solutions/products/maritime-global-trade-atlas (accessed 16 September 2024).

Table 4.7: Japan's Imports from India (2-digit HS codes)

Rank	2000		2005		2010		2015		2020		2023	
	HS-2	Share	HS-2	Share	HS-2	Share	HS-2	Share	HS-2	Share	HS-2	Share
1	3	22.8%	27	16.8%	27	35.6%	27	26.3%	29	16.8%	29	17.2%
2	71	18.1%	26	16.7%	26	10.8%	29	11.6%	27	13.0%	71	9.1%
3	26	15.7%	71	16.7%	71	6.7%	3	7.7%	3	8.0%	87	7.3%
4	27	8.4%	3	8.6%	23	6.6%	71	7.2%	71	7.4%	84	6.9%
5	62	4.5%	29	4.9%	3	6.2%	84	4.3%	84	6.0%	3	6.8%
6	52	3.3%	62	3.7%	72	5.8%	72	4.0%	26	5.6%	76	6.6%
7	23	2.6%	23	3.5%	29	5.4%	62	4.0%	62	3.6%	85	6.0%
8	29	2.2%	84	2.5%	62	3.1%	87	2.7%	87	3.4%	72	3.7%
9	72	1.9%	52	2.4%	84	1.8%	26	2.7%	72	3.2%	62	3.1%
10	9	1.7%	72	2.3%	85	1.7%	85	2.1%	85	2.6%	30	2.4%
Cumulative shares of												
Top 3	56.6%		50.2%		53.0%		45.7%		37.9%		33.6%	
Top 5	69.5%		63.7%		65.8%		57.2%		51.3%		47.3%	
Top 10	82.9%		80.0%		84.9%		74.3%		71.9%		71.1%	
HHI	1,230		1,000		1,598		1,033		715		668	

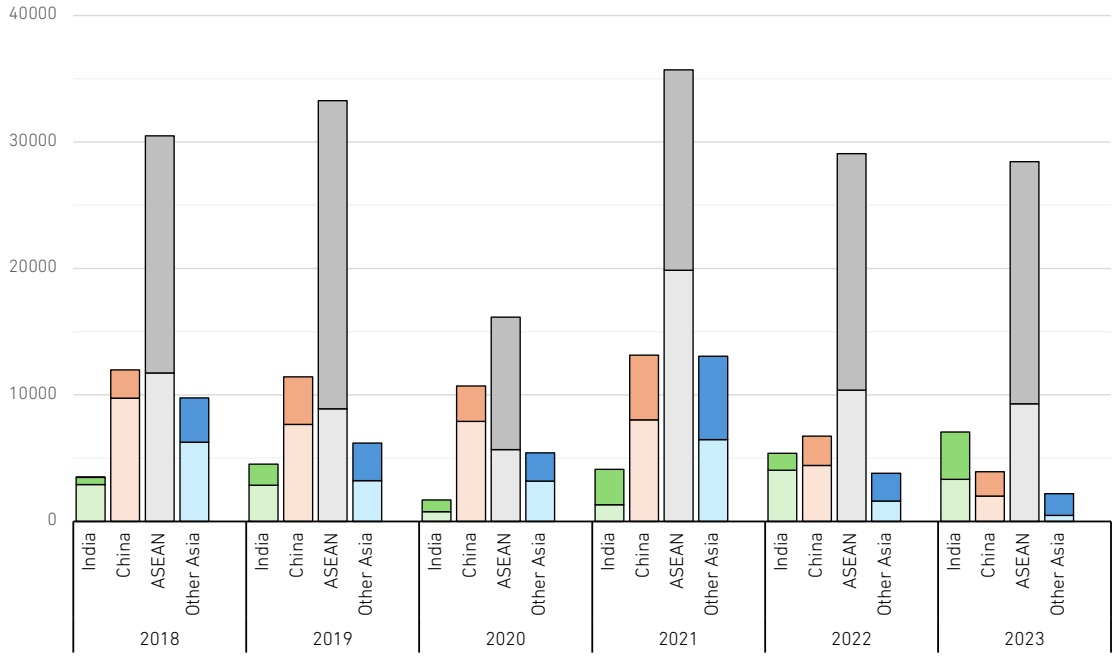
HHI = Herfindahl-Hirschman Index, HS = Harmonised System.
Source: Compiled by the author based on Global Trade Atlas (n.d.), https://www.spglobal.com/market-intelligence/en/solutions/products/maritime-global-trade-atlas (accessed 16 September 2024).

Similarly, Table 4.7 shows the structure of Japan's imports from India in terms of 2-digit HS codes. Again, the cumulative shares and HHI indicate that Japan's imports from India have diversified since 2010. Compared with exports, the structure of imports has shown more dynamic changes. For example, HS 27 (mineral fuels) was highly ranked until 2020, but the share decreased rapidly to 2.0% in 2023 (ranked 12th). Imports of HS 29 (organic chemicals) increased from US$59 million (1.7%, 8th) in 2000 to US$970 million (17.2%, 1st) in 2023. HS 71 (precious metals), HS 72, and HS 62 (apparel) are consistently ranked relatively high. Another important change is that Japan's imports of machinery products, HS 84, HS 85, and HS 87, has been increasing steadily and rapidly. The share of the three items expanded from 1.8% in 2000 to 4.2% in 2010, 9.1% in 2015, 12.0% in 2020, and 20.2% in 2023.

2.2. Investment

Japan's foreign direct investment (FDI) in India has been increasing since 2020 and marked a record high of ¥7,068 billion (about US$50 billion) in 2023, up 23.0% from the previous year – exceeding Japan's FDI to China, which has been decreasing after hitting a peak in 2021 (Figure 4.2). About half (47.2%) of Japan's FDI to India in 2023 is directed at the manufacturing sector, which includes Suzuki's acquisition of additional shares of its consolidated subsidiary, Maruti Suzuki India Limited, to raise its stake from 56.48% to 58.19%. This additional acquisition was done by transferring all the shares of Suzuki Motor Gujarat, a wholly owned subsidiary of Suzuki, to Maruti Suzuki, with the aim of improving business efficiency by consolidating its production system under Maruti Suzuki. In January 2024, Maruti Suzuki announced the establishment of a new factory in Gujarat, and Suzuki is making investments in India to start the production of India's first battery electric vehicle in 2024 (JETRO, 2024).

Figure 4.2: Japan's FDI to Asia (¥ billion)



ASEAN = Association of Southeast Asian Nations, FDI = foreign direct investment.
Notes: The light shading indicates FDI to the manufacturing sector, while the dark shading is FDI to non-manufacturing sectors. 'Other Asia' includes Hong Kong, the Republic of Korea, and Taiwan.
Source: Bank of Japan (n.d.), Direct Investment by Region and Industry and by Type of Investment, (2) Direct Investment Flows. https://www.boj.or.jp/en/statistics/br/bop_06/bpdata/index.htm (accessed 5 September 2024).

2.3. Deepening the Bilateral Relationship

Japan and India have strengthened their bilateral relationship since the beginning of the 21st century. During Prime Minister Yoshiro Mori's visit to India in August 2000, he and Prime Minister Atal Bihari Vajpayee established the Global Partnership between Japan and India, marking an important step towards strengthening the bilateral relationship. Since Prime Minister Junichiro Koizumi's official visit to India in 2005, Japan–India summit meetings have been held every other year in each country. In December 2006, during Prime Minister Manmohan Singh's visit to Japan, the bilateral relationship was elevated to the Global and Strategic Partnership.

At a summit meeting in Tokyo in September 2014, Prime Minister Narendra Modi and Prime Minister Shinzo Abe upgraded the bilateral relationship further to the Special Strategic and Global Partnership, aiming at deepening bilateral and regional cooperation (including security issues) and economic cooperation and improvement in investment climates to facilitate Japan's FDI to India.[6]

After the next summit meeting in Delhi in December 2015, they produced a joint statement titled 'Japan and India Vision 2025 Special Strategic and Global Partnership: Working Together for Peace and Prosperity of the Indo-Pacific Region and the World' as a guidepost for the new era in Japan–India relations – reiterating 'their unwavering commitment to realise a peaceful, open, equitable, stable and rule-based order in the Indo-Pacific region and beyond'.[7] The emphasis on the Indo-Pacific region led to Prime Minister Abe's epoch-making advocacy of the Free and Open Indo-Pacific in the keynote speech at the Sixth Tokyo International Conference on African Development (TICAD VI) in Kenya in August 2016, which claimed the importance of freedom of navigation, open trade routes, and respect for international law in the Indo-Pacific region. Since then, the Free and Open Indo-Pacific has been regarded as one of the most important cornerstones of Japanese diplomacy.

This led to the restart of the Quadrilateral Security Dialogue (Quad) in November 2017. At the Association of Southeast Asian Nations (ASEAN) Summit in Manila, the Leaders of Australia, India, Japan, and the US had a meeting for the first time in about 10 years and

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[6] 'Tokyo Declaration for Japan–India Special Strategic and Global Partnership', 1 September 2014, signed by Prime Minister Shinzo Abe and Prime Minister Narendra Modi.

[7] 'Japan and India Vision 2025 Special Strategic and Global Partnership: Working Together for Peace and Prosperity of the Indo-Pacific Region and the World', 12 December 2015, para. 4.

agreed to revive the Quad to counter China's expansion in the South China Sea, an important part of the Indo-Pacific region. Following a Foreign Ministers Meeting in September 2019, the first Quad Summit was held online on 12 March 2021. Since then, the Quad Summit Meeting has been held annually – on 24 September 2021 in Washington, DC, 24 May 2022 in Tokyo, 19 May 2023 in Hiroshima, and 21 September 2024 in Wilmington, DE. The next Summit Meeting will be held in New Delhi in 2025. Back to back with the series of Quad Summit Meetings, Japan and India have had bilateral summit meetings, deepening bilateral ties.

2.4. Economic Cooperation Involving Japan and India

(1) Economic Partnership Agreements

Japan and India agreed to establish a joint study group for a bilateral economic partnership agreement in November 2004. After four joint study group meetings between July 2005 and April 2006, both parties agreed to start negotiations in December 2006. It took 14 rounds of official talks to reach an agreement in principle in September 2010. As a result, the Japan–India CEPA was signed on 16 February 2011 and entered into force on 1 August 2011 to strengthen economic relations further between the two countries by liberalising and facilitating trade and investment, protecting intellectual property, harmonising competition policies, improving the business environment, and advancing bilateral cooperation in various areas.

The Regional Comprehensive Economic Partnership (RCEP) agreement was signed in November 2020 by the 10 ASEAN Member States, Japan, China, the Republic of Korea, Australia, and New Zealand, and entered into force on 1 January 2022 amongst the 10 Member States. The ratification process was completed on 2 June 2023, when it entered into force in the Philippines. Although India was one of the negotiating members of the RCEP, it withdrew from the RCEP negotiations at the Third RCEP Summit in November 2019.

(2) Bilateral Industrial Cooperation

One of the visible deliverables of the Special Strategic and Global Partnership established in 2014 was the Japan–India Investment Partnership, under which both parties agreed to develop Japan Industrial Townships (JITs) as integrated industrial parks so that Japanese

companies could smoothly establish production sites and operate their businesses – facilitating their investment in India and contributing to policies of India such as 'Make in India'. Since then, 12 JITs have been developed, and 110 Japanese companies are in operations, construction, land contracts, or contract negotiations in 9 JITs, generating at least ₹150 billion in investment and about 35,000 jobs (METI, 2024a).

The rapid progress of digital technologies in India led to the establishment of the Japan–India Start-up Initiative during METI Minister Hiroshige Seko's visit to India in May 2018. The scope of bilateral cooperation was expanded in the Japan–India Digital Partnership agreed during Prime Minister Modi's visit to Japan in October 2018 to include collaboration between private firms, human resources in the information technology (IT) sector, R&D in AI, and next-generation networks. Along this line of cooperation, the Japan–India Fund of Funds was established to mobilise financial resources for start-up businesses in India, aimed at enhancing collaboration amongst Indian companies, which are strong in software, and Japanese companies, which are strong in hardware.

In December 2019, the India–Japan Industrial Competitiveness Partnership (IJICP) was launched under an agreement between the METI Minister Hiroshi Kajiyama and the Minister of Commerce and Industry Piyush Goyal, as a secretary/vice minister-level framework. Under the IJICP, Japan and India have been working jointly to strengthen India's industrial competitiveness and promote bilateral industrial cooperation in areas such as logistics; sharing experiences and best practices on industrial policy; ease of doing business; export competitiveness; resolution of issues faced by Japanese companies operating in India; and issues in primary sectors such as healthcare, education, and agriculture through the use of digital technology.[8] In February 2023, the 5th IJICP secretary/vice minister-level meeting was held for the first time in Tokyo with about 80 delegates from both sides. The Sixth IJICP secretary/vice minister-level meeting was held on 28 June 2024 in Delhi, confirming the progress of sectoral working groups on agriculture, micro, small, and medium-sized enterprises, and the JITs (METI, 2024b).

Furthermore, to achieve the ¥5 trillion goal for public–private investment and loans to India in the 5 years to 2027, as agreed at the Japan–India summit meeting held in 2022, the two sides agreed to promote industrial cooperation, including human resources

[8] India–Japan Industrial Competitiveness Partnership Roadmap, signed on 19 March 2022.

development, and the improvement of the business environment in India to encourage Japan to invest in India.

The METI Minister Yasutoshi Nishimura announced the Initiative for Japan–India Industry Co-Creation during his speech at the Japan–India Deeptech Innovation and Clean Energy Seminar on 20 July 2023 in Delhi. Building upon existing bilateral cooperation frameworks, such as the Digital Partnership, CEPA, IJICP, and Clean Energy Partnership, the Initiative for Japan–India Industry Co-Creation aims to upgrade the bilateral economic relationship to the next stage by (i) creating future industries through innovation, (ii) evolving existing industries, and (iii) developing new markets. The memorandum of understanding on a Semiconductor Supply Chain Partnership signed by Minister Nishimura and the Minister for Electronics and Information Technology of India Ashwini Vaishnaw during the visit is an important part of the bilateral cooperation for the envisaged future industries, together with other cooperation in the areas of start-ups, digital technology, hydrogen and ammonia, and energy-related technologies. Cooperation on existing industries focuses on the steel industry in pursuit of economic growth and decarbonisation, the textile industry to improve quality, and small and medium-sized enterprises for capacity building and investment promotion. Initiatives for new market development include the promotion of Japanese export companies' investment in India, enhancing the export competitiveness of Indian industries, and the promotion of exports to third countries such as those in Africa.

Based on the Semiconductor Supply Chain Partnership, METI and the Ministry of Electronics and Information Technology co-organised the first policy dialogue on 10 November 2023. In addition to private companies in the semiconductor sector from both countries, related industrial associations and government agencies attended the dialogues to exchange views on improving the semiconductor industry's business environment.[9]

(3) Supply Chain Resilience Initiative

The Supply Chain Resilience Initiative is a trilateral collaboration between Australia, India, and Japan to strengthen supply chains in the Indo-Pacific region by reducing the

[9] The India Semiconductor Mission, India Electronics and Semiconductor Association, and India Cellular and Electronics Association from India; and the Japan Bank for International Cooperation and JETRO from Japan.

dependence on China. The initiative was launched in April 2021 in response to the COVID-19 pandemic, which exposed vulnerabilities in global supply chains and led to heavy debts for countries dependent on China.

The goals of the Supply Chain Resilience Initiative are (i) reducing China's dominance in the region, (ii) creating a sustainable supply chain, (iii) promoting best practices in national supply chain policy, (iv) fostering closer interconnectedness between businesses, (v) sharing best practices, (vi) promoting investment, and (vii) matching buyers and sellers for supply chain diversification.

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Chapter 5

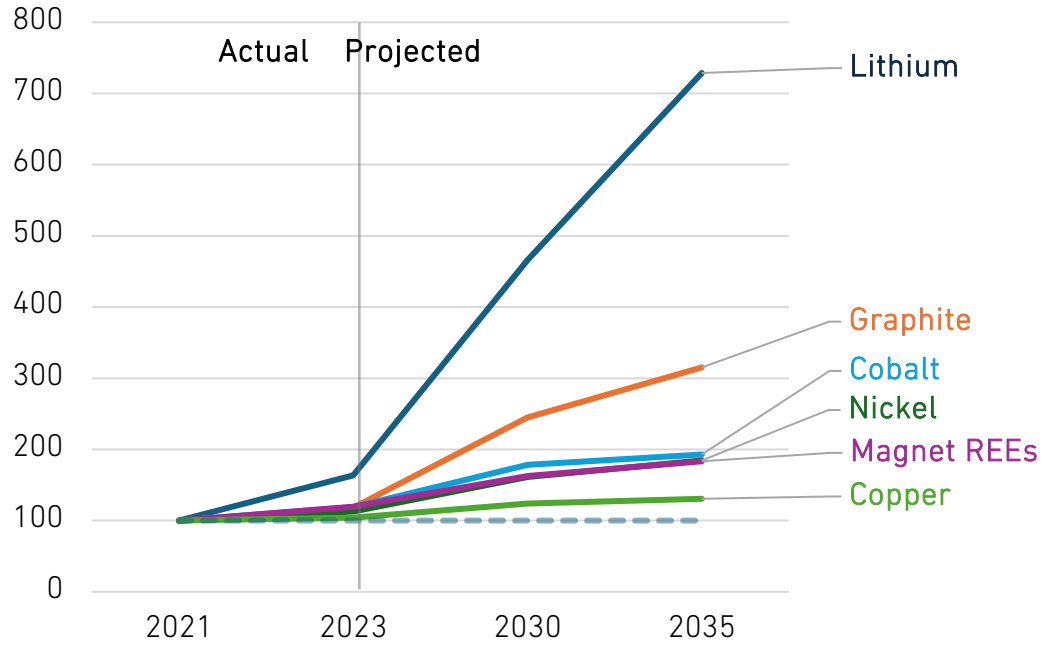
Resilient Critical Minerals Supply Chains: Opportunities for India, Japan, and Regional Partners

Shiro Armstrong

Introduction

Minerals like lithium, graphite, and nickel are widely expected to play an increasingly prominent role in global trade. Even under conservative projections, demand for these and other critical minerals will grow robustly, reflecting their importance for green technologies. Figure 5.1 shows projections of demand growth, in volume terms, to 2030 and 2035 under the Stated Policies Scenario of the International Energy Agency (IEA).

Figure 5.1: Volume of Demand, Energy Transition Minerals, Indexed to 2021 = 100



IEA = International Energy Agency, REE = rare earth element.
Note: 2030 and 2035 are projections based on the IEA Stated Policies Scenario. Magnet REEs are neodymium, praseodymium, dysprosium, and terbium.
Source: Based on IEA (2024a, 2024b) data.

A second category of critical minerals constitutes those with applications in semiconductor manufacturing. Since these minerals also tend to be used in solar

photovoltaic (PV) technology, they overlap with the energy transition minerals. Silicon is a key example, with global trade in high-purity forms reaching US$6.0 billion in 2022 (IEA, 2024a, 2024b; and US Geological Survey, 2024). Tantalum, used in capacitors, is another, with trade around US$1.3 billion in 2022.[1] Others like gallium and germanium, which have more niche high-end and military applications, are traded in smaller volumes but feature on Indian, Japanese, and Australian government critical minerals lists (Geoscience Australia, 2024).

Many of these markets face uncertainty as to whether supply will reliably meet the levels required to reach even modest emissions-reduction goals. Against this backdrop, domestic and international initiatives to safeguard critical minerals supplies have proliferated. Governments have employed a wide range of instruments, from regulatory policies to taxes and transfers to trade policies. In some cases, trade has been liberalised to facilitate critical minerals supply, such as India's recent exemption of 25 minerals from customs duties (Mishra, 2024). In other cases, trade has been restricted, including through local content requirements and export curbs.

A critical role for India, Japan, and their regional partners is to resist imposing unilateral barriers and instead invest in institutions that keep markets for these minerals open. If markets become mired in trade restrictions, then security of supply – and the diffusion of emissions-reducing technologies – will become, on average, slower, costlier, and more volatile. It is difficult to predict the supply, demand, and relative importance of critical minerals over long time horizons because they depend on technological change. An approach that encourages flexibility, preserves multilateral trade rules and norms, and uses industrial strategies judiciously will be most effective for securing supply into the future.

There are promising opportunities to improve the resilience of supply by encouraging deeper, more transparent international markets. Governments can also boost resilience by finding ways to create a more enabling environment for recycling. Since different countries have advantages in different parts of the value chain, there are international synergies. The good news is that India, Japan, and regional partners have a wealth of forums available that, if used wisely, allow them to coordinate policies and strengthen supply chain resilience.

The geographic distribution of production varies by mineral and is subject to change

A central question in assessing risk is whether production can expand quickly in the event of a shock. A market may appear relatively diversified geographically, but if barriers to entry are high, it may take some time to increase production in an emergency. Conversely,

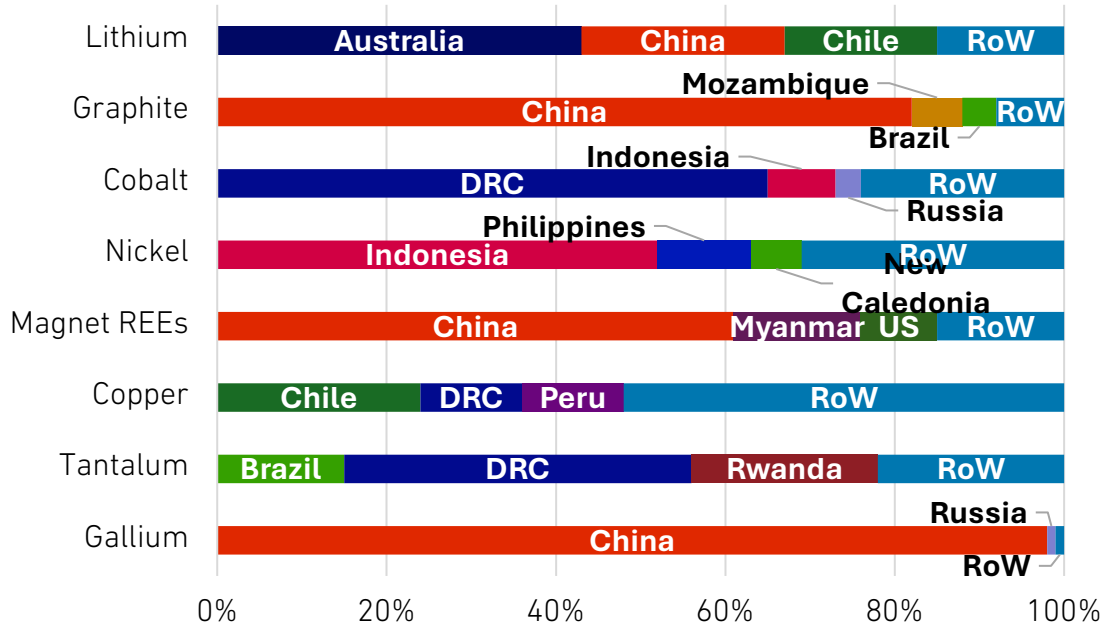
[1] Tantalum and silicon trade figures are from OEC (2024). 'High-purity' silicon refers here to at least 99.99% silicon (Harmonised System (HS) code 280461), but electronic and solar applications typically require an even higher percentage.

a market may appear highly concentrated, but if it is competitive and contestable, then the distribution of supply can more easily adapt to changing conditions.

In 2010, for example, China was reported to have restricted rare earth exports to Japan following a diplomatic dispute, thereby weaponising its dominance as a producer. Over the next few years, markets for raw rare earths became increasingly diverse and more reserves were found. Japan, like most Western countries, now sources a much smaller fraction of its supply from China compared with a decade ago. Reflecting on that episode, Evenett and Fritz (2023: 39) noted that the 'leverage of each supplier tends to decline as markets thicken'.

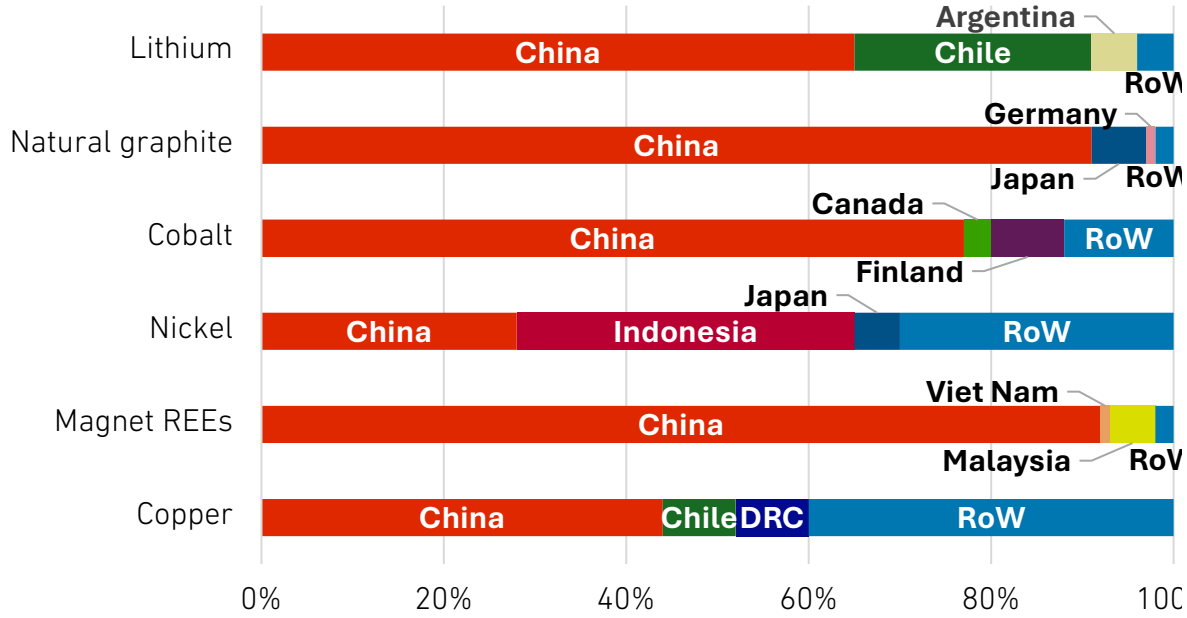
For copper, the most ubiquitous critical mineral, the issue that warrants greatest concern is not market concentration, but the risk that global supply will fall short of what is needed for the energy transition. Copper refining is more concentrated than mining – with China accounting for about 45% of refined output (Bloomberg, 2023) – but is diverse compared with other minerals (Figures 5.2 and 5.3). India and Japan have footholds in the supply chain. Japan is the third largest refiner by country of ownership and the fifth largest by location (IEA, 2024b: 115). India has substantial new refining capacity coming online, and the IEA expects its global refined copper market share to grow from 2.1% in 2023 to 3.5% in 2035 (IEA, 2024a).

Figure 5.2: Raw Minerals, Geographic Distribution of Output, 2023



DRC = Democratic Republic of the Congo, REE = rare earth elements, RoW = rest of the world, US = United States.
Source: Based on data from IEA (2024a, 2024b) and US Geological Survey (2024).

Figure 5.3: Refined Minerals, Geographic Distribution of Output, 2023



DRC = Democratic Republic of the Congo, REE = rare earth elements, RoW = rest of the world.
Source: Based on data from IEA (2024a, 2024b).

Products with highly concentrated production include refined magnet rare earth elements (REEs), gallium, and graphite. In addition to 80% of mined output, China produces 99% of spherical graphite, a precursor to graphite anodes used in batteries, and most synthetic graphite, which is the other (more emissions-intensive) option for graphite electric vehicle (EV) components. In the magnet REE sector, China produces about 92% of global refined output, with just four mines outside China and Myanmar operating at scale (IEA, 2024b: 172–173, 182).

The geographic concentration of refining output should be understood in relation to downstream production and consumption. For example, in 2023, China accounted for nearly 60% of new electric car registrations globally; the United States (US) represented about 10% (IEA, 2024c). China produced about 90% of the world's rare earth magnets in 2020 (US Department of Energy, 2022). Four of the world's top five wind power equipment manufacturers are in China, and in 2023, 97% of the turbines they installed were in their home market (Global Wind Energy Council, 2024).

While spherical graphite is the most concentrated part of the EV supply chain today, it is nonetheless diversifying. Assuming planned projects in North America and Europe come online, China's share in spherical graphite production is expected to fall to 85% by 2030 (IEA, 2024b: 173). India also has potential across the graphite value chain. It is a top five

natural graphite producer, with 3.1% of global reserves, and Indian companies have produced spherical graphite in trials.[2]

India has an estimated 6.3% of global REE reserves, including neodymium and praseodymium, and Japan has rare expertise in producing rare earth magnets. There are two types of these magnets, bonded and sintered, with the latter used in EV motors and wind turbines. As of 2023, outside China, only two plants in Japan manufacture sintered magnets at scale. There is great rare earth potential in Southeast Asia; Lynas established the world's first refining plant outside China in 2012 in Malaysia. The US Geological Survey estimated that Viet Nam has the world's second largest rare earth reserves.[3] Yet project lead times are around 8 years and, with Chinese supply having met global demand to date, there have been few recent announcements of new mining projects (IEA, 2024b).

Other minerals are somewhat less concentrated but face challenges with market responsiveness, with lithium as an example. Today, supply of lithium chemicals is relatively concentrated and, in the context of US–China strategic competition, exposed to geopolitical risk. There are plans for additional refining capacity in Australia, China, and the Republic of Korea (henceforth, Korea) (IEA, 2024a: 131). The diversity of the future geographic distribution depends significantly on which battery technologies are adopted most widely. Lithium reserves were discovered in India in 2023, which could present a significant new supply, though exploration is in its very early stages (Takkar, 2024).

Geopolitical and trade policy risks are disrupting all critical mineral markets

Geopolitical risks in the critical minerals sector will affect different markets in Asia and the Pacific in different ways, determined in large part by trade policies in the US, China, and other large economies. Markets for all EV inputs are likely to be significantly shaped by US policy, currently exemplified by the Inflation Reduction Act (IRA) of 2022. To qualify for US EV tax credits, a vehicle must have a minimum amount of its components sourced domestically or from free trade agreement partners (Table 5.1). These partners include Japan, which signed a critical minerals trade agreement with the US in 2023, but exclude India and most Association of Southeast Asian Nations (ASEAN) Member States.

[2] See Ramji, Shivani, and Das (2024); US Geological Survey (2024); and Wischer (2024).

[3] See US Geological Survey (2024) on estimated rare earths reserves globally; the Indian Department of Atomic Energy (2023) on the composition of India's reserves; and IEA (2024b: 185, 189) on Lynas and Japan's refining capacity.

Table 5.1: Content Requirements to Qualify for US Clean Vehicle Tax Credits

	Minimum percentage of value required to be sourced domestically or from FTA partners	
Year	Critical minerals	Battery components
2024	50%	60%
2025	60%	60%
2026	70%	70%
2027	80%	80%
2028	80%	90%
2029 and later	80%	100%

FTA = free trade agreement, US = United States.
Note: Qualifying vehicles must be assembled in the US.
Source: US Department of Energy (2024).

Requirements are looser for leased EVs, creating a loophole that has blunted much of the IRA's trade impact, but which has an uncertain future. EVs cannot qualify for US subsidies if they contain any battery components manufactured or assembled by a 'foreign entity of concern', including China.

Some analysts expect that a two-tier lithium price will arise, with a premium for IRA-compliant sources (Simionato, 2024). Similar dynamics may be emerging in graphite markets. In February 2024, Benchmark Mineral Intelligence, a leading source of price data, introduced a CIF North America graphite index.[4] It cites incentives like the IRA, which encourage sourcing from outside China, as a reason for the index, with traders seeking to 'ensure the price is reflective of dynamics in North America' (Benchmark, 2024). That said, regional price disparities also reflect non-policy factors like distance, and assigning causality to geopolitics to two-tier pricing is not straightforward.

In July 2023, China imposed export controls on gallium and germanium in retaliation to US CHIPS Act measures. These were followed by controls on natural graphite exports and, later in the year, separate export bans on technology to refine REEs and to produce rare earth magnets. The graphite measures are licencing requirements, rather than bans, but exports nonetheless plunged.[5] Given the increasingly zero-sum nature of technological competition, the expansion of export controls is a risk to the short-term supply of any mineral concentrated in few countries. India, Japan, and regional partners' best defence against trade policy risks is to support institutions that aim to keep this trade open.

[4] The index tracks graphite prices in North America inclusive of cost, insurance, and freight. It was initiated partly to provide information on graphite supply and demand outside China (Benchmark, 2024).

[5] See Home (2023) and Tabeta and Kawate (2023) on the context around the graphite measures, Liu and Patton (2023) on other rare earth controls, and Bloomberg (2024) for the subsequent drop in exports.

Indonesia's ban on exports of nickel ores and concentrates (starting in 2009 but with uneven implementation until around 2020) has precipitated major changes in global markets. Nickel laterite mining and refining has overtaken the traditionally mined sulphide, driven by newer, more emissions-intensive laterite refining technology pioneered by Chinese firms in Indonesia (Mandala, 2024). Indonesia now accounts for over half of global supply (IEA, 2024b: 142). A World Trade Organization (WTO) dispute regarding the bans was appealed into the void in December 2022, the panel having ruled against Indonesia (WTO, 2023).

There are several reasons why further export restrictions in critical minerals would create unfavourable conditions for India, Japan, and others in the region. Most immediately, they are costly for buyers and suppliers. Quantitative restrictions tend to attract costly rent-seeking behaviour from firms seeking allocations. Over longer periods, export restrictions generate policy uncertainty that discourages investment in new capacity. Most significantly, trade barriers spark retaliation. While curbs on the export of intermediates may assist local downstream producers, these benefits are likely to be eroded if other countries follow suit.

No country, even China, would benefit from critical minerals autarky. If markets become segmented along geopolitical lines, prices will be higher and, on average, supply will be less responsive to shocks. International cooperation is critical to ensure governments can balance national security concerns with the broadly open markets that underpin that security.

Greater market depth and recycling capacity would improve responsiveness to shocks

An important factor in the ability for critical minerals supply to expand in response to shocks is accurate and timely pricing. The impact is not just on mining but on investment and production decisions in midstream processing, refining, and recycling. Factors influencing price transparency include:

- the presence of markets at both spot and futures prices;
- whether trading is offered on major regulated exchanges; and
- the availability of data on costs, prices, capacities, and stockpiles (IEA, 2024b: 244–245).

Lithium prices have been highly volatile relative to other transition minerals, raising concerns about delayed or discouraged investments (IEA, 2024b). There have been calls for lithium futures contracts to increase price predictability, with some exchanges beginning to offer them (Jamasmie, 2021). In October 2023, the US Department of Defense announced plans for an artificial intelligence (AI)-based programme to estimate critical mineral prices and supplies, aimed at improving transparency (Scheyder, 2024).

Governments or industry bodies in producing countries could jointly explore regulatory means to improve global price transparency. Key regional partners in this area are China,

Australia, and Korea, as current and prospective lithium hydroxide producers, and Indonesia as a major nickel and cobalt supplier. Avenues for dialogue would include improving reporting on costs and quantities, and exploring the use of physically settled contracts (Epper, Handler, and M. Bazilian, 2024). Physically settled as opposed to cash-settled contracts provide more information about stocks because they are physically tied to the underlying commodity. Dialogue amongst industry, finance, and regulatory organisations could shed light on opportunities in this area.

Prices for rare earths and graphite are even less transparent than lithium, as they are not typically traded on traditional commodity exchanges. Information on supply is scarce – governments generally do not publish data on germanium production or reserves, for example (US Geological Survey, 2024). Researchers at the Federation of American Scientists have proposed government-backed auctions and even support for new commodity exchanges as ways to improve transparency (Wu, 2024).

Recycling capacity, like price transparency, increases the responsiveness of critical minerals supply to shocks. Recycling has outsize benefits for supply chain resilience, growing an extra branch in a supply network that can be leant on when primary supplies run short. The IEA estimated that further development of copper, lithium, nickel, and cobalt recycling could reduce the level of primary supply required by between 10–30% by 2040 (IEA, 2024b: 236).

Critical minerals recycling has been highlighted as an area for greater India–Japan cooperation. The India–Japan Clean Energy Partnership, signed in 2022, names recycling as a candidate for future collaboration (Indian Ministry of External Affairs, 2022). In August 2023, Japanese and ASEAN environmental ministers agreed to enhance cooperation on recycling, including on the development of e-waste disposal and collection regulations (Tanaka, 2023). Japan recycles more e-waste than any other Organisation for Economic Co-operation and Development (OECD) country, of which 40% is imported, having long considered recycling as a pillar of its critical minerals strategy.[6] Like copper refining, India also has potential to expand its role in global copper recycling (Raizada and Moerenhout, 2024).

India, Japan, and regional partners can gain from deeper critical minerals cooperation

India, Japan, and their regional partners have several avenues for cooperation to enhance the resilience of critical mineral supply chains. Multiple forums and mechanisms have been established for collaboration on critical minerals and related issues (Table 5.2). In addition to these forums, there are non-governmental initiatives. The Quad Investors Network, for example, is a non-governmental project to foster private investment in strategic sectors, launched alongside the May 2023 Quad Leaders' Summit. Mobilising private capital is a central objective of critical minerals cooperation – e.g., the IEA

[6] See Dewit et al. (2022) on India–Japan cooperation, Otaka (2024) on Japan's e-waste recycling, and Nakano (2021) on Japan's critical minerals strategy.

estimates that 70% of clean energy financing to meet announced pledges must come from the private sector (IEA, 2021).

Table 5.2: Relevant International Forums and Initiatives for India and Japan

Mode	Forum
Bilateral (including either country)	Australia–India Critical Minerals Partnership
	Australia–Japan Critical Minerals Partnership and Working Group
	India–Japan Clean Energy Partnership
	US–India Initiative on Critical and Emerging Technology
	US–Japan Agreement on Strengthening Critical Minerals Supply Chains
Plurilateral	Indo-Pacific Economic Framework for Prosperity
	Quadrilateral Security Dialogue
	Supply Chain Resilience Initiative (Australia, India, and Japan)
	OECD (Japan as member, India as key partner)
Multilateral	International Energy Agency (Japan as member, India as association country)
	Minerals Security Partnership
	World Trade Organization

OECD = Organisation for Economic Co-operation and Development, US = Untied States.
Sources: Indian Ministry of External Affairs (2022); Australian Department of Industry, Science and Resources (2023); Office of the United States Trade Representative (2023); and White House (2023).

To strengthen supply chain resilience, policymakers should use international agreements to favour measures that allow greater trade in critical minerals over those that impede it, such as export bans. Openness to foreign capital, with prudent regulations around areas of legitimate national security concern, is vital to ensuring competitive, diverse supply networks. For example, Australia's first facility for refining lithium hydroxide from hard rock – one of few such facilities outside China – was enabled by Chinese investment and know-how (Laurenceson, 2024).

In crafting national approaches, policymakers need to reckon with inherent uncertainties in critical minerals markets, both geopolitical and technological. Enhancing market functionality and adaptability, informed by ongoing public–private dialogue – rather than concentrating efforts in any single sector – is a useful guiding principle.

A productive agenda for India and Japan to boost critical minerals supply chain resilience could include the following.

Engage with industry to identify favourable regulatory settings for market transparency. This would include encouraging reporting on prices, costs, and stocks; facilitating the development of deeper financial markets for certain minerals; and creating

an enabling environment for recycling. One avenue for this engagement is the India–Japan Clean Energy Partnership, where policymakers could consider incorporating critical minerals into the partnership's four existing working groups (Indian Ministry of External Affairs, 2022). Another suitable forum is the US-led Minerals Security Partnership (MSP) which has previously convened meetings with private sector participants (US Department of State, 2024a).

Governments could also consider cooperating on geological mapping, which researchers have proposed as a potential Quad project (Dewit et al., 2022), building on an ongoing Australia–Canada–US initiative (IEA, 2022). By providing information on potential reserves and relevant geological phenomena, the mapping could contribute to international price transparency. There is also value in engaging with Chinese market participants and regulators, given their prominence and experience in key sectors. Initial engagement amongst academic and private sector experts could pave the way for governmental collaboration.

Continue to mobilise private investment and coordinate national policies through forums like the Quad. Governments can use these forums to signal joint interest and mobilise investment to address legitimate vulnerabilities. Coordination amongst countries can yield synergies, such as Japanese rare earth refiners benefiting from Indian mining operations. MINVEST, a US project to advance public–private dialogue and increase critical minerals investment, was launched in November 2023 and is open to other MSP parties joining (US Department of State, 2024b).

Encourage the free flow of skilled labour in midstream refining and processing. Some parts of critical minerals supply chains that are essential for everyday green technologies are dominated by a small number of firms – even a small number of facilities. While this concentration is broadly expected to ease over time, allowing mobility of skilled workers in these sectors would speed up this process. Highly specialised areas like the production of sintered rare earth magnets and lithium hydroxide would be ideal targets. Subsidising training programmes could further help disseminate expertise.

Support open trade in critical minerals and multilateral solutions to disputes. India, Japan, and regional partners can build on successes like the Australia–India Economic Cooperation and Trade Agreement to reduce critical minerals trade barriers. Commercial diplomacy can play a productive role, especially where informational barriers and regulatory complexity are high (Fry-McKibbin and Nguyen, 2019). Above all, a functioning multilateral trade system is the ultimate defence against fragmented, uncertain trade in these critical products. Japan's decision in March 2023 to join the Multi-Party Interim Appeal Arbitration Arrangement was an important step forward in this regard.

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