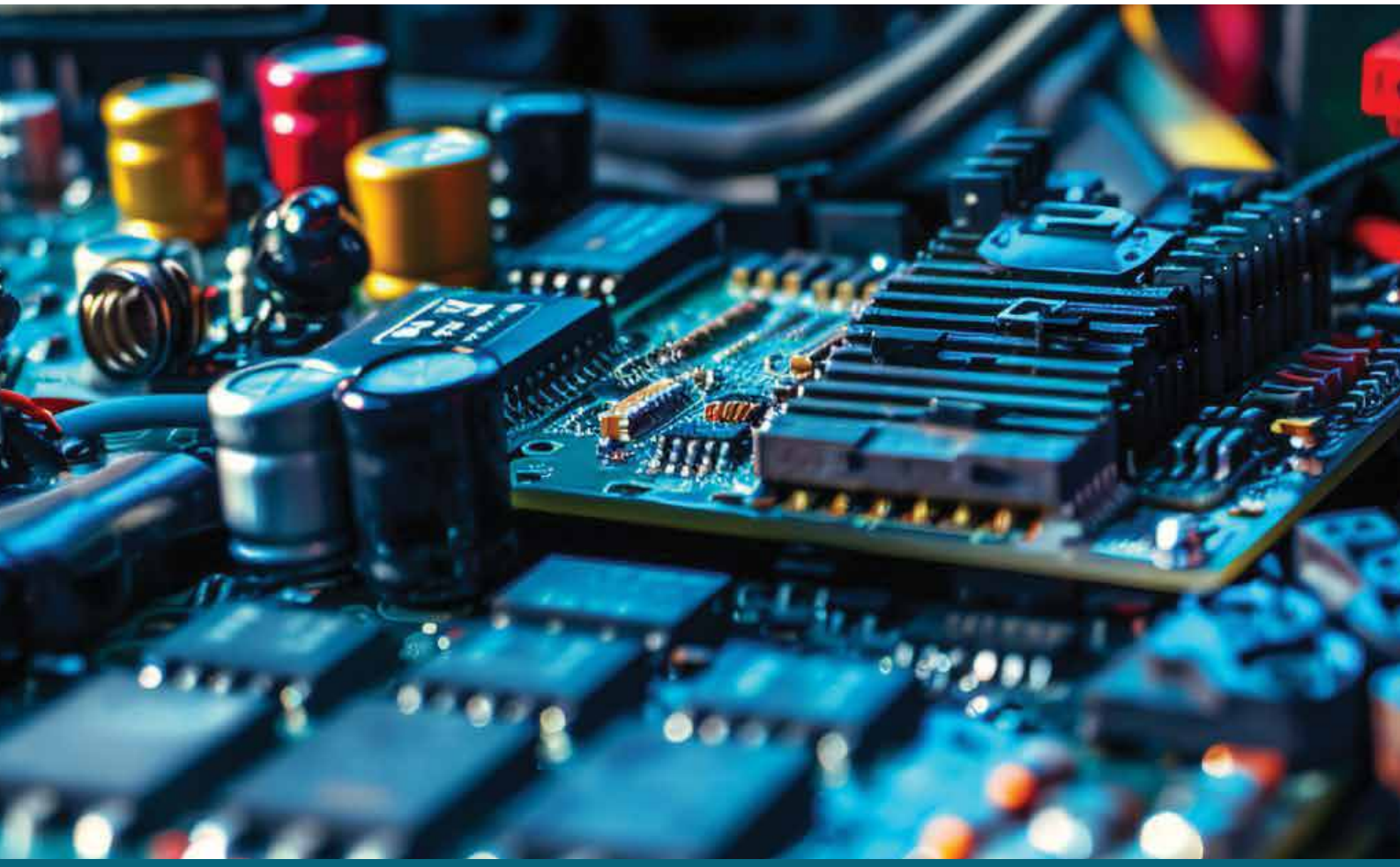
सत्यमेव जयते

NITI Aayog

TRADE WATCH

QUARTERLY

THEMATIC ANALYSIS:
ELECTRONICS TRADE



July-Sept (Q2 FY 2025-26)

TRADE WATCH QUARTERLY, Quarterly Report for the FY 2025-26

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NITI Aayog
Government of India
Sansad Marg, New Delhi-110001, India

TRADE WATCH

QUARTERLY

July-Sept (Q2 FY 2025-26)

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Foreword

Global trade is undergoing a period of adjustment, shaped by shifting demand patterns, technological advances, and supply chain realignment. These forces are redefining trade relationships and competitive strengths across economies. For India, this is a timely opportunity to consolidate recent gains and position itself for sustained trade growth.

Trade among developing economies has proved more resilient and expanded more steadily than trade with advanced markets, reflecting a redistribution of demand and productive capacity. This structural shift is being driven by deeper regional value chains, rising incomes, and stronger industrial linkages across the developing world, with Asia at its centre. India's trade performance in the FY26 remained steady, with exports outpacing imports and momentum concentrated in services and a select group of manufacturing sectors, notably electronics and automobiles. These trends highlight the importance of aligning India's trade strategy with regional integration, supply-chain participation, market diversification, and strategic trade partnerships in a global economy increasingly shaped by South–South linkages. At the same time, India is strengthening engagement with advanced, including the recently signed India–EU Free Trade Agreement, aimed at expanding market access and enhancing regulatory cooperation.

This edition of Trade Watch Quarterly focuses on electronics, a sector central to India's manufacturing and export ambitions. Over the past decade, electronics production and exports have expanded rapidly, supported by scale manufacturing and targeted policy interventions. The analysis places India's experience within the global electronics ecosystem, where competitiveness depends on technological depth, logistics efficiency, and adherence to international standards. Sustaining progress will require a shift from assembly-led growth towards deeper capabilities in components, design, and upstream activities, supported by coordinated action across trade, industrial, and skill-development policies.

I commend the Economics & Finance–I team at NITI Aayog for this concise and forward-looking edition, which will serve as a valuable resource for policymakers, industry, and researchers shaping India's long-term trade and industrial strategy.

New Delhi
12th February, 2026

(Suman Bery)

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FOREWORD

Internationally, the use of trade policy as a strategic instrument continued in Q2 of FY26 with tariff announcement and export controls. Preferential trade agreements are however beginning to reshape global commerce. The uncertain trade environment has made market access, supply-chain security, and technological capability central to trade outcomes. For India, these developments underline the importance of trade policy as component of Industrial policy for improving the competition as of manufacturing in terms of quality and cost.

The present edition of Trade Watch Quarterly offers a assessment of India's external sector. Trade performance in Q2 FY26 reflects export momentum, with merchandise and services exports growing faster than imports, despite a global environment. Service exports continue to cushion external balances, while the composition of merchandise exports points to early but meaningful progress toward more technology-oriented sectors, particularly electronics and electrical machinery.

The thematic focus of this edition is on electronics trade, a sector that is fundamental to the modern economy. The analysis highlights India's progress in final assembly, particularly in mobile phones, while also underlining gaps in upstream components such as semiconductors, displays, and batteries. The report situates India's electronics trade within the broader global context, drawing lessons from East Asian and Southeast Asian success stories, and identifying policy levers needed to move from assembly-led growth toward deeper integration into global electronics value chains.

I take this opportunity to acknowledge Shri B.V.R. Subrahmanyam, CEO of NITI Aayog, for his continued leadership and strategic guidance. I also extend my appreciation to the advisory board and the Economic & Finance-I team at NITI Aayog for their valuable contributions. Their work reflects a commitment to evidence-based policy and India's long-term objective of becoming a globally competitive, innovation-led export powerhouse.

New Delhi

February, 2026

Arvind Virmani

(Arvind Virmani)

बी. वी. आर. सुब्रह्मण्यम
B.V.R. Subrahmanyam
मुख्य कार्यकारी अधिकारी
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FOREWORD

Global trade remains positive and rising but is increasingly turbulent, shaped by slower growth, regional rebalancing, and structural shifts in demand. Trade is becoming more fragmented, with resilience and strategic considerations replacing past assumptions. India's trade performance in this context has remained resilient, recording a steady growth led by services and select merchandise exports, and deeper engagement with Global South markets. Sustaining gains will depend on adapting to changing value chains, seeking durable market access, expanding digital trade, and strengthening competitiveness through deeper integration into regional and global production networks.

The thematic focus on electronics highlights one of India's most significant export success stories. Electronics has emerged as India's second-largest export sector, driven primarily by mobile phones, where scale manufacturing and policy support have translated into rapid gains in global market share. Sustaining export momentum will require deeper integration into global value chains, lower trade costs, more efficient logistics and customs systems, and stronger capabilities in high-technology manufacturing and design.

I commend the team for their rigorous analysis and continued efforts in delivering timely and insightful assessments. I am confident that this edition will contribute meaningfully to ongoing discussions on strengthening India's trade performance and long-term economic resilience.

Dated: 11th February, 2026

[B.V.R. Subrahmanyam]

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Dr Pravakar Sahoo
Program Director, E&F I
NITI Aayog
Government of India

Acknowledgement

Global trade is unfolding in a more contested and uncertain environment. Intensifying geopolitical competition, a more complex security landscape, and emerging financial vulnerabilities linked to leveraged technology investments are reshaping the global outlook. Trade policy is increasingly driven by security and political considerations rather than efficiency or multilateral rules. Taken together, these shifts point to a global economy that is becoming more cautious and strategically aligned.

This edition of *Trade Watch Quarterly* reviews India's trade performance in Q2 FY26 and presents a thematic assessment of electronics trade, which represents a $4.6 trillion global market. Though India's share has increased in global electronics trade in recent years, particularly in mobile phones and telecom equipment, it still accounts for a small share. Global electronics trade remains large and highly competitive, with demand concentrated in circuits, telecom equipment, mobile phones, and data processing machines. Production networks in this sector are becoming increasingly value-chain driven, with greater specialization across stages of design, assembly, and manufacturing.

Additionally, global trade patterns are witnessing a marked expansion in South–South trade. Between 2005 and 2024, exports from developing economies to other developing economies expanded from around USD1.8 trillion to USD 7.3 trillion, a four-fold increase, while developing-to-developed economy exports rose from USD 2.1 trillion to USD 4.7 trillion. This shift presents a significant opportunity for India to diversify markets and strengthen trade linkages across the Global South.

The analyses presented in this edition aim to inform policy pathways by providing a comprehensive overview of trade trends, sectoral shifts, and trade balances, while situating India's trade performance within the evolving global context. I take this opportunity to thank Shri B.V.R. Subrahmanyam, CEO of NITI Aayog, for his continued guidance and support, and the advisory board members for their valuable input. As always, I commend the Economic & Finance-I team at NITI for their dedicated efforts in producing this edition of the Trade Watch Quarterly.

New Delhi
February'2026

Pravakar Sahoo

Dr. Pravakar Sahoo

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EXECUTIVE SUMMARY

Global trade growth moderated in mid-2025 but remained positive, with services outpacing goods, driven largely by higher prices and stronger performance in developing regions such as East Asia and Africa.[1] Against this backdrop, India's total merchandise and services trade grew by 5.1% year-on-year during April–September 2025, reaching $895.1 bn. Exports rose faster than imports, supported by robust growth in services and select merchandise categories.

India's merchandise exports were led by electrical machinery, mineral fuels, cereals, automobiles, and precious stones, with smartphones, non-basmati rice, and passenger vehicles emerging as key growth drivers. Imports remained dominated by mineral fuels, electronics, precious stones, and fertilisers, the latter surging due to favourable monsoon conditions. In terms of direction, India recorded strong export growth to markets such as Hong Kong, China, the UAE, and the US, while ASEAN showed some moderation. A major structural shift highlighted is the deepening of trade among developing economies between 2005 and 2024, which now accounts for a rising share of global exports. India's trade trajectory aligns with this broader Global South rebalancing, supported by regional value chains, rising intra-Asia trade, and new trade corridors. At the same time, e-commerce has emerged as a critical enabler of future export growth. India is now among the world's top six e-commerce markets, with strong momentum in electronics-led online trade. While e-commerce exports are currently small, they are projected to scale rapidly and could contribute up to a quarter of India's merchandise exports by 2030, provided regulatory, logistics, and MSME-related constraints are addressed.

The thematic focus on electronics underscores a decade-long transformation. Electronics has become India's second-largest export sector, driven overwhelmingly by mobile phones, where India has developed a strong comparative advantage through assembly-led manufacturing and policy support. However, India remains heavily import-dependent for components such as semiconductors, integrated circuits, batteries, and displays, which dominate global electronics demand. Comparative analysis shows that while India is competitive in mobile phones and telecom equipment and power-electronics segments, it remains marginal in high-value, technology-intensive components that anchor global value chains.

Global electronics trade is highly concentrated in East Asia, with China, Taiwan, South Korea, and Vietnam deeply embedded in component-intensive production networks. India, by contrast, is positioned primarily as a final-market supplier, exporting finished electronics largely to consumption markets such as the US and UAE, rather than participating in dense intra-Asian processing trade. As a result, India lacks scale, value addition, technological learning, and spillovers associated with integration.

Domestic electronics manufacturing has expanded rapidly but remains highly concentrated in mobile phones, with gradual diversification into industrial electronics, components, automotive electronics, and consumer devices. India's tariff structure is more protective than peers like China and Vietnam, supporting domestic assembly but it raises costs for component-intensive production and weakens

1 https://unctad.org/system/files/official-document/ditcinf2025d10_en.pdf

India's integration into global supply chains. Recent policy initiatives, including the Electronics Component Manufacturing Scheme, semiconductor mission, customs duty rationalisation, and support for e-commerce exports, signal a strategic push to move India up the electronics value chain.

India's electronics strategy must transition from assembly-led gains to component-led manufacturing. On the supply side, incentives need to be aligned toward domestic value addition, sustained R&D, and ecosystem deepening supported by anchor investments that transfer technology, improve standards, and generate stable demand for local suppliers. On cost competitiveness, coordinated fiscal, trade, and logistics reforms are essential to close persistent structural cost gaps. On the demand side, while recent FTAs improve external market access, greater emphasis is required on predictable domestic procurement, export finance, and regulatory simplification to attract investments especially in a turbulent geopolitical environment. These measures can anchor India's transition from a manufacturing base to a globally competitive electronics ecosystem and support the $500 bn manufacturing ambition by FY2030.

Overall, the analysis points to a dual reality that while India has made strong gains in trade and electronics assembly, sustaining long-term competitiveness will hinge on much deeper integration into global value chains. This transition requires moving beyond labour-intensive assembly toward higher value-added activities such as PCB design, semiconductor assembly and testing, power electronics, alongside improvements in logistics efficiency and regulatory simplification.

HIGHLIGHTS

1. In Q2 FY'26, exports drove trade growth, with merchandise and services exports both rising by about 8.5% y-o-y, outpacing import growth.
2. In Q2 FY26 trade saw strong momentum, with exports led by a 33.4% surge in electrical machinery, while fertiliser imports stood out with a 239% y-o-y jump.
3. In Q2 FY26, trade destinations remained broadly stable, with exports to top markets growing strongly led by Hong Kong, China and the US, while imports from the UAE surged 48% y-o-y.
4. South–South trade has outpaced South–North trade, with exports among developing economies rising from about $1.8 trillion in 2005 to $7.3 trillion in 2024, exceeding their exports to developed economies.
5. Cross-border e-commerce will be emerging as a key driver of India's export growth, supporting the push toward higher merchandise exports by 2030, with electronics likely to play a central role.
6. The electronics segment represents a $4.6 trillion (tn) global market. India's share in this market stands at around 1% for 2024.
7. India's export growth between 2015 and 2024 is concentrated in segments like telecom and mobile phones, while segments such as chips and semiconductors show minimal gains.
8. India's electronics exports are concentrated in mobile phones, which make up 52.5% of the basket, while power equipment and wires contribute smaller shares. Imports are dominated by integrated circuits (23.7%), mobile phones (17.5%), and data-processing machines (10.6%).
9. India's electronics exports are largely directed to the USA, UAE, and Netherlands, with mobile phones driving most of this trade. Key markets for high-tech components like integrated circuits and semiconductors remain dominated by China, Hong Kong, and Taiwan.
10. India must strengthen electronics export performance by addressing structural cost disadvantages, expanding targeted export financing, improving logistics efficiency, and boosting domestic manufacturing of strategic components.
11. India should enhance market access and integration into global value chains through proactive trade facilitation, government procurement support, leveraging strategic FTAs and anchor investments, MSME participation, and higher domestic value addition.

Contents

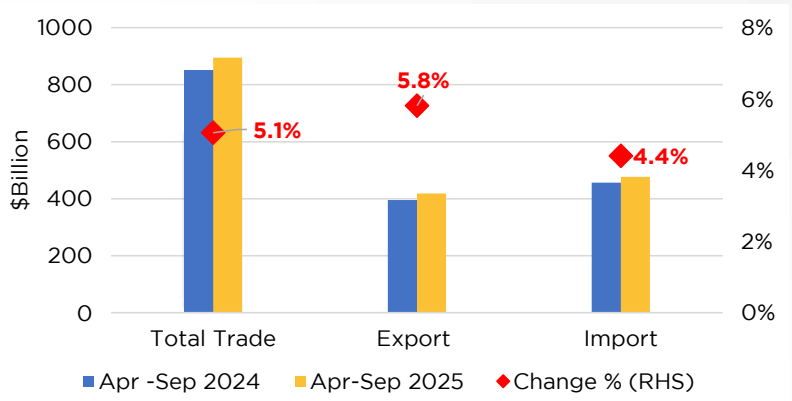
A.
INDIA'S TRADE ANALYSIS

A. India's Trade Analysis

Global goods and services trade growth between July-September slowed but remained positive with services trade growth outpacing that of goods and expanding by 4% and 2% respectively as compared to the previous quarter. The increase in value was driven by higher prices. The increase was supported by stronger trade performance in developing countries with robust performance particularly in East Asia and Africa[2].

India's merchandise and services trade performance recorded a 5.1% y-o-y increase between April-September 2025, supported by strong export growth in merchandise and services exports. During this period, total trade reached $895.1 bn. Exports witnessed a growth of 5.8% and imports 4.4% y-o-y, with exports reaching $418.6 bn and imports at $476.5 bn between April–September 2025. (Fig 1)

Fig 1: Total Trade performance between Apr-Sept'25



Source: Department of Commerce, MoC&I, GOI

1. Merchandise and Services Analysis

In September 2025, merchandise exports recorded a strong increase of 6.1%, reaching $36.1 bn, and imports also witnessed a strong surge of 17.6%, reaching $69.1 bn (Fig 2). India's total trade (merchandise and services) in Q2 FY26 grew by 6.4% y-o-y, with services trade growth of 7% and merchandise trade of 6%. In Q2 FY26, merchandise exports increased by 8.4% y-o-y to $108 bn, and imports rose by 5% reaching $196 bn (Fig 3). This resulted in a net merchandise deficit of $87.9 bn for the quarter.

Fig 2: Merchandise Trade (Monthly)

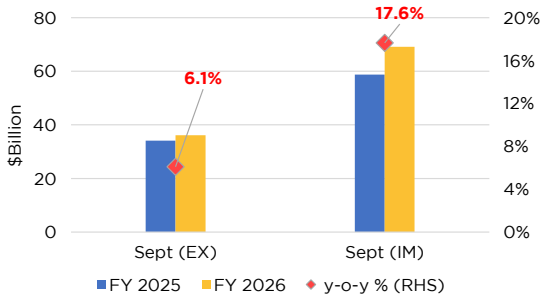
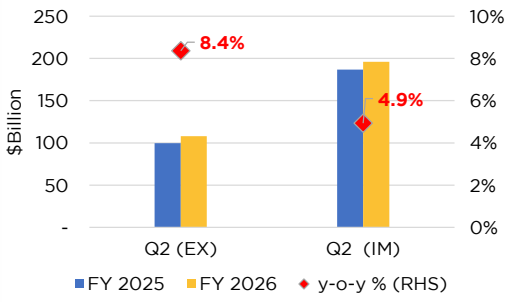


Fig 3: Merchandise Trade (Quarterly)



Source: Department of Commerce, MoC&I, GOI

2 https://unctad.org/system/files/official-document/ditcinf2025d10_en.pdf

India's services exports for September'25 stood at $37 bn, registering a strong y-o-y growth of 12.6%, while services imports increased by 8.1% reaching ~$18 bn (Fig 4). During Q2 FY26, services exports witnessed a robust annual expansion of 8.7%, reaching $102 bn and services imports rose marginally by 3.9% reaching $51 bn during the same period, resulting in a net services trade surplus of $50.9 bn (Fig 5). The combined balance of trade in goods and services registered a net deficit of $37 bn for this quarter.

Fig 4: Services Trade (Monthly)

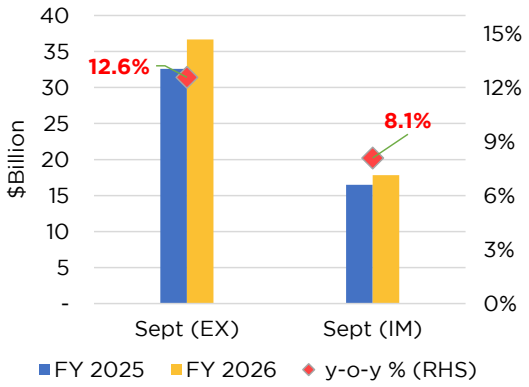
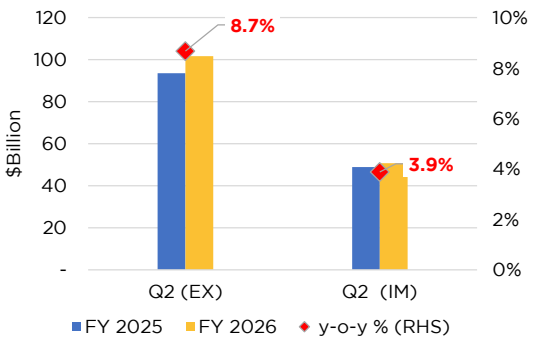


Fig 5: Services Trade (Quarterly)



Source: Department of Commerce, MoC&I, GOI

2. Compositional Analysis

2.1 Merchandise Exports

In Q2 FY26, the leading[3] exports amounted to $68.2 bn marking a y-o-y increase of 13%. The leading commodities continued to be mineral fuels (12.7% share), electrical machinery and equipment (10.5%), and nuclear reactors (8.7%). For Q2 FY26 y-o-y growth was recorded for all the top ten commodities with electrical machinery, cereals and vehicles recording strong y-o-y growth of 33.4%, 19% and 18.5% respectively (Fig 6). The top commodities remained the same as the previous quarter.

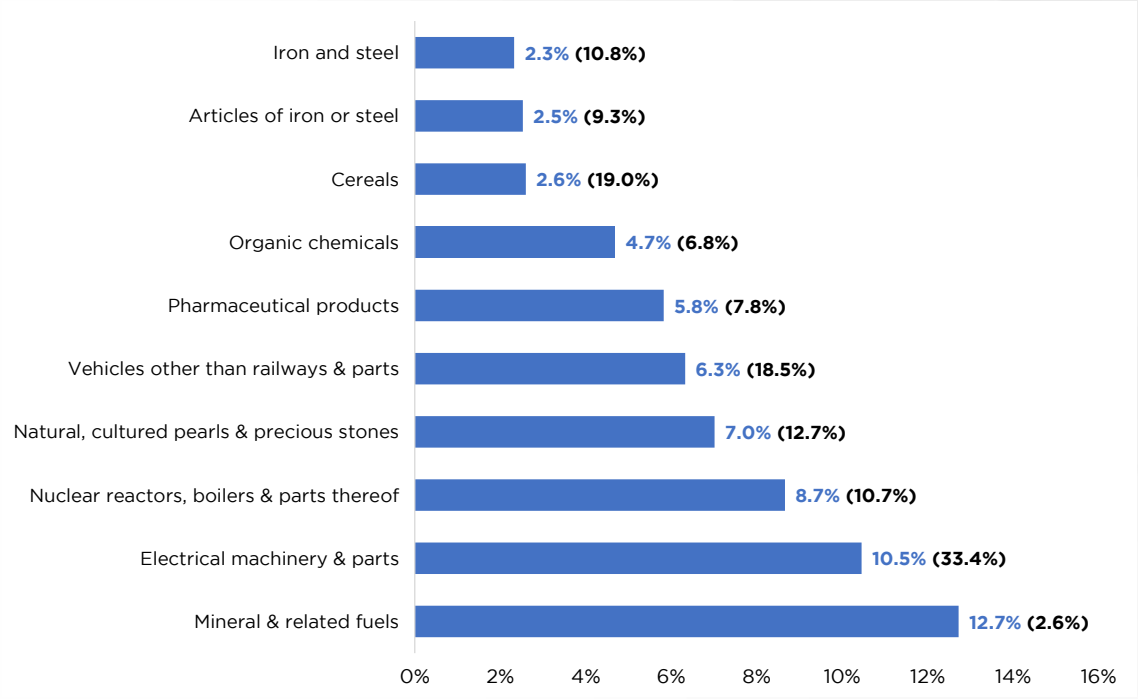
Exports of electrical machinery recorded a sharp increase, supported by the sustained expansion in smartphone shipments. Cereals exports strengthened following the resumption of non-basmati rice exports after the withdrawal of all export restrictions. In parallel, merchandise exports from the automobile sector improved, reflecting higher outbound shipments of passenger vehicles[4].

Under natural, cultured pearls and precious stones, exports recorded strong growth of 12.7%, driven by higher demand for loose cut and polished diamonds (HS 710239) and jewellery or articles made from precious metals such as platinum or palladium (HS 711319).

3 Leading commodities are the top ten commodities with the highest value share in exports.

4 Notable increases for these particular goods have been recorded for electrical machinery, cereals and vehicles: HS 851713, HS 100630 and HS 870322

Fig 6: Composition and Growth of Exports



Note: Y-o-y growth of the commodity in India's export for this quarter is mentioned in parenthesis
Source: Department of Commerce, MoC&I, GOI

2.2 Merchandise Imports

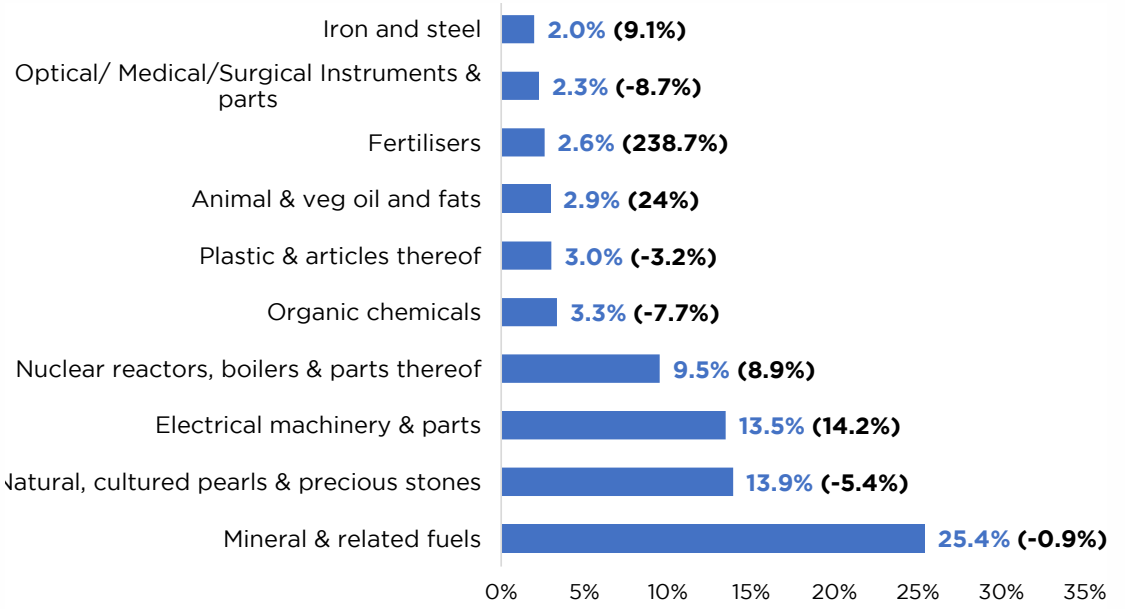
In Q2 FY26, the leading[5] imports amounted to $153.6 bn marking a y-o-y increase of 4.6%. The imports continue to be led by mineral fuels (25.4% share), natural and cultured pearls (13.9%), electrical machinery (13.5%), and nuclear reactors (9.5%). Among the top ten import categories, fertilisers replaced plastics and articles as compared to the previous quarter (Fig 7).

In growth terms, fertilisers registered a sharp y-o-y increase of 239%, rising from $1.5 bn to $5.1 bn, driven by favourable monsoon conditions and strengthening domestic demand. This expansion was largely attributable to higher imports of DAP and urea. Imports of animal and vegetable oils and fats also increased by 24% y-o-y, reflecting higher inflows of crude palm oil and soybean oil. Electrical machinery recorded a 14% increase, led by rising imports of processors and controllers, smartphone components, and electronic integrated circuits.

By contrast, five product categories within the top ten imports for the quarter registered contractions. The steepest decline was observed in optical and medical instruments and parts, which fell by 8.7%, while the mildest contraction was recorded in mineral fuels and oils, at 0.9% due to a decline in demand for liquified natural gas (LNG).

5 Leading commodities are the top ten commodities with the highest value share in imports.

Fig 7: Composition and Growth of Imports



Note: y-o-y growth of the commodity in India's imports for this quarter is mentioned in parentheses
Source: Department of Commerce, MoC&I, GOI

3. Trade Direction

3.1 Merchandise Exports

India's exports to its top markets[6] contributed around 52.5% of total exports in Q2 FY26, amounting to ~$55.1 bn, witnessed a sharp y-o-y increase of 9.5%. Hong Kong entered the top ten export destinations during the quarter replacing Australia in the previous quarter.

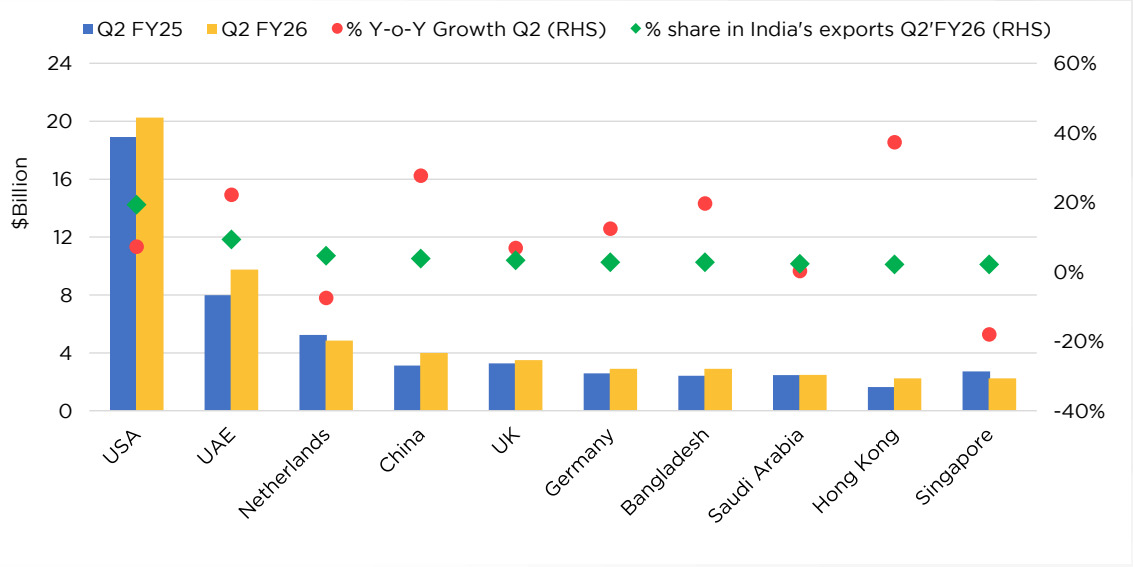
Among the top ten export destinations, India recorded positive y-o-y growth across eight markets, with the strongest growth observed in Hong Kong, although total exports to the destination remain modest at $2.2 bn (Fig. 8). Export growth to Hong Kong was driven by higher shipments under HS 71, particularly diamonds, articles of silver jewellery, and precious stones.

Other destinations posting strong growth include China, where exports expanded by 27.7%, supported by increased shipments of light oils and their preparations, shrimps, light-emitting diodes, and non-alloyed aluminum. Exports to the UAE also surged, reflecting rising demand for smartphones, mineral fuels, and articles of jewellery.

Contractions were limited to two destinations within the top ten. Exports to Singapore and the Netherlands declined by 18% and 7.5%, respectively. The decline in exports to the Netherlands was primarily driven by a sharp fall in smartphone shipments and mineral fuels, while exports to Singapore weakened mainly due to lesser shipments of mineral fuels.

6 Top markets are those that account for the top 10 shares of total exports in Q2 FY26.

Fig 8: India's exports to major destinations

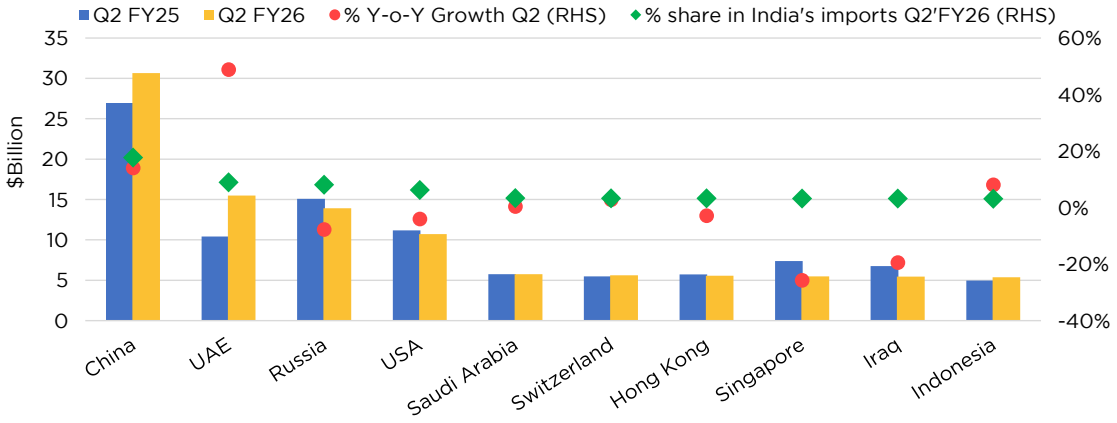


Source: Department of Commerce, MoC&I, GOI

3.2 Merchandise Imports

India's share of imports from its top[7] markets continued to contribute around 60% of total imports in Q2 FY26 and amounted to ~$104 bn. China, UAE and Russia continued to remain the top countries importing from India with UAE recording a sharp import growth of 48% and Russia a decline of about 7.8%. Decline in y-o-y growth was recorded with five economies with the sharpest in Singapore of 25.7% and the least with the US of 4% (Fig 9).

Fig 9: India's imports from major destinations



Source: Department of Commerce, MoC&I, GOI

Rising imports from the UAE were primarily driven by higher shipments of petroleum products, copper wires, and unworked diamonds. Imports from China increased on the back of higher inflows of lithium-ion batteries and other electronic components under HS 85. By contrast, imports from Singapore declined, largely reflecting a contraction in coal shipments.

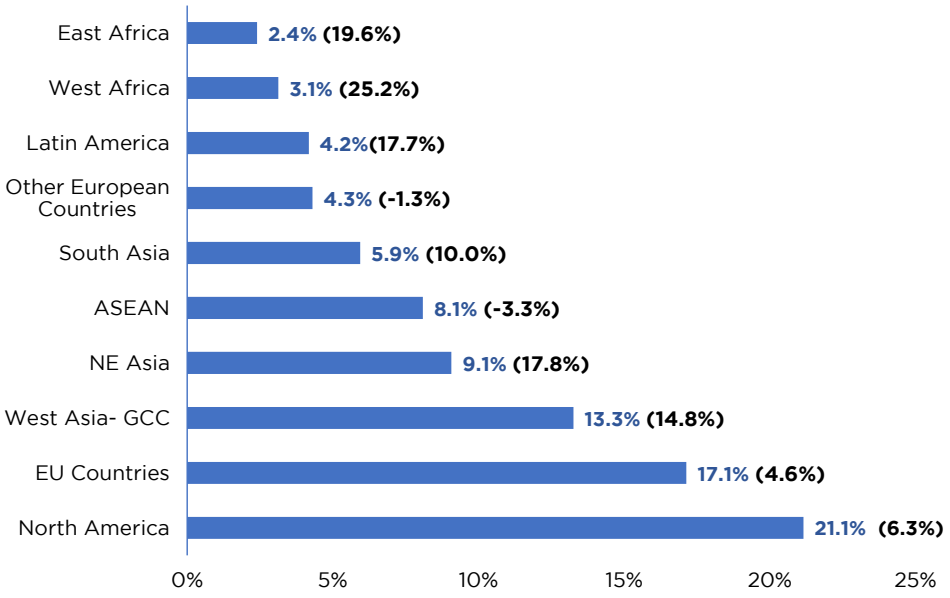
7 Top markets are those that account for the top 10 shares of total imports in Q2 FY26.

4. Regional Analysis

4.1 Merchandise Exports

India's exports to its top 10 export regions, accounting for a significant 89% of its total exports in Q2 FY26, show a y-o-y increase of 7.7%. The top three regions recorded positive growth with North America, accounting for approximately a quarter of total exports during this quarter, recording a y-o-y growth of around 6.3%. EU countries, another major export destination, experienced a y-o-y growth of ~4.6%. ASEAN was the only major region which recorded a decline of 3.2% (Fig 10).

Fig 10: Region-Wise Export Composition and Growth



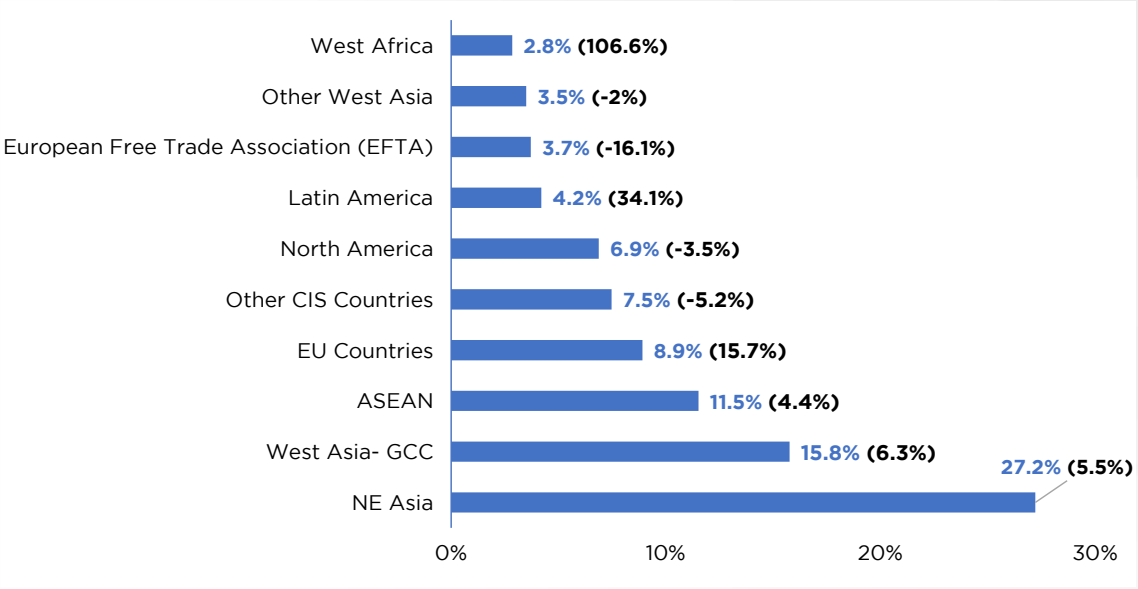
Note: y-o-y growth of the commodity in India's exports for this quarter is mentioned in parentheses
Source: Department of Commerce, MoC&I, GOI

4.2 Merchandise Imports

India's Q2 FY26 imports registered an overall growth of 4.7% from the top ten regions, reaching $195 bn this quarter, these regions collectively account for 92% of India's imports during the quarter. Six out of ten regions continue to experience positive y-o-y growth. India's imports mainly came from North East (NE) Asia, West Asia (GCC), and ASEAN, accounting for ~55% of total imports during the quarter (Fig 11).

Strong growth was observed in West Africa, with imports rising from $2.6 bn to $5.5 bn during the quarter, driven by a sharp increase in shipments from Ghana and Nigeria. At the commodity level, the expansion was led by higher imports of crude oil, natural gas, and unwrought forms of stones and diamonds. Latin America also recorded robust growth of around 34%, supported by increased imports of unwrought forms, soybean oil, and copper ores. By contrast, imports from North America contracted by 3.5%, while those from EFTA declined by 16.0%. The contraction in EFTA was primarily attributable to reduced imports of unwrought forms, coal, and soybean oil.

Fig 11: Region-Wise Import Composition and Growth



Note: y-o-y growth of the commodity in India's imports for this quarter is mentioned in parentheses
Source: Department of Commerce, MoC&I, GOI

5. Deepening Trade Among Developing Economies

Between 2005 and 2024, exports among developing economies have emerged as a faster-growing pillar of global exports, than exports of developing to developed economies. The exports among developing economies expanded from about $1.8 trillion to $7.3 trillion, a four-fold increase, while exports of developing to developed economies rose from $2.1 trillion to $4.7 trillion, or a little over double. India's exports to developing countries during this period has increased fourfold from $56 bn to $244 bn, although its share remains at 2% in 2024.

Fig 12: Merchandise Export Growth (2005=100)

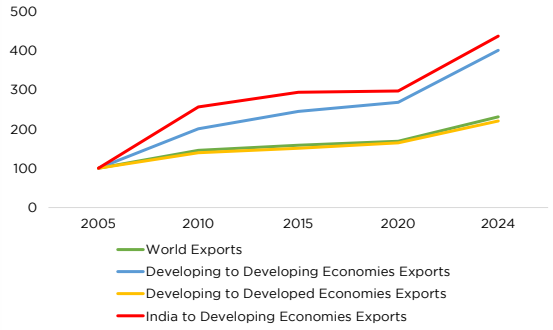
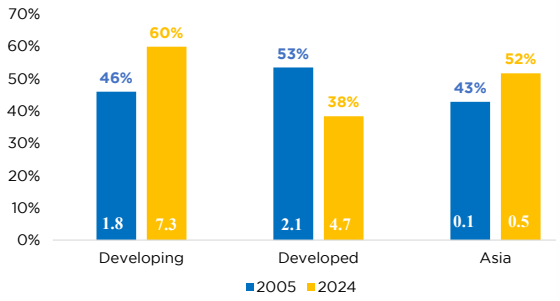


Fig 13: Developing-Country Exports Share by Region



Note: Volume in trillion dollars
Source: ITC Trade Map

Between 2005 and 2024, export expansion shifted towards developing economies. The share of exports among developing economies rose from 46% to 60%, while the share of exports of developing economies to developed economies' fell from 53% to 38%. Asia emerged as one of the central drivers of this rebalancing with exports nearly quadrupling over the period and its share in exports of developing economies rose from 43% to 52%. As a result, exports among developing economies now make up a larger and growing share of their total exports, highlighting that growth

opportunities are increasingly driven by demand within the developing world rather than reliance on advanced economies alone. This surge reflects the deepening of regional value chains and industrial integration in the Global South, especially in Asia, where intermediate and manufactured goods now constitute a large share of trade and intra-regional linkages account for more than half of total exports from the region.[8]

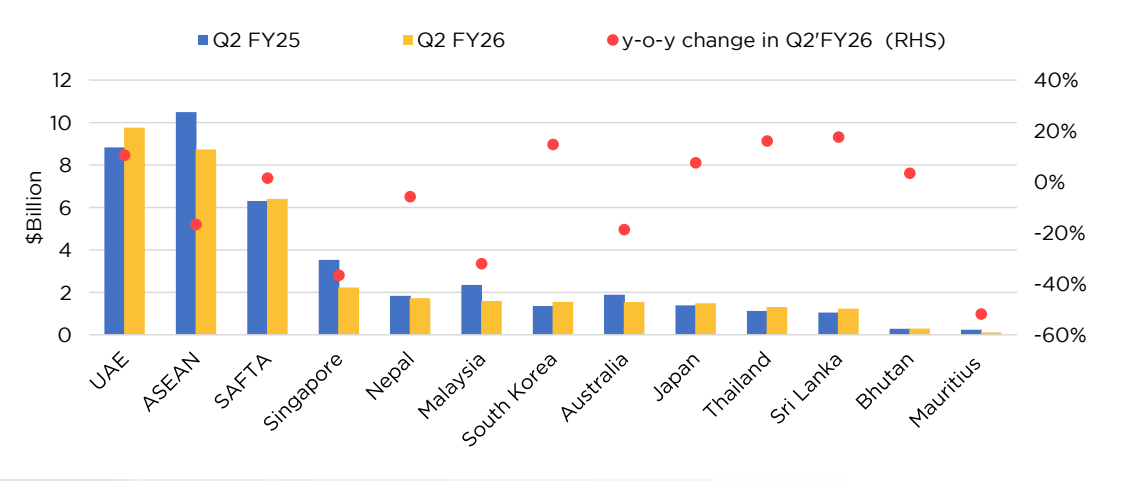
Additionally, rising incomes and a growing middle class across developing nations have boosted demand for higher-value goods from peers, while regional trade agreements like the African Continental Free Trade Area, , and the India-Middle East-Europe Economic Corridor, have also lowered trade costs and strengthened economic ties within the Global South.[9]

6. Merchandise Trade with FTA Partners

India's exports with its Free Trade Agreement (FTA) partner countries in Q2 FY26 amounted to $38 bn with y-o-y of 7% and total imports from FTA partners increased by 5% y-o-y, reaching $69.8 bn, resulting in a trade deficit of $31 bn.

In India's export shipments to FTA countries the contraction was led by ASEAN (-16.8%), alongside sharp declines in Singapore (-36.7%), Malaysia (-32.1%), Australia (-18.7%), and Mauritius (-51.8%). Offsetting these declines, exports recorded growth to UAE (10.5%), South Korea (14.7%), Thailand (16.1%), Sri Lanka (17.6%), and Japan (7.5%) (Fig 14).

Fig 14: Exports- FTA Partners



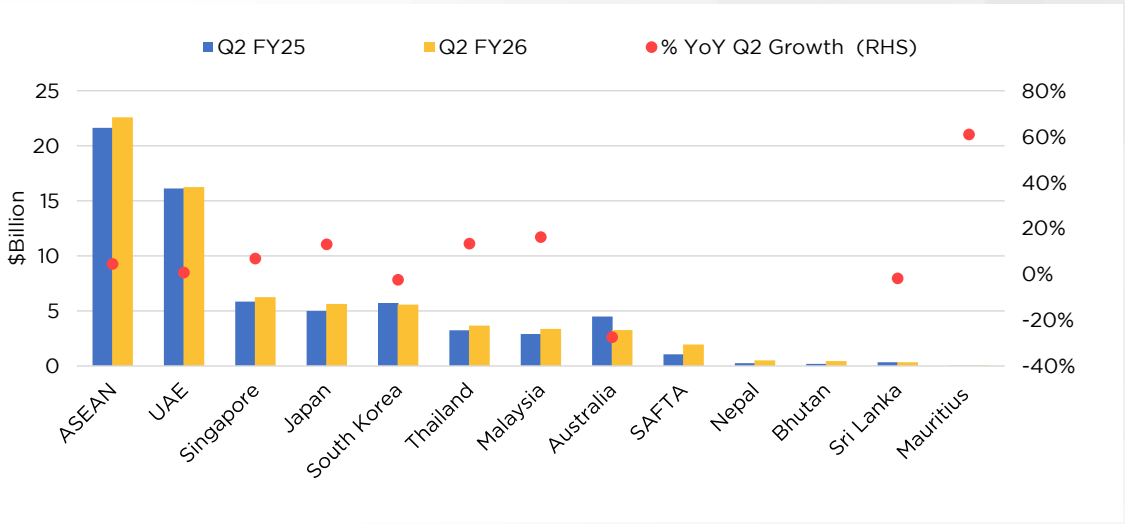
Source: Department of Commerce, MoC&I, GOI

Imports from FTA partners increased from $66.8 bn to $69.8 bn, driven by higher inflows from ASEAN (4.4%), SAFTA (82.2%), Singapore (6.7%), Malaysia (16.2%), Japan (13.0%), and Thailand (13.3%). Imports declined from Australia (-27.5%) and South Korea (-2.6%). Overall, India's FTAs remain resilient, with strong export gains in key markets and rising imports signaling deeper trade integration.

8 https://unctad.org/system/files/official-document/ditcinf2025d11_en.pdf

9 https://www.sc.com/en/news/corporate-investment-banking/reshaping-global-trade-the-rise-of-south-south-corridors/

Fig 15: Imports- FTA Partners



Source: Department of Commerce, MoC&I, GOI

7. The Growing Role of E-Commerce in Exports

Building on earlier Trade Watch Quarterly analyses of digitally delivered services and creative economy exports, this section examines e-commerce as the goods-trade analogue of digital delivery. E-Commerce has become an important trade channel by lowering transaction and distribution costs and enabling firms, especially smaller sellers, to access domestic and cross-border markets at scale. Its market size increasingly reflects how deeply an economy is integrated into digital trade. The global e-commerce landscape is highly concentrated across a few large economies. China is the single largest e-commerce market globally, with an estimated market size of ~$3.0 tn, accounting for about 39% of the global market. The United States ranks second, with a market size of ~$1.16 trillion, representing around 20% of global market value. Together, China and the United States account for nearly 60% of global e-commerce market size. Other major markets include the United Kingdom (~$196 bn), Japan (~$193 bn), and South Korea (~$147 bn), each contributing a 4–6% share of global market size[10].

India currently ranks among the top six e-commerce markets globally. The market size increased from $14 bn in 2014 to ~$120 bn in 2024, accounting for around 4% of global e-commerce market value. As per ITA, India is expected to emerge as the fastest-growing retail e-commerce market among 20 countries during 2023–2027, with a CAGR of 14.1%.[11]

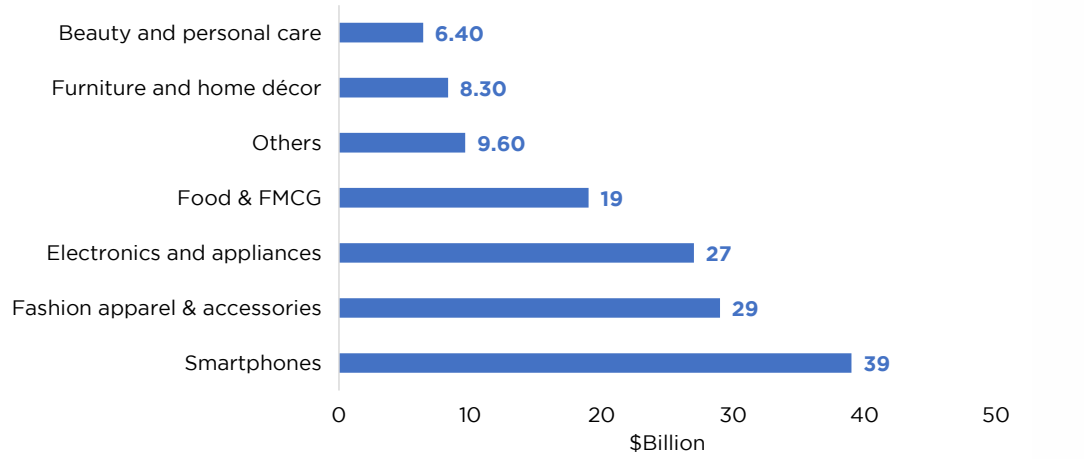
In 2024, smartphones constituted the largest segment of India's e-commerce market at $39 bn, followed by fashion and apparel ($29 bn) and electronics and appliances ($27 bn), highlighting the dominance of consumer durables and lifestyle categories (Fig 16). The sector's growth has been supported by rising smartphone penetration, an expanding internet user base, and increasing competition among domestic and global platforms. Additionally, the rapid expansion of the direct-to-consumer (D2C)

10 https://www.doofinder.com/en/statistics/ecommerce-market-size-by-country
11 https://www.trade.gov/ecommerce-sales-size-forecast

segment, supported by significant investor interest, signals a structural shift in how Indian firms access digital retail channels.

Electronics related segments smartphones, electronics and appliances, together accounting for approximately $65 bn, or about half of total e-commerce market, making electronics the single largest segment of India's online retail market. Electronics e-commerce presents an opportunity to leverage scale, productivity gains, formal employment, and closer linkages with India's growing electronics manufacturing ecosystem. Supporting e-commerce, particularly electronics-oriented exports, can therefore contribute to export diversification, job creation, and broader economic growth as India progresses towards the goal of Viksit Bharat by 2047.

Fig 16: E-commerce market size India 2024, by segment



Source: Statista

E-Commerce Exports from India

India's e-commerce exports, though currently at an early stage, are poised for a sharp expansion over the coming decade. In FY2023, e-commerce exports were valued at around $4–5 bn, contributing roughly 0.9–1.1% of India's total merchandise exports and about 0.11–0.14% of GDP. With growing global demand for Indian products, wider adoption of digital platforms, improved logistics, and supportive policy measures, e-commerce exports are projected to rise significantly. As India targets $1 tn in merchandise exports by 2030 under the Viksit Bharat vision, e-commerce exports are projected to scale rapidly to US$200–300 bn[12]. This expansion could raise their share in India's total exports to 20–30% and their contribution to GDP to 2.9–4.3%, underscoring the potential of e-commerce to emerge as a key pillar of India's export strategy and broader economic growth. Given India's 500 mn-strong labour force and 63 mn MSMEs contributing ~29% of GDP and 43% of exports, e-commerce exports hold the potential to unlock new growth opportunities. This transition is especially significant for MSMEs, which have already enabled lakhs of small producers to access global markets through digital platforms.

12 https://www.ey.com/content/dam/ey-unified-site/ey-com/en-in/newsroom/2024/07/ey-enabling-e-commerce-exports-from-india.pdf

Challenges and Constraints in India's E-Commerce Export Ecosystem [13,14]

- **Complex Regulatory and Compliance Framework:** Multiple approvals for customs, GST, and foreign exchange, along with the absence of a unified digital single window, increase compliance burden and costs for MSMEs.
- **Absence of dedicated customs codes for e-commerce exports:** India does not yet have separate customs supervision or declaration codes for e-commerce shipments, unlike countries such as China, resulting in documentation-heavy processes, delays in clearance, and inadequate differentiation between B2B and low-value e-commerce exports.
- **Inefficient reverse logistics and duty treatment of returns:** The lack of a clear, streamlined framework for handling cross-border e-commerce returns leads to re-imported goods often being treated as fresh imports and subjected to duties, increasing costs, delaying refunds, and discouraging MSMEs from scaling global e-commerce operations.
- **Lack of Coordinated Ecosystem Support:** Unlike traditional exporters, e-commerce exporters receive limited support for upgrading warehousing, marketing, or technology infrastructure.
- **Absence of International Cooperation Framework:** Absence of e-commerce-specific bilateral arrangements limits market access, logistics collaboration, and regulatory harmonization.
- **Low Awareness and Institutional Support:** Many MSMEs lack awareness, training, and institutional support for cross-border e-commerce, restricting their global competitiveness.

Global best practices show countries that have streamlined e-commerce trade such as China have introduced 24-hour digital customs clearance, dedicated cross-border pilot zones with tax incentives, and distinct supervision codes (9610 & 1210) to simplify compliance, while also enabling platform-led logistics and a single-window duty-free returns system[15] and South Korea supports MSMEs through relaxed export declaration thresholds, consolidated packaging, and its Export e-Room model, reducing procedural burdens[16]. The United States complements this with institutional backing via its E-Commerce Solutions Centre and SBA/USCS networks, offering training, financing, and market linkages[17]. Together, these measures highlight how targeted customs reforms, logistics integration, and SME support can reduce costs, expedite delivery, and expand global reach.

The Government of India has taken targeted steps to intensify e-commerce export support for MSMEs by extending major export incentive schemes including Duty Drawback, RoDTEP and RoSCTL benefits to postal e-commerce shipments effective January 15, 2026, thereby levelling the playing field and enhancing competitiveness

13 https://www.ey.com/content/dam/ey-unified-site/ey-com/en-in/newsroom/2024/07/ey-enabling-e-commerce-exports-from-india.pdf
14 https://gtri.co.in/gtriRep8.pdf
15 https://www.ey.com/content/dam/ey-unified-site/ey-com/en-in/newsroom/2024/07/ey-enabling-e-commerce-exports-from-india.pdf
16 https://cm.asiae.co.kr/en/article/2025082817242193685
17 https://www.trade.gov/welcome-ecommerce-solutions-center

for small sellers across smaller towns and remote regions[18]. Additionally, the launch of E-Commerce Export Hubs (ECEHs) aims to provide integrated facilities for logistics, customs clearance, packaging, quality certification and warehousing, thereby reducing cost, time and regulatory friction for cross-border digital trade[19].

To build on these measures, advancing cross-border e-commerce requires coordinated policy and regulatory reforms to reduce trade frictions. Priorities include simplifying and harmonising customs procedures for low-value shipments, ensuring predictable and transparent tariff regimes, and strengthening regionally coordinated e-commerce logistics, supported by platform-led consumer protection mechanisms. Further progress will depend on deeper digital integration of trade and logistics systems, streamlined frameworks for returns and re-imports, and enhanced export-readiness support for MSMEs to deliver sustained gains in cross-border participation and export performance.

18 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2215141

19 https://www.ibef.org/news/e-commerce-export-hubs-to-support-indian-smes-with-cost-effective-logistics-and-streamlined-regulatory-processes

B.
THEMATIC ANALYSIS: ELECTRONICS TRADE

B. Thematic Analysis: Overview

Over the past decade, India's electronics industry has emerged as a critical driver of manufacturing growth. The value of electronics production increased nearly six-fold from ₹1.9 lakh crore in 2014–15 to ₹11.3 lakh crore in 2024–25.[20] The sector accounts for 3.4% of GDP and has created nearly 25 lakh jobs in the past decade.[21] In 2023-24, RBI estimated that India's electronics production accounts for 3% of the global total, with this share increasingly growing over the years.[22]

On the trade front, there has been an exponential growth at 17.2% CAGR between 2015-24 as opposed to the global growth of 4.4%. In 2015, electronics[23] exports were at $8.6 bn at 3.01% of India's total exports and has now become the second largest export sector valued at $42 bn, accounting for 10% of the export basket for India in 2024.[24]

The sector has generated significant employment both directly and indirectly. Government data indicate that electronics manufacturing and related value chains have created over 2,50,000 indirect and 1,20,000 direct jobs of which 70% are held by women between the age of 19–24 years.[25] The flagship PLI scheme has accounted for the bulk of job creation in the past decade with its backward linkages with investors of the scheme. India's leading segment, mobile phones for which it stands as the second-largest manufacturer in the world is also a labour-intensive process of assembling. Indian firms have also expanded their presence across newer segments of the mobile phone value chain with proven abilities in designing.

The global electronics industry is a massive and geographically concentrated market, valued at over $4.3 tn[26], with production dominated by a handful of countries like China, Taiwan, USA, South Korea, Vietnam ($143.3 bn) and Malaysia ($121.4 bn). Vietnam and Malaysia have emerged as important nodes in global value chains (GVCs), with electronics exports that are significantly larger than India's, underscoring their deeper integration into export-oriented manufacturing networks. In contrast, India's share of global electronics exports remains at around 1% despite rapid recent growth. China's entrenched dominance, together with mature players like South Korea and Japan specialising in high-value components (such as semiconductors and displays), highlights the intensity of the competitive landscape India faces.

Indian policymakers have responded with sustained and evolving support to integrate the country into global electronics production and trade. The National Policy on Electronics and the broader Make in India initiative have been followed by successive measures, such as the PLI schemes for large-scale electronics and IT hardware, which have played a central role. These incentives reduce production costs, attract investment, and encourage firms to localise production, contributing to rapid expansion of manufacturing units and exports. The government has expanded support to input segments via the Electronics Components Manufacturing Scheme

20 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2177755&reg=3&lang=2
21 https://www.ibef.org/exports/electronic-and-computer-software-industry-in-india
22 https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/0BULLETINJULY18072024C1D39FE2E7AB4F8893C8E207C7818398.PDF
23 Electronics segment here refers to all products under HS 85 and 5 products under HS 84 (8471-73, 8443 and 8470)
24 Values here have been computed by the authors of the publication based on data on ITC Trade Map
25 https://www.orfonline.org/public/uploads/posts/pdf/20240221230009.pdf
26 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2034096&reg=3&lang=2

(ECMS) and other targeted incentives to bolster domestic component ecosystems. India has also streamlined FDI rules, improved tax and customs regimes to make the investment climate more attractive, and aims to raise its share of global electronics exports to 4–5% by 2030 while targeting $500 bn in production[27].

1. Mapping the Global Electronics Trade Profile

The electronics trade profile has been examined in detail particularly under HS 85 and select top products of HS 84 at the 4-digit level. The segment reflects a $4.6 tn of world demand with the top twelve products amounting to $3.6 tn and accounting for 78% of the total global demand for 2024. Within the top twelve product categories which together account for nearly $3.6 tn of global imports, India's exports are only $33.9 bn translating to a share of 0.9% for the top 12 segments.

India is competitive in six of these twelve segments indicated by a strong Revealed Comparative Advantage (RCA)[28] being greater than one, but it continues to remain import-dependent in critical electronic components such as circuits, semiconductors and batteries. India's exports are primarily concentrated in final-assembly products, while the bulk of global demand and value addition is located in components and sub-systems, where India's export presence remains limited.

Table 1: Comparison of India's Trade Profile for Electronics Trade, 2024

Code	Product label	World Imports ($bn)	Product Share in World Demand	India's Exports ($bn)	India's export share in World demand	India's Imports ($bn)	RCA India	RCA Competitor	Top Exporter and Volume ($bn)
'8542	Integrated circuits (chips)	1215.8	26.2%	0.3	0.02%	23.8	0.02	2.27	Hong Kong ($220)
'8517	Mobile phones and telecom equipment	635.3	13.7%	22.1	3.5%	17.6	3.83	1.69	China ($214.9)
'8471	Automatic data-processing machines and units	552.4	11.9%	1.0	0.2%	10.6	0.20	1.45	China ($160.7)
'8473	Parts and accessories of machines	185.8	4.0%	0.3	0.2%	2.9	0.20	0.92	China ($34.1)
'8544	Electric wires, cables and optical fibre	169.1	3.6%	2.2	1.3%	1.4	1.43	4.74	China ($31.3)

27 https://www.ibef.org/news/meity-targets-us-500-bn-electronics-production-by-2030-with-detailed-strategy

28 A country is said to have a revealed comparative advantage (RCA) in a given product i when its ratio of exports of product "i" to its total exports of all products exceeds the same ratio for the world as a whole. If RCA takes a value greater than unity, the country has a revealed comparative advantage in that product

Code	Product label	World Imports ($bn)	Product Share in World Demand	India's Exports ($bn)	India's export share in World demand	India's Imports ($bn)	RCA India	RCA Competitor	Top Exporter and Volume ($bn)
'8504	Power equipment (transformers & converters)	157.8	3.4%	3.0	1.9%	3.6	2.11	1.08	China ($46.4)
'8541	Semiconductors and LEDs	156.8	3.4%	1.8	1.1%	6.3	1.26	1.00	China ($48.1)
'8507	Batteries	149.0	3.2%	0.9	0.6%	3.6	0.64	1.56	China ($66.6)
'8536	Switches, plugs and circuit protection devices	127.6	2.8%	1.3	1.0%	2.8	1.11	1.88	China ($22.3)
'8524	Display panels and touchscreens	100.4	2.2%	0.1	0.1%	4.4	0.06	3.31	China ($45.3)
'8537	Electrical control panels and switchboards	96.2	2.1%	0.9	0.9%	1.1	1.03	5.95	Germany ($15.9)
'8528	TVs, monitors and projectors	87.8	1.9%	0.1	0.1%	1.0	0.09	2.57	China ($35.5)
	Total for top 12	**3634.0**	**78.4%**	**33.9**	**0.9%**	**79.1**			

Source: ITC Trade Map

Integrated circuits (HS 8542) dominate world imports, accounting for 26.2% of global electronics demand, yet India's presence is negligible, with an export share of just 0.02% and an RCA of 0.02. This reflects India's continued dependence on imports ($23.8 bn) for chips, and the global value chain being led by hubs such as Hong Kong, Taipei, China and South Korea. Automatic data processing machines and parts (HS 8471 and 8473) refers to another set of products which account for 12% and 4% respectively, of global demand and India holds a low share and RCA. The weak RCA indicates that India remains positioned largely as a weak supplier.

In contrast, mobile phones and telecom equipment (HS 8517) represent India's strongest foothold. With a product share of 13.7% in global demand, India has achieved a 3.5% export share, a big jump from 0.1% in global demand in 2015 and an equally high RCA of 3.83, exceeding that of major competitors. This suggests a clear revealed comparative advantage, driven by scale manufacturing, assembly-led integration, and policy support. Imports remain significant, indicating high import content, but the segment demonstrates India's ability to insert itself into large-volume, final-assembly–oriented value chains erstwhile dominated by China.

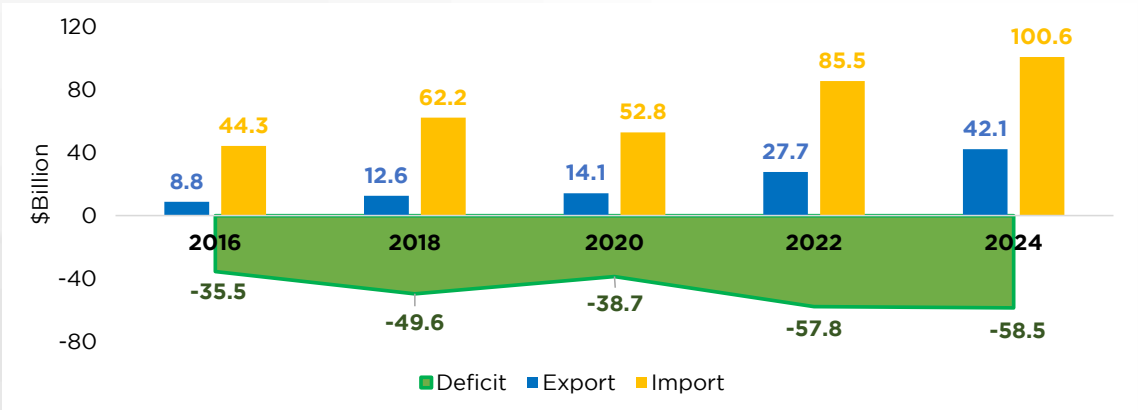
A second tier of products, electric wires and cables (HS 8544), power equipment such as transformers and converters (HS 8504), and electrical control equipment (HS 8536, 8537) shows moderate but meaningful competitiveness. These categories have lower global demand shares (2.5–4.4%) but India's export shares range from 0.9% to 1.9%, with RCAs around or above 1. This indicates capability in electro-mechanical and power-related equipment, where entry barriers are lower, domestic demand is strong, and supply chains are less technology-intensive.

Semiconductors and LEDs (HS 8541) account for a notable share of global demand, but India's export share remains modest at about 1.1%. An RCA ~1 suggests emerging capability, though the segment continues to be dominated by China due to high capital and technology intensity. Batteries (HS 8507), display panels (HS 8524), and TVs and monitors (HS 8528) underline structural gaps. Despite sizable global markets, India's export shares are below 1% and RCAs are below unity, while imports are high. Semiconductor fabrication[29], advanced displays, and batteries require high capital, long gestation periods, and deep technological capabilities. These segments are capital- and technology-intensive, with scale economies and strong incumbency effects, explaining China's dominance across most categories.

2. Mapping India's Trade Profile

India's electronics trade is also analysed at the HS-4 level. Total exports in this segment stood at $42.1 bn in 2024, while imports amounted to $100.6 bn resulting in a trade deficit of $58.5 bn The export basket is highly concentrated with the top five products together accounted for $30.4 bn representing about 72.3% of total exports in the category. In contrast, imports are also concentrated but skewed toward a different set of products, with the top five import items totalling $62.8 bn and accounting for roughly 62.4% of total imports in the category.

Fig 17: India's Exports and Imports of Electronics Products (2016 to 2024)



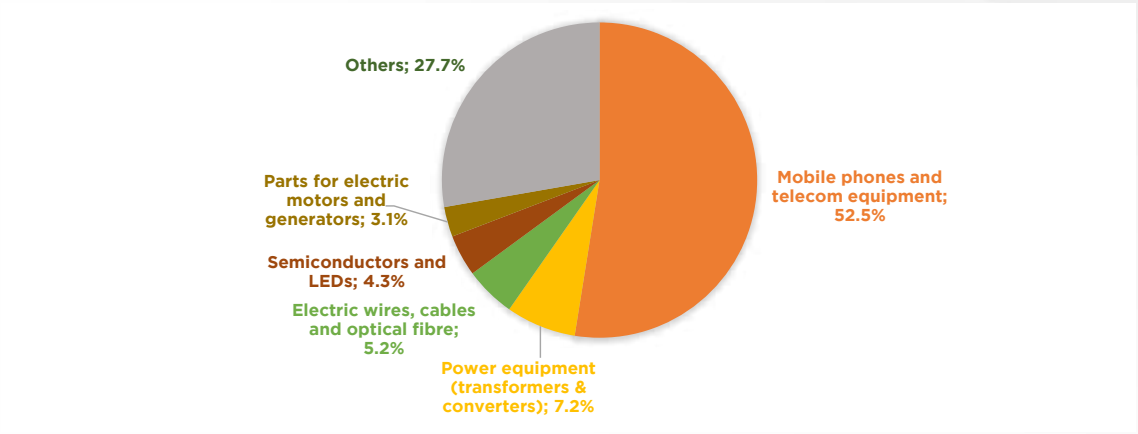
Source: ITC Trade Map

India's electronics trade structure is highly concentrated in smartphones on the export side and structurally dependent on imports for core components. Exports are overwhelmingly dominated by mobile phones (HS 8517), which alone account for 52.5% of the export basket, highlighting the assembly-led nature of India's

29 While individual states did have semiconductor plants set up before 2007, yet India adopted its first policy only in 2007 which saw limited success. In contrast, China had its first policy as early as the mid-1950's which allowed it to leverage the first-mover advantage.

integration into global electronics value chains. This concentration reflects scale-driven final manufacturing, where India has leveraged large global demand, cost competitiveness in assembly, and policy support to expand exports. Beyond mobile phones, the export basket thins out sharply. Power equipment such as transformers and converters (7.2%), electric wires and cables (5.2%), and semiconductors and LEDs (4.3%) form a secondary layer of exports, while parts for electric motors and generators contribute just over 3.1%. The remaining quarter of exports is fragmented across smaller product lines, indicating limited diversification into high-value or technologically complex electronics.

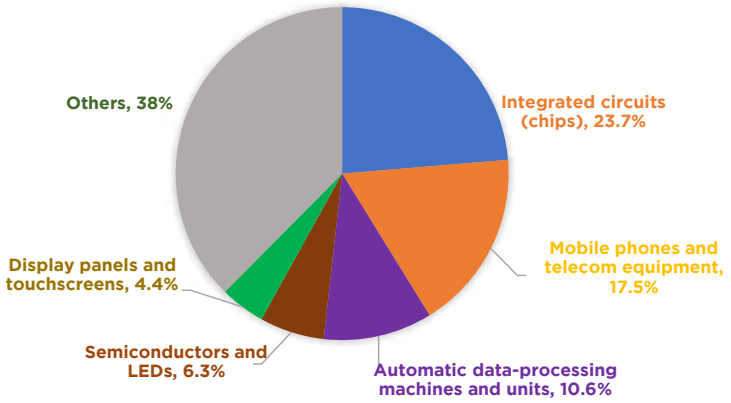
India's Top 5 Segment and their share in the Electronics Export Basket, 2024 (72% of export basket)



Source: ITC Trade Map

On the import side, the structure is almost the mirror image. Integrated circuits (HS 8542) dominate imports, accounting for 23.7% of the import basket, highlighting India's near-total dependence on external suppliers for chips which forms the foundational input for all electronic products. Mobile phones themselves account for 17.5% of imports, pointing to continued reliance on imported finished devices and sub-assemblies alongside domestic assembly. Semiconductors and LEDs (6.3%), display panels and touchscreens (4.4%), further reinforce the picture of import dependence in high-technology, capital-intensive segments.

Fig 19: India's Top 5 Segment and their share in the Electronics Import Basket, 2024 (62% of import basket)



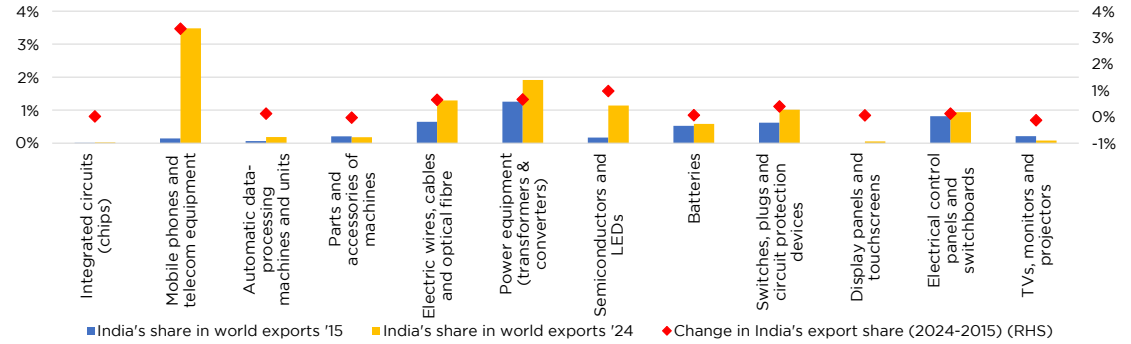
Source: ITC Trade Map

3. Composition of India's Electronics Exports Over Time (2015–24)

Between 2015 and 2024, global electronics demand has increasingly tilted toward a narrower set of component and technology-intensive products. Integrated circuits strengthened their dominance, with their share in world demand rising, gaining by 5.6% to 26.2% making chips the single largest driver of electronics trade. Batteries also saw a sharp rise in importance, with their share increasing from 1.2% to 3.2% reflecting the expansion of electric mobility and energy storage. Display panels and touchscreens emerged as a significant category, growing from virtually zero to 2.2% of world demand by 2024. Together, these shifts indicate that global demand growth has been concentrated in core components and enabling technologies rather than evenly spread across the electronics spectrum.

India's position in these fast-growing demand segments remains mixed. Despite chips accounting for nearly one-third of global electronics demand in 2024, India's export share in this category increased only marginally from 0.01% to 0.02%. A similar divergence is visible in batteries and displays, India's export shares increased by just 0.06% in batteries and 0.05% in displays.

Fig 20: India's Changing Share in Global Demand for Key Electronics (2015-24)



Source: ITC Trade Map

India's export gains have instead been concentrated in products where global demand growth was modest or declining by capturing newer markets. Mobile phones and telecom equipment illustrate this contrast clearly. While their share in world demand fell from 18.4% to 13.7%, India's export share rose sharply from 0.14% to 3.5%, a gain of 3.34%. This indicates that India's export growth in this category came primarily from capturing a larger slice of an existing market rather than from rising global demand expansion. Similar patterns, though on a smaller scale, are seen in electric wires and cables and in switches and circuit protection devices, where India gained export share despite stagnant global demand.

A partial alignment between global demand shifts and India's export performance is visible in power equipment and electrical control panels. Power equipment increased its share in world demand from 3% to 3.4%, while India's export share rose from 1.3% to 1.9%. Electrical control panels also saw modest increases on both fronts. These segments suggest that India has been able to expand where demand growth is incremental and supplier bases are relatively dispersed.

Finally, looking at products with the highest shares in the electronics segment underscores the structural divergence. Chips (26.2%) and mobile phones (13.7%) together account for nearly half of global electronics demand, yet India's export

presence is concentrated overwhelmingly in the latter. Batteries, displays, and semiconductors and LEDs are gaining prominence within the segment, but India's export shares in these remain at 1.2%. Overall, the evidence suggests a growing mismatch between the shift in global electronics demand toward input components and India's export gains, which remain concentrated in a few finished product segments.

4. Mapping Global Demand and India's Export Footprint in Key Electronics Segments

This overview maps global demand patterns and India's export footprint across key electronics segments by examining the alignment between major importing markets, dominant exporting economies, and India's principal export destinations. By identifying overlaps between importers and exporters, as well as concentration in demand and supply, the analysis situates India's electronics exports within the broader structure of global electronics value chains, distinguishing between processing hubs, production centres, and final consumption markets.

Table 2: Mapping Global Demand and India's Export Footprint in Top Electronics Segment

HS Code-Prodcut	World Demand (2024) ($bn)	India's Share in the World Exports (% Share)	India's Top Export Destinations (% share)	Major Global Exporters (Share in World Exports %)	Top Importers (%)
8542- Integrated circuits (chips)	1,215.8	0.02	Hong Kong (24.3), South Korea (22.8), Vietnam (13.5)	Hong Kong (20.9), Taipei, Chinese (15.7), China (15.2)	China (31.8), Hong Kong (18.7), Singapore (8)
8517- Mobile phones and telecom equipment	635.3	3.5	USA (33.4), UAE (11.7), Netherlands (11.4)	China (35.8), Vietnam (9.6), Hong Kong (9.4)	USA (18.1), Hong Kong (9.4), UAE (6.6)
8471- Automatic data processing machines and units	552.4	0.2	Russia (49.4), UAE (22.5), USA (6.6)	China (30.6), Taiwan (16.1), USA (7.6)	USA (25.6), China (10.2), Hong Kong (5.8)
8473- Parts and accessories of the machines	185.8	0.2	USA (24.8), Malaysia (12.8), China (9.7)	China (21), Hong Kong (17.4), USA (14.7)	USA (29.5), China (12.4), Hong Kong (11.6)
8544- Electric wires, cables and optical fibre	169.1	1.3	USA (19.7), UAE (10.6), UK (6.4)	China (18.2), Mexico (10.4), USA (7.3)	USA (18.9), Germany (8.8), Japan (5)
8504- Power equipment (transformers & converters)	157.8	1.9	USA (34.3), UK (6.1), Netherlands (5.6)	China (29.2), Germany (7.9), USA (5.1)	USA (18.9), Germany (8), China (6.5)
8541- Semiconductors and LEDs	156.8	1.1	USA (85.5), Bahrain (6.7), UAE (1.6)	China (33.5), Hong Kong (11.2), Singapore (7.9)	China (17), USA (14.9), Hong Kong (10.6)

Source: ITC Trade Map

Electronic Integrated Circuits (HS Code 8542): The electronics value chain in integrated circuits is characterized by a strong import–export overlap in East Asia. China (31.8%) and Hong Kong (18.7%) feature simultaneously among the largest importers and exporters (15.2% and 20.9%), indicating intensive cross-border circulation of intermediate goods within tightly linked production networks. Despite the scale of global trade ($1.2 tn), India's export presence remains marginal, with shipments largely directed toward Hong Kong and South Korea, reinforcing its peripheral position in this segment.

Telephone Sets (HS Code 8517): Unlike integrated circuits, trade in telephone sets shows a clearer separation between production hubs and consumption markets. China accounts for over one-third of global exports (35.8%), while the USA alone absorbs 18.1% of world imports. India's 3.7% share in global exports, with a significant concentration toward the USA (33.4%), suggests alignment with final demand markets rather than participation in regional processing trade.

Automatic Data Processing Machines (HS Code 8471): Trade in automatic data processing machines further highlights the dominance of East Asian manufacturing ecosystems. China commands 30.6% of global exports, while the USA emerges as the single largest importer (25.6%). India's export share is marginal (0.2%) and heavily skewed toward Russia (49.4%) and the UAE. The segment is characterized by concentrated global production and large-scale manufacturing systems.

Parts and Accessories of Office Machines (HS Code 8473): Parts and accessories trade is typically associated with deeper GVC integration due to its intermediate-goods nature. China (21%) and Hong Kong (17.4%) dominate exports, while the USA leads global imports (29.5%). India's export share remains modest (0.2%), with exports concentrated toward the USA and Malaysia. The limited scale of India's participation in this segment indicates that backward linkages into global electronics manufacturing chains remain underdeveloped, constraining spillovers into higher value-added activities.

Insulated Wires and Cables (HS Code 8544): Trade patterns in insulated wires are more geographically dispersed, reflecting their use across industrial and infrastructure activities. Export supply is led by China (18.2%), but with meaningful shares from Mexico and the USA, while import demand is concentrated in advanced industrial economies such as the USA and Germany. India's 1.3% export share, coupled with shipments toward these markets, indicates selective integration into input industrial supply chains.

Electrical Transformers and Static Converters (HS Code 8504): Power electronics exhibit a high degree of export concentration, with China alone supplying 29.2% of world exports. Import demand, however, is led by large consuming economies, particularly the USA (18.9%). India's participation is better (1.9% of global exports), and its strong reliance on the US market points to a narrow destination profile within this segment.

Semiconductor Devices (HS Code 8541): Semiconductor device trade reflects a combination of manufacturing concentration and market scale, with China dominating exports (33.5%) while also remaining a major importer. India's export footprint is small (1.2%) and highly concentrated, with over 85% directed to the USA, highlighting limited engagement with the core East Asian semiconductor trading ecosystem.

Across electronics segments, global trade is marked by a strong concentration of both demand and supply in East Asia and advanced industrial economies, with China and Hong Kong consistently occupying central positions as both major importers and exporters. India's export presence remains uneven and segment-specific, with relatively stronger participation in select electronics categories, while remaining marginal in semiconductor-intensive segments. The destination profile of India's exports, often concentrated in a few large consuming markets, highlights limited integration with core electronics production networks and underscores the structural nature of India's current positioning in global electronics trade.

Global Electronics Success Stories: Lessons from Leading Countries

I. Electronics Industry Front-Runners: China, Japan, and South Korea

- **Sustained and Coherent State-Led Industrial Strategy:** Japan's electronics success was built on long-term state leadership through MITI, which prioritized the sector, coordinated government–industry action, and steered firms toward high-technology production, turning Japan into a global electronics leader by the 1970s–80s. This approach has been revived through major semiconductor subsidies, support for TSMC's Kumamoto fabs, and the state-backed Rapidus consortium. China institutionalized a similar model through successive Five-Year Plans, notably the 13th Plan's innovation push and R&D spending of about 2.4% of GDP, and the 14th Plan's expansion of the digital economy and large-scale infrastructure such as 5G. South Korea followed a comparable path, combining early state direction with recent large-scale semiconductor support, including a $23 bn package to secure leadership in chips.
- **Sequential upgrading along the electronics value chain:** Japanese firms upgraded early from consumer electronics into semiconductors, electronic components, and eventually semiconductor manufacturing equipment and materials, segments where they still hold critical global market shares. South Korean firms moved from assembly and contract manufacturing in the 1970s to global leadership in DRAM (Dynamic Random-Access Memory), NAND, and advanced displays, and is now extending this trajectory toward chip design and system semiconductors through targeted R&D and skills programmes. Chinese firms moved from FDI-led electronics assembly in export-processing zones to systematic localisation of components, design, and advanced semiconductor manufacturing, supported by National Integrated Circuit funds. This upgrading has been reinforced by SEZ/FTZ duty and VAT suspensions, export VAT refunds, a 15% corporate tax rate for high-tech firms, tax holidays for chipmakers, and tariff exemptions on key semiconductor inputs.
- **Investment in manufacturing capacity and R&D:** Japanese and South Korean firms have consistently maintained high R&D intensity (around 2–4% of GDP), reinforced recently through public co-financing of advanced fabs and packaging facilities, while Chinese firms have increasingly combined manufacturing scale with R&D via state banks, local governments, and national semiconductor funds.

- **Development of dense industrial clusters and integrated ecosystems:** Japan's electronics clusters around Tokyo–Yokohama and Kansai integrate component suppliers, precision equipment firms, and research institutions, reinforcing technological depth. South Korea's concentration of semiconductor and display production in the Gyeonggi and Chungcheong regions enables tight coordination between fabs, suppliers, and public research bodies, supported recently by infrastructure investments in power, water, and logistics. China scaled clustering to an unprecedented level through regions such as the Pearl River Delta, Yangtze River Delta, and Bohai Rim, where thousands of specialised firms co-locate.

II. Emerging Electronics Powerhouses: Thailand, Malaysia, and Vietnam

- **Strategic Use of Scale, Trade, and Market Access:** Thailand leveraged deep integration into regional electronics value chains in Hard Disk Drives (HDDs) and components and is now extending this strategy into semiconductors through its National Semiconductor Roadmap (2025–2050), targeting THB 2.5 trillion in investments. Malaysia used early export-oriented industrialization and FTAs to embed itself as a global E&E and semiconductor hub, with electronics accounting for ~40% of exports. Vietnam combined trade liberalization, FTAs (CPTPP, EVFTA, RCEP), and export-processing zones to become the world's 5th-largest electronics exporter and 2nd-largest exporter of mobile phones, with electronics exports exceeding USD 134.5 bn in 2024.
- **From Assembly to Advanced Semiconductor Capabilities:** Malaysia's New Industrial Master Plan 2030 policy explicitly targets design, fabrication, and packaging, with a flagship objective to create globally competitive capabilities in strategic applications such as EVs, renewable energy, and AI, marking a move beyond traditional role in assembly and testing. Vietnam is following a phased semiconductor development strategy (2024–2050), initially leveraging FDI-led assembly and manufacturing to build scale and integration into global value chains, and subsequently prioritizing the development of domestic design, fabrication, and R&D capabilities to deepen local value addition over time.
- **Targeted Incentives and Cost Competitiveness:** Thailand offers targeted BOI incentives like corporate income tax holidays of up to 13 years, import duty exemptions on machinery and raw materials, and R&D-linked benefits tied to minimum investment thresholds. Malaysia attracts semiconductor investors with Pioneer Status (70% tax exemption up to 10 years) and Investment Tax Allowance (60% on capital expenditure for 5 years). Vietnam combines competitive labor costs with preferential corporate tax rates for high-tech enterprises (as low as 10%), extended tax holidays, and ready-to-use industrial and high-tech parks.
- **Focus on New Technologies and Future Electronics:** Thailand's roadmap prioritizes chip design, fabrication, packaging, and testing to establish a "Made-in-Thailand" semiconductor value chain. Malaysia is pushing into advanced semiconductor segments, including IC design and higher-end packaging, under NIMP 2030. Vietnam aims to establish 100 chip design firms, one fabrication plant, and 10 packaging/testing facilities by 2030, with a long-term goal of USD 100 bn turnover by 2050.

- **Cluster Development and Ecosystem Support:** All three countries promoted geographic concentration of electronics activity: Thailand through the Eastern Economic Corridor (EEC), Malaysia through mature clusters such as Penang's Bayan Lepas Free Industrial Zone, and Vietnam through large-scale industrial and hi-tech parks in Bac Ninh, Thai Nguyen, and Ho Chi Minh City facilitating supplier networks, logistics efficiency, and technology spillovers.

5. Assessing Domestic Performance of the Electronics Industry

The recent expansion of India's electronics manufacturing reflects both scale concentration and gradual broadening across segments. Mobile phones dominate the industry, with output rising from $30 bn in FY21 to $51 bn in FY24, accounting for 44.3% of total electronics manufacturing. This single segment has driven a large share of the overall increase from $74.7 bn to $115 bn, underscoring its role as the anchor of the sector's growth trajectory.

Beyond mobile phones, the manufacturing base is evenly spread but at much smaller scales. Consumer electronics including TVs, audio products, and accessories expanded from $9.5 bn to $13 bn, contributing 11.3% of total output. Industrial electronics such as power electronics, DC/AC converters and electronic components together account for roughly one-fifth of manufacturing, with industrial electronics at $ 12.5 bn (10.9%) and components at $ 10.5 bn (9.1%) in FY24. These segments indicate growing domestic demand from industry and infrastructure, though their combined scale remains well below that of mobile phones.

Table 3: Comparison of India's Domestic Production for Electronics, 2021-24

Product Segment	FY20-21 ($bn)	FY22-23 ($bn)	FY23-24 ($bn)	Proportion of Total
Mobile Phones	30.0	44.0	51.0	44.3%
Consumer Electronics (TV, Audio, Accessories)	9.5	12.0	13.0	11.3%
Industrial Electronics	10.5	12.0	12.5	10.9%
Electronic Components	9.0	10.0	10.5	9.1%
Auto Electronics	6.0	7.5	8.0	7.0%
Strategic Electronics	4.0	4.8	5.5	4.8%
IT Hardware (Laptops, Tablets)	3.0	4.5	5.0	4.3%
LED Lighting	2.2	3.0	3.5	3.0%
Telecom Equipment	-	2.0	3.5	3.0%
Wearables & Hearables	-	1.3	2.5	2.2%
Electronics Manufacturing (Total)	74.7	101	115	

Source: Ministry of Electronics & IT Annual Report

Auto electronics and strategic electronics show steady but moderate growth. Auto electronics increased from $6 bn to $8 bn, reflecting rising electronic content in vehicles, while strategic electronics which consists of military communication systems, radars and sonars, network centric systems, electronic warfare systems etc linked to defence and critical applications reached $5.5 bn, or 4.8% of total

manufacturing. IT hardware, including laptops and tablets, also expanded to $5bn, accounting for 4.3%, signaling diversification into computing hardware but from a relatively low base.

Newer and faster-growing segments are visible but still small in absolute terms. LED lighting rose to $3.5 bn, while telecom equipment and wearables emerged as identifiable manufacturing segments only after FY21, together contributing just over 5% of total output in FY24. Their growth points to emerging demand niches, but their limited scale highlights the early stage of capacity build-up.

Overall, the electronics industry remains highly concentrated, with mobile phones accounting for nearly as much output as the next six segments combined. However, the gradual expansion of mid-sized segments, such as industrial electronics, components, consumer electronics, and automotive electronics, signals an emerging opportunity for policy to deepen and diversify the manufacturing ecosystem beyond final assembly.

6. Comparative Tariff Structure: India, China and Vietnam

A comparison of import profiles across India, China, and Vietnam highlights stark differences in the scale across segments. China's imports are also overwhelmingly concentrated in integrated circuits, amounting to $386.7 bn in 2024. Vietnam follows a similar, though smaller, pattern with $62.9 bn of chip imports, underscoring its role as an assembly and export base within East Asian supply chains. India's chip imports, at $23.8 bn, are substantially lower in absolute terms, but still represent the single largest item in its electronics import basket, signaling a strong dependence on external suppliers for core components.

Table 4: India's Electronics Imports: Global Volumes and Tariff Comparison (2024)

Code	Product label	India's Imports in $bn (2024)	India's Average Tariff %	China's Imports in $bn (2024)	China's Average Tariff %	Vietnam's Imports in $bn (2024)	Vietnam's Average Tariff %
'8542	Integrated circuits (chips)	23.8	1.5	386.7	2.8	62.9	1.4
'8517	Mobile phones and telecom equipment	17.6	7.6	32.1	1.7	15.2	1.6
'8471	Automatic data-processing machines and units	10.6	0	56.5	3.7	4.8	1.4
'8473	Parts and accessories of machines	6.3	8.3	25.4	2.4	4.7	1.4
'8544	Electric wires, cables and optical fibre	4.4	NA	39.9	NA	16.5	NA
'8504	Power equipment (transformers & converters)	3.6	13.3	0.7	4.4	3.9	3.8
'8541	Semiconductors and LEDs	3.6	8.6	3.1	11.2	3.8	8.4
'8507	Batteries	3.1	2.1	25.5	2.6	2.9	1.4
'8536	Switches, plugs and circuit protection devices	2.8	8	12	5.7	4.3	13.7

Code	Product label	India's Imports in $bn (2024)	India's Average Tariff %	China's Imports in $bn (2024)	China's Average Tariff %	Vietnam's Imports in $bn (2024)	Vietnam's Average Tariff %
'8524	Display panels and touchscreens	1.4	9.1	5	6.8	3.5	7.8
'8537	Electrical control panels and switchboards	1.1	11.8	5.6	7	1.6	7.4
'8528	TVs, monitors and projectors	1	14.7	0.7	13.4	1.4	12.1
	Total	**79.3**	**7.7**	**593.2**	**5.6**	**136**	**5.5**

Note: Rates highlighted in red indicate the highest rate within each category and NA refers to data not available
Source: ITC Trade Map

The tariff structure reveals a clear divergence in approach. India's average tariffs across electronics imports are consistently higher than those of China and Vietnam, particularly in power-related segments. For example, mobile phones and telecom equipment attract an average tariff of 7.6% in India, compared to 1.7% in China and 1.6% in Vietnam, even as India imports $17.6 bn worth of these products. Similarly, power equipment faces tariffs of 13.3% in India, against 4.4% in China and 3.8% in Vietnam, despite India's imports being comparable in size to Vietnam's. This suggests a more protective stance in these segments.

In component-heavy categories such as semiconductors and LEDs, switches, and batteries, India again applies higher tariffs than its peers, despite importing smaller volumes. Semiconductors and LEDs, for instance, face an average tariff of 8.3% in India, compared to 2.4% in China and 1.4% in Vietnam. This contrasts with China's much larger import volumes ($25.4 bn) and Vietnam's ($4.7 bn), where lower tariffs facilitate high-throughput integration into global value chains. Batteries are an exception where China's tariffs are relatively high (11.2%), reflecting its strategic control over battery supply chains, while India and Vietnam apply similar rates around 8–9%.

Display panels and touchscreens stand out as a structurally import-dependent segment across all three economies, with large import volumes and no effective tariff protection (NA across countries). China's imports of $39.9 bn and Vietnam's $16.5 bn dwarf India's $4.4 bn, reinforcing the concentration of display manufacturing in a few global hubs.

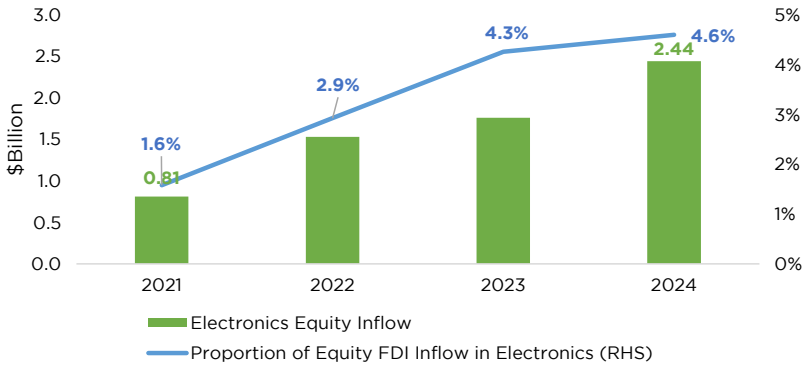
Overall, the comparison points to two key structural insights. First, India's electronics imports are smaller in scale but more tariff-protected than those of China and Vietnam. High import tariffs on mobile phones, for instance, has helped foster a domestic ecosystem for finished products due to the scale of the domestic market but this approach has not helped for components primarily because it is multi-staged involving global integration and higher tariffs hamper participation. Second, China and Vietnam maintain relatively low tariffs in high-volume component segments, enabling seamless participation in dense supply chains. India's higher tariff regime, combined with a narrower import base, suggests a more domestic market orientation, even as import dependence on critical inputs like chips and displays remains unavoidable. This configuration has shaped the pattern of foreign investment in the sector, with multinational firms responding to policy incentives and market scale by anchoring

final assembly and manufacturing operations in India, while component production continues to be largely sourced from global hubs.

7. Foreign Investment[30] Trends in the Electronics Industry

India has rapidly evolved into a key destination for electronics manufacturing, supported by a sharp rise in investment inflows and a near six-fold expansion in production over the past decade. Anchored by the objective of developing a $500 bn electronics manufacturing ecosystem by 2030–31, the sector has increasingly attracted foreign capital alongside domestic investment, strengthening India's role in global technology supply chains. This momentum is reflected in export outcomes: in 2024, Apple's [31] exports from India reached a record ₹1,10,989 crore ($12.8 bn), surpassing the ₹1 lakh crore threshold and registering 42% year-on-year growth. The expanding manufacturing ecosystem has drawn in global OEMs as well as domestic firms, deepening foreign investment linkages and embedding India more firmly within the global electronics value chain.[32]

Fig 21: FDI in electronics and components industry (2021-24)



Source: DPIIT

Despite domestic electronics production rising sharply from ₹5.54 lakh crore in FY21 to ₹9.52 lakh crore in FY25, India still does not manufacture mobile phones end-to-end. A large share of critical components continues to be imported, with final assembly carried out across more than 300 manufacturing units in India for both domestic consumption and exports. This structural gap is being addressed through the Electronics Components Manufacturing Scheme (ECMS).

India's success in attracting leading mobile phone manufacturers like Apple and Samsung should be replicated across other segments to draw in top-tier suppliers, enabling the creation of large-scale operations. This is especially important for component manufacturing, where long gestation periods and high capital requirements mean that only large suppliers can afford to defer returns over extended timelines[33].

30 Foreign Direct Investment comprises of the sum of Equity Inflow, Reinvested Earnings and Other Capital, we have analyzed only FDI Equity Inflow. FDI Equity Inflow forms the major component.

31 Apple's contract manufacturers, Foxconn, Tata Electronics, and Pegatron along with Samsung and Dixon Technologies, emerged as the principal beneficiaries of the electronics PLI scheme, establishing manufacturing facilities and scaling up production of Made-in-India mobile phones. The five-year PLI framework enabled these firms to build domestic manufacturing capabilities by offsetting initial scale and cost disadvantages. Foxconn and Dixon have now announced investment plants in India.

32 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2177755&reg=3&lang=2

33 https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon_0.pdf

The approved ECMS in October, 2025 signal a renewed policy push to deepen India's electronics value chain and reduce dependence on imported inputs. The scheme reflects the government's focus on building domestic capabilities in 11 high-value components that are essential for sustaining large-scale electronics manufacturing. Specifically, ECMS targets components such as printed circuit boards (PCBs), camera module sub-assemblies, copper-clad laminates, and polypropylene films, which form the backbone of modern electronics production. The initial tranche of applications under ECMS indicates strong participation from leading domestic and global manufacturers, pointing to growing industry readiness to invest in input capabilities.

Leveraging India's Electronics Strengths in the EU Market

The table below highlights the European Union as a large and high-value import market for a selected set of electronics products under HS-85, with combined imports of $344.8 bn across product categories in which India already demonstrates revealed comparative advantage (RCA > 1).

Table 5: India-EU Electronics Opportunity (2024)

Code	Product label	World Imports ($bn)	EU Imports ($bn)	EU Share in World Demand	India's Exports to EU ($bn)	RCA India	Export Opportunity in the EU Market ($bn)
'8517	Mobile phones and telecom equipment	635.3	146.6	23%	7.56	3.83	139.05
'8544	Electric wires, cables and optical fibre	169.1	55.6	33%	0.37	1.43	55.19
'8504	Power equipment (transformers & converters)	157.8	46.1	29%	0.54	2.11	45.52
'8536	Switches, plugs and circuit protection devices	127.6	37.7	30%	0.30	1.11	37.38
'8537	Electrical control panels and switchboards	96.2	31.4	33%	0.10	1.03	31.33
'8541	Semiconductors and LEDs	156.8	27.5	18%	0.01	1.26	27.47
Total		**1342.8**	**344.8**		**8.88**		**335.94**
	Total (Segment)		**752.5**		**11.27**		

Source: ITC Trade Map

Mobile phones and telecom equipment (HS 8517) account for USD 146.6 bn of EU imports, while other segments such as electric wires, cables and optical fibre, power equipment including transformers and converters, and switches and circuit protection devices also exhibit substantial and sustained import demand. These product groups are integral to the EU's consumer electronics, industrial machinery, and energy-transition value chains. India's exports to the EU across these six product categories total only $8.88 bn against an export

opportunity of nearly $336 bn in the EU market. The gap is most pronounced in mobile phones and telecom equipment, where India captures just $7.56 bn despite a potential exceeding $139 bn, and in power equipment and electrical components, where exports remain below $1 bn even as EU demand remains substantial.

The coexistence of strong EU import demand and India's revealed comparative advantage in these segments indicates a high degree of alignment between EU market requirements and India's existing production and export capabilities. India has already established a presence in global markets for these products, supported by scale manufacturing, improving component ecosystems, and competitive cost structures. However, India's exports to the EU remain limited relative to the size of the market, suggesting that current trade flows do not fully reflect India's underlying competitiveness.

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India's rapid scale-up in mobile phone manufacturing and exports supported by the PLI and PMP frameworks and large manufacturing clusters demonstrates its ability to integrate into global electronics value chains. India has emerged as the world's second-largest mobile phone manufacturer and exporter, supplying major international markets. Building on this strength, semiconductors and electronic components represent a natural next frontier, particularly as the EU intensifies its focus on technological sovereignty under initiatives such as the EU Chips Act. Growing EU demand from automotive electronics, renewable energy, and industrial applications creates scope for India to expand into assembly and testing (OSAT/ATMP), power electronics, and component manufacturing, supported by regulatory cooperation and standards alignment, enabling deeper India–EU integration across electronics segments.

With the conclusion of the India–EU Free Trade Agreement, this gap presents a clear opportunity. Reduced trade barriers, improved regulatory cooperation, and greater certainty for investors can enable Indian firms to extend their established global competitiveness into the EU market. Over time, this could support deeper integration of Indian manufacturers into EU-centric value chains and facilitate a gradual expansion of India's share in these high-value electronics imports.

The United States and the EU together account for a substantial share of global demand in the electronics sector, with a combined market size of approximately $ 1.6 tn. This represents around one-third of total global electronics demand, highlighting the strategic importance of these markets for India's electronics export ambitions. At present, the US imports electronics largely from countries such as China, Mexico, Vietnam, Malaysia, and Thailand. However, reciprocal tariff

rates applied by the US on these suppliers remain higher than those imposed on India, around 20% on China and Vietnam, 25% on Mexico, and nearly 19% on Thailand, compared to a relatively lower tariff rate of 18% for India. This relative tariff advantage improves India's cost competitiveness and presents a timely opportunity for Indian electronics manufacturers to scale up exports and deepen their penetration into the US and EU markets, thereby capturing a larger share of global electronics trade.

8. Manufacturing and Technology Enablers for India's Integration in Electronics

Deeper integration into global electronics value chains depends not only on final assembly, but on the development of core technological capabilities in key input segments. Printed circuit boards (PCBs), semiconductors, and battery management systems (BMS) constitute the foundational building blocks that determine value addition, supply-chain resilience, and competitiveness. Strengthening domestic capacity in these segments is therefore central for upgrading India's position in electronics manufacturing.

PCBs provide the essential mechanical framework and interconnections, ensuring that these complex circuits function reliably and efficiently. Semiconductors enable processing, computation, and signal control across applications from consumer electronics to industrial machinery. In battery-powered devices, particularly electric vehicles and portable electronics, BMS is critical for regulating charge, ensuring safety, and extending battery life. Together, these three components represent the core technological enablers without which devices cannot operate, making them indispensable for both manufacturing and global integration into electronics value chains.

a. Printed Circuit Board Design (PCB)

Participation in electronics value chains requires domestic capabilities in product and process design, particularly in PCB layout, system architecture, and manufacturing engineering. Countries that have developed PCB design and fabrication ecosystems are able to internalise process knowledge, meet international quality standards, and integrate more effectively into tier-1 supplier networks. PCBs are a foundational input in electronics manufacturing, with the global PCB market valued at $73 bn in 2024 and 50–60% of global capacity concentrated in China, highlighting their strategic role in global value chains. In India, PCB demand reached $4.2 bn in 2024–25, yet nearly 88% of bare PCBs worth $3.7 bn were imported, exposing a major supply-chain vulnerability despite strong domestic electronics production.

Local PCB manufacturing remains limited at $600 mn, even as domestic sourcing has grown at a robust 27.3% CAGR over the past three years, reflecting rising demand from mobile phones, IT hardware and consumer electronics. Scaling PCB production to $14 bn by 2029–30, about 10% of India's $150 bn electronics output target, is therefore critical for reducing import dependence, enhancing value addition, and generating 20,000 direct and 75,000 indirect jobs through ecosystem development.[34]

34 Electronic Industries Association of India-Feedback Advisory report

b. Semiconductors and Electronic Components

A major entry barrier for India into electronics GVCs is its reliance on imported components and semiconductors. India imports roughly 90–95 % of its semiconductor and component needs, from China, Taiwan, South Korea, and Singapore as on 2023[35], which have deep component ecosystems that support high value-added exports. India has attracted semiconductor suppliers since its semiconductor mission launched in 2021 and was also among the top six beneficiaries of U.S. trade policy–driven supply-chain shifts, alongside economies already embedded in GVCs. India, Malaysia, and Singapore are emerging as key destinations for new semiconductor investments, particularly in assembly, testing, and packaging.[36] The announcement of the Electronics Component Manufacturing Scheme has also strengthened this trend by incentivising input suppliers and improving ecosystem viability, signalling early but tangible supplier onshoring rather than mere trade diversion.[37]

c. Energy Storage and E-Mobility Systems

Electronics value chains are increasingly shaped by demand for power electronics, battery management systems, and control software associated with electric mobility and energy storage. The demand for Battery Management Systems (BMS) is driven by the increasing adoption of electric vehicles, advancement in battery technologies and the rising demand for efficient energy storing solutions. BMS segmentation by application remains dominated by electric vehicles, followed by renewable energy equipment's and then by consumer electronics in India.[38] While EVs continue to dominate BMS demand, applications in renewable energy equipment and, increasingly, consumer electronics further broaden the scope of opportunities within India's electronics value chains.

Along with above, rare earth elements are also critical inputs for semiconductors, electric vehicles, renewable energy systems and defence electronics, and remain subject to significant global supply-chain concentration. China currently accounts for nearly 70% of global mining and over 90% of processing capacity[39], creating recurring bottlenecks[40] that have spillover effects across downstream electronics value chains. Despite holding nearly 8% of global rare-earth reserves, India contributes less than 1% to global production.[41] Recognizing this vulnerability, the Union Budget 2026–27 has announced Dedicated Rare Earth Corridors across Odisha, Kerala, Andhra Pradesh and Tamil Nadu, aimed at strengthening domestic mining, processing and manufacturing capabilities.[42]

Taken together, the expansion of PCB manufacturing, semiconductor and component ecosystems, and energy storage–e-mobility systems underscores that India's deeper integration into electronics global value chains will ultimately be determined by its ability to build and sustain a skilled workforce aligned with

35 https://www.trade.gov/market-intelligence/india-semiconductor-and-electronics-industry
36 https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=12465&lid=7619
37 https://carnegieendowment.org/research/2025/08/indias-semiconductor-mission-the-story-so-far?lang=en
38 https://www.kenresearch.com/industry-reports/india-battery-management-market
39 https://www.csis.org/analysis/chinas-new-rare-earth-and-magnet-restrictions-threaten-us-defense-supply-chains
40 In April 2025, China further tightened controls by restricting exports of seven rare-earth elements and related compounds and magnets which have escalated in October, 2025.
41 https://www.orfonline.org/expert-speak/rare-earths-armistice-india-s-shift-from-mining-to-processing
42 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2222413&reg=3&lang=1

these emerging capabilities. As the sector moves from import dependence towards higher domestic value addition, skill requirements will increasingly span advanced design and engineering, precision manufacturing, quality assurance, and system integration across electronics, automotive, and energy domains. Addressing these needs will require a coordinated skilling strategy aligned with ongoing skilling initiatives, that goes beyond basic assembly skills, focusing instead on industry-linked training, curriculum modernisation, hands-on exposure to advanced tools and processes, and close collaboration between industry, training institutions, and government. Strengthening this skills backbone will be critical not only for scaling domestic production and attracting global suppliers, but also for ensuring long-term competitiveness, resilience, and employment generation within India's electronics manufacturing ecosystem.

9. Recent Developments in India's Trade Policies: Key Updates for the Electronics Sector

- **The Electronics Component Manufacturing Scheme (ECMS)[43]:** Launched in 2025 with a total outlay of ₹22,919 crore, the scheme aims to attract both domestic and global investment, promote higher domestic value addition, reduce import dependence on critical components and materials, integrate Indian manufacturers into global value chains, and support the growth of sectors like mobile, telecom, automotive electronics. The scheme offers differentiated incentives to manufacturers of key components and sub-assemblies (such as PCBs, camera modules, laminates, and films), with a tenure of six years (plus a one-year gestation period), and is expected to significantly expand India's electronics production capacity, employment, and exports. The Union Budget 2026–27 has announced an increase in the outlay for the ECMS to ₹40,000 crore, signalling a strong policy push to deepen domestic manufacturing capacity[44].
- **Export Incentive Extensions via Postal Mode[45]:** The Central Board of Indirect Taxes & Customs (CBIC) amended the Postal Export (Electronic Declaration and Processing) Regulations to allow exporters to claim key export benefits like Duty Drawback, RoDTEP and RoSCTL, on shipments via postal services from 15 January 2026, boosting competitiveness for MSMEs, is particularly impactful for the electronics sector, India's leading e-commerce export, by reducing logistics-related overhead for high-demand components and consumer devices.
- **Customs Duty Rationalization[46]:** In the Union Budget 2025-26, the Government of India revised customs duties to strengthen domestic electronics manufacturing and correct duty distortions: it increased the Basic Customs Duty (BCD) on Interactive Flat Panel Displays (IFPDs) from 10% to 20%, while reducing the BCD on open cell panels and related display components to 5% to rectify inverted duty structures and support local production competitiveness in the electronics value chain.
- **Targeted Customs Duty Reductions on Mobile & Electronic Parts:** The Union Budget 2026-27 announced exemptions on basic customs duty for certain inputs

43 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2183028&reg=3&lang=2
44 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2222519&reg=3&lang=1
45 https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2215141&lang=2&reg=3
46 https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2098364&lang=2

used in the manufacture of microwave ovens[47] and in the Budget 2024-25, the Government reduced the Basic Customs Duty (BCD) on mobile phones, mobile PCBA and chargers to 15% to support domestic production and consumer affordability, while proposing exemptions on certain inputs (e.g., oxygen-free copper for resistors and connector parts) to promote local component manufacturing[48].

- **The India Semiconductor Mission (ISM)[49,50]:** Approved in 2021 with a ₹76,000 crore outlay, ISM supports semiconductor fabrication, design, and manufacturing. Between 2023 and 2025, 10 projects with ~₹1.60 lakh crore investment across six states were approved, and India's first advanced 3-nm chip design centers were inaugurated in Noida and Bengaluru. The SEMICON India platform complements ISM by mobilizing global industry participation, fostering partnerships, skills, and innovation, with SEMICON India 2025 set to further highlight India's growing role in the global semiconductor value chain. A provision of Rs. 1,000 crore has been made for ISM 2.0 for FY 2026–27 in budget, with a strong emphasis on industry led research and training centres to drive technology development and create a future ready skilled workforce[51].
- **Design Linked Incentive (DLI) Scheme[52]:** Launched as part of the Semicon India Programme, the scheme is catalyzing India's semiconductor chip design ecosystem by providing targeted financial incentives and access to advanced design infrastructure to startups, MSMEs and domestic companies. As of January 2026, the scheme has supported 24 DLI-backed chip design projects across strategic areas such as video surveillance, energy metering, satellite communications and IoT SoCs, leading to 16 tape-outs, 6 ASIC chips, 10 patents, and engagement of over 1,000 specialized engineers, while leveraging more than three times private investment, strengthening India's indigenous semiconductor design capabilities and reducing dependency on imports.
- **Electronics Manufacturing Clusters Scheme (EMC 2.0, 2020)[53]:** Aims to build world-class industrial clusters with common facilities like plug-and-play infrastructure and ready factory sheds. As of 2025, 11 EMCs and 2 Common Facility Centres (CFCs) covering ~4,400 acres have been approved across 10 states, with projected investment of ₹1.46 lakh crore and an estimated ~1.80 lakh jobs expected to be generated. This cluster-based approach supports supply-chain responsiveness, cost-efficient logistics, and skill development while enabling manufacturers to scale production efficiently.
- **Production Linked Incentive (PLI) Scheme for Large Scale Electronics Manufacturing[54]:** Notified on 1 April 2020 to boost domestic manufacturing and attract investment across the mobile phones value chain, including

47 https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2222519&reg=3&lang=2#:~:text=Customs%20and%20Sur-charge%20Exemptions,Conclusion
48 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2035581
49 https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155130&ModuleId=3&reg=3&lang=2
50 https://www.pib.gov.in/FactsheetDetails.aspx?Id=149242&reg=3&lang=2
51 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2224839&reg=3&lang=1#:~:text=For%20 2026%E2%80%9327%2C%20the%20Modified,outlay%20of%20%E2%82%B98%2C000%20crore.
52 https://www.pib.gov.in/PressNoteDetails.aspx?id=156811&NoteId=156811&ModuleId=3&reg=3&lang=2
53 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2205046&reg=3&lang=2
54 https://www.pib.gov.in/PressReleseDetail.aspx?PRID=2115171&lang=1

specified electronic components and semiconductor packaging. The scheme provides incentives of 3%–6% on incremental sales (over the base year) of goods manufactured in India for a five-year period, covering mobile phones and key components. Budgetary allocation for electronics under the PLI Scheme increased sharply from ₹5,747 crore (RE 2024–25) to ₹8,885 crore in 2025–26, underlining the government's commitment to scaling up electronics manufacturing and exports.

10. Industry Insights on Strengthening India's Electronics Trade Performance[55]

India's electronics sector has emerged as one of the fastest-growing segments within manufacturing, driven by strong domestic demand, expanding assembly capacity, and targeted policy support through production-linked incentives (PLIs). India has made significant progress in mobile phone assembly, consumer electronics, and select electronic components, positioning itself as an increasingly important node in global electronics value chains. However, despite these gains, India's electronics exports continue to lag its production growth, reflecting structural and policy constraints that limit scale, value addition, and global competitiveness. There is a need for further strengthening of the broader electronics ecosystem to sustain export competitiveness over the medium to long term. The key insights and recommendations emerging from these discussions are summarized below.

- **Mismatch Between Product Life Cycles and Re-import Repair Eligibility:** Electronics products typically have operational life cycles of up to 15 years, India's customs framework permits re-import of exported goods for repair only within seven years of export. As a result, returns and repairs beyond this period are not allowed under the current policy framework.[56] The gap between product life cycles and repair eligibility highlights the need to better align trade policy with the lifecycle characteristics of electronics products.
- **Tax Treatment of Raw Materials in Battery Manufacturing:** India's battery manufacturing sector faces a structural cost disadvantage because VAT/GST paid on imported raw materials is not refundable. This raises effective input costs and discourages investment in local production. In contrast, countries like China have separate policies that allow refunds or rebates on such taxes, thereby lowering costs and making their manufacturers more competitive. Exploring a similar mechanism could significantly improve the economics of battery manufacturing, strengthen the domestic supply chain, and align with national priorities on electric mobility and energy storage.
- **Scaling Constraints and the Need to Build a Complete Electronics Ecosystem:** Despite recent investments, India's electronics ecosystem remains fragmented, with limited domestic depth in components, tooling, materials, and precision manufacturing. Stakeholders emphasized that scale economies critical for global competitiveness cannot be achieved through isolated firm-level incentives alone. Instead, coordinated ecosystem development is required, including supplier clustering, shared testing and certification infrastructure, reliable logistics,

55 A stakeholder knowledge-sharing session was held to gather industry insights on challenges and strategies for boosting India's global competitiveness in the electronics exports.

56 https://economictimes.indiatimes.com/industry/cons-products/electronics/finance-ministry-relaxes-norms-for-import-of-exported-electronic-goods-for-repairs/articleshow/65782539.cms

and access to skilled labour. Unlike China, Korea, and Taiwan, where dense industrial clusters support rapid scale-up and cost reduction, India's electronics manufacturing remains geographically dispersed, limiting productivity spillovers and supplier learning.

- **Skilling for High-Technology Manufacturing and Global Quality Standards:** One of the most pressing structural requirements for India's electronics sector is the development of a highly skilled workforce aligned with global quality and manufacturing standards. As India moves up the electronics value chain from assembly to design-led and high-precision manufacturing, there is a growing need for specialized skills in high-technology domains such as chip design, embedded software, system integration, and advanced product testing[57]. India targets USD 500 bn in electronics manufacturing output and around 6 mn jobs by FY2030[58]. Achieving this ambition requires deeper integration into global value chains (GVCs), which depends not only on scale and cost competitiveness, but critically on consistent adherence to global quality certifications and Six Sigma–level process discipline[59], supported by advanced skill availability across design, manufacturing, and testing functions.
- **Addressing Cost Competitiveness in Electronics Manufacturing:** To enhance India's competitiveness in global electronics value chains, it is essential to systematically reduce the cumulative cost disadvantage in electronics assembly and component manufacturing, which currently ranges from 10–14% and 14–18% respectively, compared to global peers such as China and Vietnam. Higher input tariffs and material costs result in a 5–6% cost disadvantage in assembly and 4–5% in components, while logistics inefficiencies add another 2–3%. The high cost of capital is a major binding constraint, with financing costs in India typically ranging between 9–13%, compared to 2–7% in competitor economies[60]. While India benefits from relatively lower labour and utility costs, aligning these advantages with capex subsidies, tax incentives, and R&D support will be critical to offset residual cost disadvantages.
- **Building Testing, Certification, and Capability Centres:** To accelerate India's integration into global electronics value chains, there is a strong need to expand internationally benchmarked testing, certification, and capability centres within India. Establishing and scaling advanced laboratories—on the lines of globally recognised facilities such as UL would allow electronics products to be tested, validated, and certified domestically against international standards. Strengthening NABL- and BIS-aligned labs, alongside MeitY-supported Common Facility Centres and private global certification players would significantly reduce time-to-market, regulatory compliance costs, and dependence on overseas testing facilities, which currently add delays and expenses for exporters.
- **Correcting Inverted Duty Structures:** India needs to enable domestic manufacturing of electronics capital equipment by addressing the inverted duty incidence on inputs and components used in their production. While capital equipment for electronics manufacturing is often imported at zero customs duty,

57 https://globalskills.ficci.in/past/2023a.pdf
58 https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon_0.pdf
59 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2124620&reg=3&lang=2
60 https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon_0.pdf

several critical inputs, parts, and sub-parts attract duties in the range of 5% to 25%. This inverted duty structure raises production costs for domestic manufacturers and discourages localization of critical sub-assemblies. Addressing this distortion through duty rationalization support the long-term competitiveness of India's electronics manufacturing ecosystem.

- **Market Access, Ease of Doing Business and Government Procurement**: Industry stakeholders emphasised that improved market access and a stable, predictable regulatory environment are essential for scaling electronics manufacturing. While ease of doing business has improved, firms, particularly MSMEs, continue to face challenges related to approvals, customs clearances, certifications, and compliance costs. Government procurement was identified as a critical lever to create assured demand, especially for domestic firms that lack global scale or established buyer relationships. Streamlining procurement norms, improving transparency, and providing forward visibility on public demand can help domestic manufacturers build scale and credibility.
- **Export Support and Financing Constraints**: Fiscal support mechanisms remain central to export competitiveness in electronics. Stakeholders noted that schemes such as RoDTEP and GST reimbursements are important, but budgetary constraints may reduce their effectiveness. To address financing gaps, industry participants suggested expanding sector-specific export financing instruments, including Lines of Credit and trade finance facilities, to support capacity expansion and overseas market entry. Credit enhancement and guarantee mechanisms were also highlighted as critical to improving MSME access to formal finance.
- **Integration into Global Value Chains (GVCs) and Anchor Investments**: Deeper integration into GVCs was identified as a strategic priority for the electronics sector. Stakeholders highlighted that attracting global and well-established international brands to manufacture in India would accelerate technology transfer, improve quality standards, and create sustained demand for domestic suppliers, including MSMEs. Such investments can generate spillover benefits across the supply chain, facilitating skill upgrading, and integration of small firms into global networks.

11. Way Forward

The deliberations highlight that India's electronics sector stands at a pivotal juncture, while domestic demand, assembly capacity, and production-linked incentives have driven rapid growth, export performance continues to lag due to structural gaps, cost disadvantages, and fragmented ecosystem development. Sustaining export momentum and enhancing global competitiveness will require a coordinated strategy that aligns industrial capabilities, fiscal support, market access, and skill development with long-term ecosystem strengthening. The following priority actions are recommended:

- **Industrial Policy and Ecosystem Development**
  - » **Increase domestic value addition:** Reorient incentive frameworks to explicitly reward production of critical components, sustained R&D investment, and end-to-end supply-chain integration.

  - » **Strengthen industrial clusters:** Develop electronics manufacturing clusters with shared testing, certification and reliability labs (EMC, safety, environmental testing), and other necessary facilities to reduce compliance costs and shorten product cycles.
  - » **Strengthen high-technology skills:** Create targeted skilling programs in chip design, embedded software, system integration, and advanced product testing to meet global standards and support the USD 500 bn electronics manufacturing target by FY2030.

- **Cost Competitiveness and Fiscal Measures**
  - » **Reduce structural cost disadvantages:** Rationalize input tariffs, correct inverted duty structures, and address logistics inefficiencies to narrow the 10–18% cost gap vis-à-vis global competitors.
  - » **Lower input costs for strategic components:** Introduce VAT/GST refunds or rebates on imported raw materials to support battery and critical component manufacturing and incentivize domestic capacity creation.
  - » **Deliver coordinated fiscal support:** Integrate capex subsidies, tax incentives, and R&D support with labor and utility cost measures to enhance overall manufacturing competitiveness.
- **Market Access, Export Support, and Global Integration**
  - » **Streamline compliance and procurement:** Simplify regulatory approvals, certifications, and customs procedures, and leverage public procurement to provide predictable demand for domestic manufacturers.
  - » **Scale export finance mechanisms:** Expand sector-specific export credit, Lines of Credit, and guarantee instruments to support MSMEs and facilitate capacity expansion in overseas markets.
  - » **Deepen global value-chain integration:** Attract anchor investments from global firms for components in the ecosystem to enable technology transfer, improve quality and standards, and generate sustained demand for domestic suppliers.

C.
POLICY AND GEOPOLITICAL HIGHLIGHTS

C. Policy Highlights

1. Global Trade–Related Policy Updates

- **EU–Mercosur Free Trade Agreement Progress**[61]**:** On January 17, 2026, the European Union and the Mercosur bloc (Argentina, Brazil, Uruguay, and Paraguay) formally signed a long-anticipated free trade agreement, concluding over 25 years of negotiation. The pact aims to eliminate tariffs on approximately 92–93% of goods traded between the two blocs, creating one of the world's largest free trade zones covering 700+ mn consumers and significant shares of global GDP, though it still requires ratification by member legislatures.
- **China's Export Tax Rebate Adjustments**[62]**:** In early 2026, China announced significant changes to its export tax rebate regime, removing or reducing value-added tax rebates on hundreds of product categories, including photovoltaic and battery goods, effective from April 1, 2026, with full elimination for some items by January 1, 2027.

2. India's Trade Policy Developments

- **India-EU trade agreement signing scheduled:** The India–EU FTA integrates two major economies that together account for ~25% of global GDP and one-third of global trade, granting India duty-free access for over 99% of exports by value and significantly boosting goods, services, and mobility linkages was signed on 27th January 2026.
- **India-UAE Trade & Strategic Expansion**[63]**:** On 19 January 2026, during an official state visit to New Delhi by UAE President Sheikh Mohamed bin Zayed Al Nahyan, India and the UAE formally agreed on measures to expand and deepen their economic partnership. The leaders set an ambitious target to double bilateral trade from around USD 100 bn (in FY 2024-25) to USD 200 bn by 2032, building on the existing Comprehensive Economic Partnership Agreement (CEPA) framework.

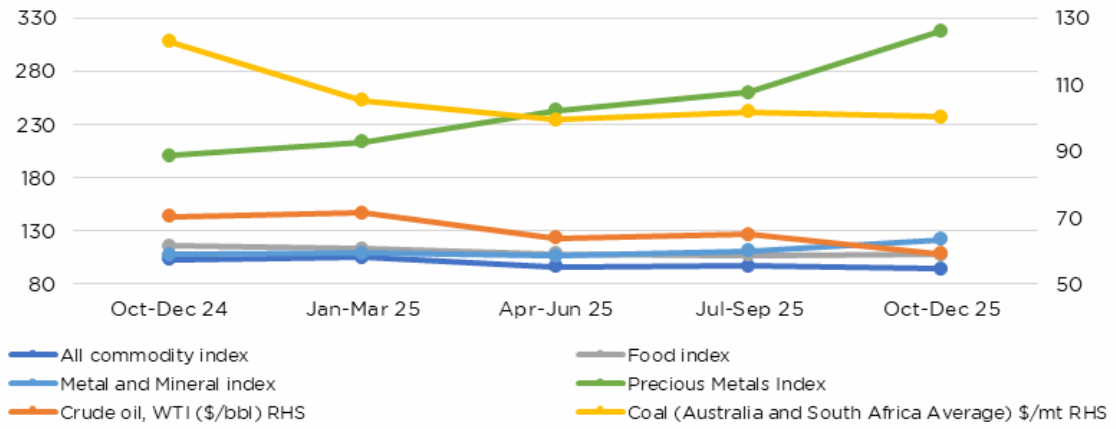
3. Commodity Price Trends[64]

On a quarterly basis, the all-commodity index remained broadly subdued, as persistent weakness in energy and agricultural prices outweighed gains in metals. Crude oil prices stayed soft amid oversupply and weaker demand, while coal prices, after a sharp decline earlier in 2025, largely stabilised.

On an annual basis, the period was characterised by a steady rise in precious metals, a clear downward trend in crude oil, relative stability in food prices with mild fluctuations, and a gradual improvement in industrial metals toward late 2025, together resulting in a broadly stable but subdued all-commodity index, capped by ongoing oversupply conditions in key segments.

61 https://ec.europa.eu/commission/presscorner/detail/en/ip_26_113
62 https://global.chinadaily.com.cn/a/202601/21/WS69704413a310d6866eb34f16.html?
63 https://www.pmindia.gov.in/en/news_updates/joint-statement-visit-of-president-of-the-uae-his-highness-sheikh-mohamed-bin-zayed-al-nahyan-to-india/?
64 https://www.worldbank.org/en/research/commodity-markets?

Fig 22: Price indices across key commodity indices



Source: World Bank

Crude oil prices weakened further during the third quarter, extending the downward trend observed through most of the year. Abundant global supply, easing geopolitical risk premiums, and concerns over slowing demand growth in advanced economies weighed on prices, despite occasional volatility. Food prices showed relative stability to mild firming toward the end of 2025, following an extended period of softening earlier in the year. While some commodities experienced short-term weather-related fluctuations, global food prices remained contained, supported by record or near-record production levels of major crops such as maize, rice, wheat, and soybeans.

Industrial metals prices remained resilient during the third quarter, supported by expectations of a cyclical recovery in manufacturing activity and continued demand linked to energy transition technologies. Prices of copper, aluminium, and nickel were underpinned by infrastructure spending, renewable energy deployment, and electric-vehicle supply chains, even as global industrial momentum remained uneven. While gains were more moderate than earlier in 2025, metals prices held firm through the quarter, reflecting tighter inventories and improving demand prospects.

Precious metals outperformed other commodity groups throughout the third quarter, driven by strong safe-haven demand amid geopolitical tensions, financial market volatility, and expectations of lower global interest rates. Gold prices continued to rise steadily, supported by sustained central-bank purchases and investor hedging against macroeconomic and policy uncertainty.[65] Silver also strengthened, benefiting from both safe-haven demand and growing industrial usage, particularly in renewable energy and electronics. Platinum prices remained supported by constrained supply conditions.

65 ttps://nypost.com/2025/12/22/business/gold-and-silver-soar-to-record-highs-as-fed-pivot-sends-yields-tumbling/

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Notes

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