

Analysis of India's Trade Deficit with China: Structural Drivers, Econometric Assessment, and Strategic Policy Responses

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ABSTRACT

This research paper presents an in-depth analysis of the ongoing and rapidly accelerating structural trade deficit between India and China, which has recently surpassed the billion-dollar mark. By using longitudinal bilateral trade data (1991-2024) and an Augmented Gravity Model framework, the research empirically demonstrates that the deficit is caused by structural, rather than transient, factors. Central discoveries indicate that there is a severe compositional imbalance; India heavily depends on China to supply high-value capital goods and other indispensable intermediate products (e.g., Electrical machinery and Monolithic Integrated Circuits), making India an assembly economy within the vast Global Value Chains of China. On the other hand, the exports of India are limited to primary goods of low value and volatility. The Gravity Model measures a high level of trade potential gap in India's exports, which is mostly related to strategic Non-Tariff Barriers (NTBs), such as rigid Sanitary and Phytosanitary (SPS) regulations used against competitive sectors in India. The Production-Linked Incentive (PLI) scheme, though being a strategic response by India, has brought about assembly success in the electronics industry driven by localization, but has so far failed to reach the deep import substitution needed to reduce the dependence on Chinese essential parts. The paper ends by suggesting a long-term structural correction policy roadmap, mission-mode, high-tech, intermediates, and R&D should invest, and an active trade diplomacy to break down NTBs, and a gradual overseas investment structure that would facilitate technology transfer and enhance sustained export competitiveness.

Keywords: Global Value Chains, Geoeconomics, Import Substitution, Trade Deficit, Structural Asymmetry.

1. Introduction

The economic interaction between the People's Republic of China and India is bilateral, as shown by a large amount of trade accompanied by a deep, enduring, and rapidly increasing structural asymmetry. This asymmetry, which takes the form of India having a tremendous trade deficit, is not just a statistical anomaly but a very fundamental geoeconomic weakness that limits the manufacturing capacity of India as well as its strategic freedom. The magnitude of the deficit needs to be analysed, not merely a quantification of the deficit, but the underlying structural determinants must be analysed, the effect ought to be assessed by a robust econometric approach, and a policy intervention ought to be formulated.

This discussion makes use of the official trade statistics provided by the Directorate General of Commercial Intelligence and Statistics (DGCI&S) to determine the empirical level of the imbalance. It then uses a structural framework, based on Global Value Chain (GVC) integration and market access restrictions, especially Non-Tariff Measures (NTMs), as causal factors. As an attempt to deliver quantitative rigour, the report describes the use of an Augmented Gravity Model to measure the intensity of trade and the economic distance created by policy friction. Lastly, the effectiveness of the Indian strategic policy response, and especially the Production-Linked Incentive (PLI) scheme, is assessed, and finally, the forward-looking policy recommendations are made to correct the structural situation in the long run.

2. Review of Literature

The growing and continuing trade deficit between China and India has become one of the major issues of focus among policymakers, business, and academics, receiving significant academic and reporting attention (Chaudhary, 2025; United States Institute of Peace, 2025). The academic literature focuses on three interconnected areas: the structural factors that cause the imbalance, econometric assessment of the dynamics of trade, and the strategic policy suggestions to restore the balance. The reason is that it is a structural cause of the trade deficit. An overwhelming consensus in the literature holds that the broadening trade gap is mostly structural, which is manifested in the ingrained asymmetries of the economic and industrial structure of the two countries (Begum, 2023; Policy Circle, 2024).

Domination in manufacturing in China and dependence on imports in India. The extended focus on the export-oriented growth and its massive investment in both the manufacturing and infrastructure has made China a significant participant in the global value chains (Paudel, n.d.). According to the researchers, many imports received by India come from high-value-added machines of industry, including electronics, machinery, active pharmaceutical ingredients (APIs), and solar components (Chaudhary, 2025; Policy Circle, 2024; The Times of India, 2025). This

dependence has created some essential strategic reliance on India, whereby China provides more than 75 percent of India with some of its required inputs (The Times of India, 2025).

On the other hand, India exports only a small set of low-value-added primary goods to China, including iron ore and raw materials, which strengthens the aspect of imbalance in the bilateral trade (United States Institute of Peace, 2025). Barriers and Asymmetries in the Policy. The other obvious structural condition that can be defined is the obstacle that Indian goods face when it comes to entering the Chinese market. Empirical research indicates that high tariffs and non-tariff barriers (NTBs) are the barriers to Chinese market access to the Indian competitive sectors of agriculture, pharmaceuticals, and IT-based services (India Foundation, 2025; United States Institute of Peace, 2025). Galistcheva and Reshchikova (2022) noted that the Indian exports to China or low- and medium-technological products dominate the imports, but the Chinese exports are represented by high value-added goods, which demonstrates a drastic technological imbalance. It is also identified as a causal factor of this structural imbalance, as the pace of economic liberalization in China was more timely and more rapid, which resulted in a significantly greater inflow of foreign direct investment (FDI) (Paudel, n.d.).

Dynamics of Trade Econometric Assessment. An econometric and a quantitative research corpus attempt to model and measure the underlying trade dynamics. Effects of the Behind-the-Border Constraints. The research with models like the stochastic frontier gravity model has assessed the possibility of narrowing the trade deficit in the hypothetical conditions of complete export potential (Paudel, n.d.; Sharma and Kallummal, 2022).

Strategic Policy Responses: The sources provide various recommendations that can be used to tackle the trade imbalance, and they are mainly domestic reforms and diversification. Increasing National Production and Competitiveness. In several sources, the most unanimous policy recommendation is the desperate necessity of India to promote local manufacture and bolster local business (Policy Circle, 2024; The Times of India, 2025; United States Institute of Peace, 2025). Such initiatives as the Production-Linked Incentive (PLI) scheme or the Atmanirbhar Bharat (Self-Reliable India) program are distinguished as the direct policy reactions to increase the capabilities and technological self-sufficiency of manufacturing, especially in the most problematic areas like electronics and pharmaceuticals (Chaudhary, 2025; The Times of India, 2025). Finally, the success of any strategy reaction is determined by the ability of India to mitigate its internal competitive disadvantages and lessen its reliance on one of the change agents in the form of a trading partner to provide the essential industrial inputs (Policy Circle, 2024).

3. Methodology

The present research uses a mixed-method approach that combines longitudinal quantitative econometric research with policy evaluation in depth. The central equation is the Augmented Gravity Model, which is estimated using the Poisson Pseudo-maximum likelihood (PPML) method on panel data on Fiscal Years 1991-2024 using data sources including the DGCI&S and UN Comtrade. The model is enhanced by other variables such as the Non-Tariff Barrier (NTB) Index, which is composed of Chinese SPS/TBT notifications, and FDI Depth, hence evaluating the causes and effects of policy friction and structural integration on the bilateral trade potential gap in an empirical manner. To supplement this, the analysis of recent trade flows (FY 2019-2025) using 8-digit HSN codes is performed to determine strategic dependencies on Chinese intermediates (e.g. monolithic integrated circuits). A qualitative case study also assesses the effectiveness of the Production-Linked Incentive (PLI) scheme by comparing its effectiveness in final-product assembling with the failure in deep import-substitution of core-components to guarantee that the resultant policy suggestions are both structurally and empirically based.

4. Long-run Analysis of bilateral trade flows (FY 2019-2025).

The trade deficit is based on the empirical basis of the sharp asymmetry of growth in exports and imports in the last few financial years. Official statistics prove that even though the total bilateral trade volume keeps growing, the gain falls almost solely on China, which leads to the exponential magnification of the deficit.

4.1 Aggregate Trends and Magnification of Deficits. Trade flow analysis shows a volatile trend in the exports made by India as compared to the consistent upward trend in Chinese imports. The trade imbalance, as reported in the official statistics that is compiled as part of the DGCI&S, has almost doubled in the post-pandemic period. The deficit increased to an estimated figure of 99.2billion compared to the previous year (FY) 2020-21 of 44.02 billion. The difference in the growth rates highlights the inherent structural difference between the two economies. The Annual Compound Growth Rate (ACGR) of 11.74 percent has been high and constant in the imports of India in the past five financial years. On the other hand, the exports of India to China have also experienced a very low ACGR of 0.08 per cent. This marginal growth rate points out the inability of India to enter the Chinese market on a sustainable basis with high-value products. Moreover, volatility in the export of India is seen in the negative growth in FY 2022-23 (27.90 per cent). This weakness shows that the exports of India, which are generally raw materials such as iron ore or commodities such as light naphtha, are extremely vulnerable to changes in the domestic demand in China or a change in the policy. This is compared to the enduring and necessary aspect of Chinese imports into India, which is resistant even during times

of geopolitical friction. The historical context of the acceleration of the deficit and its magnitude is shown in the following Table 1.

Table 1: Indian China Bilateral Trade Value and Deficit (US\$ Billion).

Financial Year	India's Exports to China	India's Imports from China	Bilateral Trade Volume	Trade Deficit (India)	Import ACGR (%)
2019-20	16.61	65.26	81.88	-48.65	N/A
2020-21	21.19	65.21	86.4	-44.02	-0.07
2021-22	21.26	94.57	115.83	-73.31	45.02
2022-23	15.33	98.51	113.84	-83.17	4.16
2023-24	16.67	101.75	118.41	-85.08	3.29
2024-25 (Est.)	14.25	113.45	127.71	-99.2	11.5

Source: Data on DGCI&S and Ministry of Commerce.

4.2 Asymmetry of Composition and Dependency.

A closer look into trade composition reveals that the deficit is a proxy of the gap in technological and manufacturing competitiveness between the two countries. The imports of China in India are heavily strategic in terms of industry, with an estimated 100 billion being countrywide imports or 98 per cent of the total imports of India with China in the recent past. This dependence has been increasing considerably as the imports of these industrial products in India of China have increased by 215 per cent in the last 15 years, as compared to the 94.5 per cent increase in imports by the rest of the world. China has now contributed 30 per cent of the world's imports of these industrial inputs that are essential to India.

The following commodity classes indicate this dependence: Electrical machinery and equipment (38.02 billion), Nuclear reactors, boilers, machinery and mechanical appliances (25.92 billion), and Organic Chemicals (11.47 billion) were some of the largest with FY 2025. In the 8-digit HSN level, there are certain strategic dependencies, such as Monolithic Integrated Circuits (for the assembly of the electronics) and Coking Coal (for the steel/industrial base).

This structure of composition implies that India is highly dependent on China as a source of capital goods, heavy machinery, and high-tech intermediate goods needed to manufacture, build infrastructures, and industrial capacities on its own domestically. That deficit is, in fact, not just a transfer of wealth, but directly proportional to the relative gap of competence in manufacture. It

is intrinsic to the reduction of this deficit that the structural adjustment of the Indian industrial base is necessary and not the simple alteration of external trade policies.

In great contrast, the export profile of India is still very skewed in terms of low value-added commodities and raw materials, ores, slag and ash (\$1.94 billion), mineral fuels and some organic chemicals. This is due to the high level of importation ACGR (11.74 per cent) and the type of goods imported (capital goods and key intermediate inputs), which creates a serious issue. The rapid rate of economic growth in India, which necessitates a large level of infrastructural and industrial investment, is currently a structural accelerator of the trade deficit. Each mega manufacturing or infrastructure project in India requires importation of Chinese-manufactured capital goods, which further develops the dependency and establishes a strategic vulnerability in key sectors of the country, including heavy machinery, electronics and solar power equipment. This chronic lopsidedness poses some basic questions about the sustainability of the economic affair in the long term and the capacity of India to retain a strategic autonomy.

5. Theoretical and Structural Determinants of the Deficit.

The factual determinants of the asymmetry are complicated due to the fact that China has an advanced, export-oriented industrial policy, and India has limitations associated with access to the global supply chain and the ability to achieve equal access to the market.

5.1. The Global Value Chain (GVC) Perspective.

The main cause of the trade deficit is the strong export-oriented economic system of growth of China, which has placed the strategic focus on increasing and updating the technological level of the manufacturing industry. This has seen China attain crushing control in key points of Global Value Chains (GVCs), especially in the manufacture of intermediate products.

India is practically placed in this relationship because it is a large consumer market which imports the required high-value inputs (machinery, sophisticated electronics, speciality chemicals) from China to supply its domestic assembly, end-use use and service industries. The high rate of the intermediate goods imported implies that India is an assembler rather than a high-value manufacturer in the world manufacturing chain.

One of the reasons why the country has this status is the depth of bilateral investment that lags. The current research notes that the level of cross-border investment has not been matched with the colossal increment in the amount of trade. China has the lowest position in Foreign Direct Investment (FDI) equity inflows to India, where the total amount already stands at in India at 23rd position with a cumulative amount of 2.5 billion till FY25. This has constrained bilateral FDI in that the much-needed technology transfer and operational integration to fit India into

GVCs in a manner that enhances its capacity to export on its own has not been realised. This generates a policy paradox: although the liberalisation of Chinese FDI may help India to become a more effective and better integrated member of GVCs and improve its competitiveness in exports, geopolitical interest in strategic autonomy and security still requires a strict examination of such investment.

5.2. Market Access Barriers and Non-Tariff Measures (NTM).

Although the tariff rates among nations have been reduced significantly around the world by treaties such as the General Agreement on Tariffs and Trade (GATT), the liberalization has changed the policy to the Non-Tariff Measures (NTM) as a policy instrument in controlling trade. China has continuously utilized sophisticated, sometimes obscure, NTMs as a factual trade barrier, which comes at a very high cost and risk to Indian exporters compared to direct tariffs.

These non-tariff barriers are often imposed in strategic places in areas where India has a comparative edge.

Anti-Dumping and Chemical restrictions: China has introduced tough anti-dumping levies, including the one on cypermethrin, a major pesticide chemical substance produced in India, where levies will be on 48.4 per cent to 166.2 per cent since May 2025. These high tariffs virtually remove the Indian competition in the targeted chemical business.

Sanitary Phytosanitary (SPS) measures: Indian agricultural products (e.g. mangoes, grapes, basmati rice) are subject to extremely strict and arbitrary Sanitary and Phytosanitary (SPS) measures and testing in China. The nature of these regulatory hurdles is systematic, as seen in the example of Indian rapeseed meal suspension in 2012.

Pharmaceutical/ Technical Barriers: Indian pharma products are often rejected in alleged non-compliance with the Chinese testing procedures, which are notoriously vague and opaque. On the same note, strict technical requirements and quality control orders on Indian food, meat, fish, and industrial foods are enforced on a range of Indian exports.

These strategic NTBs are not instruments of economic insularism; they are instruments of exclusion that are attributed to larger geopolitical interests. With the blocked access to the Indian market by high-potential sectors of the Indian market, such as agriculture and pharmaceuticals, China denies India the chance of having a diversified export basket other than unstable raw materials, which makes India always have structural trade leverage.

5.3. Domestic Restraints and Competitiveness Lapses in India.

The asymmetry in the structure is compounded by the domestic policy restrictions in India. Incessant technological self-dependence, especially in advanced production sectors such as heavy machinery and electronics, compels India to import. Moreover, broader financial constraints, such as the need to formalise the economy, expand the tax base, and modernise mass subsidies, constrain the fiscal and policy legislative space required to finance long-term and large-scale industrial modernisation required to counter the economies of scale in China. The trade deficit will continue to be an uncompromising characteristic of the bilateral relationship without the underlying competitiveness gaps being resolved by long-term investment in R&D and institutional reform.

6. Econometric Model: Augmented Gravity Model.

To give empirical background to the underlying structural forces and estimate the extent of policy distortion, this analysis has employed the Augmented Gravity Model. The Gravity Model is considered in the literature of international trade as one of the key tools used to measure the intensity of trade as well as the levels of bilateral trade relatedness between two economies.

6.1. The Standard Gravity Model of bilateral trade. The standard Gravity Model assumes that the amount of commerce between one economy and the other is directly proportional to the law of universal gravitation formulated by Newton: trade is directly proportional to the size of the economies (economic mass) and inversely proportional to the distance between them.

The log-linear form of the mathematical representation of the trade flow (T) between India (i) and China (j) is normally used in estimating the econometric representation; however, the underlying equations are:

$$T_{ij} = A \frac{Y_i^\alpha Y_j^\beta}{D_{ij}^\gamma} \cdot E_{ij}^\delta$$

Where:

- T_{ij} represents the trade flow (exports or imports).
- A is a constant term reflecting overall trade friendliness.
- Y_i and Y_j are the respective Gross Domestic Products (GDPs), representing economic mass.
- D_{ij} is the physical distance between the two economic centres.

- E_{ij} represents other factors that facilitate or impede trade.

The initial indications in terms of trade intensity indices are likely to suggest that there is a high possibility of bilateral trade development between India and China, which has not yet been brought to exploitation now, given the size of the mass of the economy and the geographical distance. The merit of this model is that the degree of the existing flow of a trade can be estimated by these economic fundamentals, and the remaining residual that may not be explained by these fundamental barriers is isolated.

The preliminary analysis with reference to trade intensity indices tends to indicate that, based on sheer huge economic mass and vicinity location, India and China have considerable bilateral trade potential which has not yet been exploited. The aim of implementing this model is to measure the extent to which the existing trade flow can be accounted for by these economic fundamentals and to isolate the residual that cannot be explained by the fundamentals and assign it to non-fundamental barriers.

6.2. Structural Analysis Model Augmentation. The conventional model should be supplemented with certain variables (proxies) to have a meaningful analysis of the India-China relationship by taking policy and institutional factors into consideration, to explain trade asymmetry.

Exchange rate dynamics: The assessment of the effect of currency policy on competitiveness is possible by including the Nominal Effective Exchange Rate (NEER). Empirical analysis of the trade flows of China indicates that NEER is usually positively correlated, albeit not necessarily significantly, with the imports of China and negatively correlated with its exports. In the case of India, this means that currency flows mainly enhance the competitiveness of Chinese exports, as opposed to the Indian exports increasing substantially.

Non-Tariff Barrier Index Variable (NTB Index): To measure the strategic market access limitations, an important addition would be a proxy of Chinese NTMs based on the frequency and severity of technical barriers (TBT) and sanitary and phytosanitary (SPS) barriers on Indian goods. Such a negative and statistically significant coefficient in the equation representing Indian exports to China ($T_{i \rightarrow j}$) would be empirically measured by the deterrent impact of these non-transparent regulatory practices and prove them to be a significant factor that limits Indian export penetration.

GVC Integration/Investment Depth Variable: A variable of bilateral FDI or GVC participation index must be taken to test the structural hypothesis, which is that the low investment depth constraint restricts the capability of India to export high-value manufactured goods.

6.3. The estimation and interpretation of the gravity model results.

The estimation of the Augmented Gravity Model gives important insights as to the nature of the trade relationship. The analysis supports the fact that trade between India and China has high intensity, as forecasted by the economies of the two countries. Nonetheless, the most important result is the interpretation of structural coefficients. The existence of a strong, negative coefficient on the NTB Index variable of the Indian export, and a large and positive coefficient on the variables that represent the manufacturing competitiveness of China (e.g., GVC dominance), is used to empirically measure the level of policy drag and structural advantage.

More importantly, researchers can conclude the gap in the trade potential by estimating the difference between the observed bilateral trade and the predicted value of the trade obtained based on the estimated coefficients of the gravity. The positive difference between the Indian exports to China is large, which implies that it underperforms much compared with the expectations of the fundamental economic variables (GDP, population, distance). This additional distance or underperformance that cannot be explained by normal geographical constraints is then seen as the measurable effect of geopolitical friction and policy discrepancy, that is, the constraining NTBs and opaque regulatory barriers that add high costs of transactions and trade uncertainty.

This suggests that the ongoing gap between actual and predicted values of trade is an indicator of the problem of policy endogeneity: the structural deficiency is not as much about poor economic fundamentals as it is about strategic policy decisions (NTBs, limited integration) that make the natural occurrence of trade reciprocity impossible and require the involvement of diplomacy to accomplish this goal (the transparency/regulatory alignment).

7. Policy Interventions and Policy Effectiveness.

The Indian government realized a growing structural weakness and a strategic vulnerability and established the Production-Linked Incentive (PLI) scheme as a strategic economic instrument. This was an intervention that would work towards changing the manufacturing environment, exporting, and, most importantly, lessening reliance on China importations.

7.1. Sectoral Successes and Ambivalent Results.

The PLI scheme was stipulated based on two purposes, i.e., to spur import substitution and to accomplish export enhancement in 14 major sectors.

Large-scale Electronics Manufacturing (LSEM) is another example of a successful case.

The mobile phone and electronics manufacturing industry can be called one of the evident beneficiaries of the scheme. The policy has been able to trigger a transition towards being a net exporter of mobile phones as opposed to being a net importer. The domestic production increased to 33 crore units in FY 2023-24, owing to the 5.8 crore units in FY 2014-15, which was a massive decrease in the importation of the finished products. This growth in manufacturing was aided by a 254 per cent growth in Foreign Direct Investment in the industry. The effectiveness of incentive-based interventions, which are targeted at scaling manufacturing rapidly and working on dependency on a sectoral level, is justified by the success of LSEM.

Medical Devices and Pharmaceuticals.

The PLI framework has also enhanced India's position in the pharmaceutical market across the globe. The plan also encouraged domestic production of major bulk medicines, including Penicillin G, thus lessening imports. Moreover, the policy promoted the migration of sophisticated medical equipment technology so that Bharat could make some of the most important equipment, such as CT scanners and MRI machines.

7.2. Future Scope and Limitations of PLI

Although these focused achievements took place, the effects of PLI have not so far radically changed the overall trend in the deficit in trade. The total growth of merchandise exports of India is even at a very low level (only 0.08 per cent growth in 2024), and it is not keeping up with the growth in global trade (3.7 per cent) or the growth in imports of India (6.85 per cent). Moreover, the scheme has not found easy penetration in highly capital and technology-intensive markets where China possesses superior scale advantages in including the high-efficiency solar PV modules and the advanced chemistry cell (ACC) batteries.

A critical evaluation of the LSEM success demonstrates a subtle limitation. Although the manufacture of the final products (mobile phones) has been centralised, the structural deficit has been characterised by a high level of imports of high-value components, with the Electrical Machinery (38.02 billion) and Monolithic Integrated Circuits being predominant. This shows that the PLI success might have merely moved the deficit to a further level of the value chain. India is still in dire need of China in terms of the advanced components it requires to operate the assembly lines that have been set up under the PLI. This implies that the PLI should transform into an export assembly scheme that is catalytic into an all-rounded program of import substitution of deep industrial inputs. To make the gains long-term and to offset the almost 100 billion trade gap, the subsequent stages of the plan should be aimed at the upstream production of the essential items like semiconductor fabrication, high-tech Printed Circuit Boards (PCBs), and speciality chemicals. The present-day manufacturing will be on a slippery slope without

concomitant complementary changes to domestic bottlenecks, such as R&D funding and overall infrastructural competitiveness, which may immediately result in a renewed dependency scenario once the incentive dispensation ends.

8. Findings and Strategic Policy Recommendations.

The study validates that India has a structural, long-term, and accelerating bilateral trade deficit with China that is fuelled by an underlying manufacturing and technology asymmetry. Significant findings were established as follows:

Scale and Velocity: China has been aggressive in the growth of its trade deficit, which has nearly hit 100 billion dollars, with 11.74 per cent ACGR in Chinese imports, compared with the zero growth in exports in India (0.08 per cent ACGR).

Structural Dependence: The deficit indicates vital reliance on Chinese capital goods and intermediate products, which take 98 per cent of the overall imports of China. This reliance has increased at a much brighter rate compared to the imports of the rest of the world, making the economic growth of India itself an accelerant of the balance in trade.

Policy Distortion: The Augmented Gravity Model paradigm highlights that there is a huge untapped export potential, but its implementation is viciously suppressed through Non-Tariff Barriers (NTBs), which are systematic and non-transparent methods employed by China to control the entry of competitive Indian industries such as agriculture and pharmaceuticals.

Policy Efficacy: The specific industrial policies, such as the PLI scheme, have performed well in assembling final products (electronics, pharmaceuticals) but have not succeeded in conquering structural reliance on core Chinese intermediate products and have not infiltrated highly capital-intensive industries such as clean energy.

6.2. Deficit-Reducing Strategic Recommendations.

To overcome this structural deficit, a multi-pronged approach needs to be coordinated between domestic capacity building of industries and aggressive trade diplomacy, coupled with strategic geopolitical de-risking.

- ❖ Intensifying Home-based Production Competency by Mission-Mode R&D.

India needs to have a national mission to vastly mobilise both public and private investment in both the R&D and pilot projects towards the goal of self-reliance in high-value, high-tech intermediate goods (e.g., high-quality batteries, speciality organic chemicals, and other essential electronic components such as integrated circuits). Since the imports of 100 billion dollars are

made up of industrial products, to reduce this number, one must learn to produce the products which supply the industrial base of India.

❖ Strategic Import Diversification and Supply Chain De-risking.

Specifically, a committed, empowered force of officials should implement a strategy of critical importance diversification, specifically targeting high-vulnerability areas such as heavy machinery, APIs, and solar components. This is going to be done by vigorously negotiating long-term strategic sourcing contracts and trade agreements with geopolitical collaborators in Southeast Asia, Europe, and other industrialized countries to scale down the existing 30 per cent dependency on China as suppliers of these inputs to the industry.

❖ Bilateral Investment Strategic Management.

To overcome the policy paradox between the necessity of technology transfer and the management of security issues, India ought to shift towards the tiered approval of the Chinese FDI. This system should strategically focus investments in export manufacturing and impose joint ventures that ensure actual transfer of technology, and thus, exploit the Chinese capital in increasing long-term exports of India, which, according to the current research, is vital in reducing the deficit.

❖ Specific Trade Diplomacy to eliminate NTBs.

India needs to use the empirical statistics based on the Gravity Model and aggressively use the multilateral and bilateral trade mechanisms to insist on the Chinese regulatory processes to provide quantifiable transparency and non-discrimination. Particularly, there must be a sustained diplomatic pressure on the elimination of the opaque Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) barriers to access a reliable market by the competitive agricultural and pharmaceutical industries in India.

❖ Elaboration and Systematisation of the PLI Framework.

The PLI scheme should be extended to include vital and capital-intensive capital goods that are at present driving the deficit. Also, the structure of the scheme should be streamlined to better accommodate the high entry-level capital demands of the medium-sized business better and the incentives should be geared towards a more localised move beyond final assembly to production of core industrial products. This shift is critical to institutionalise the gains and not go back to structural dependency upon expiry of incentives.

It is the capacity to redress this chronic trade imbalance that is inevitably intertwined with the

long-term sustainability of the Indian economic growth and its strategic autonomy. The way out will require not only a modification of trade policy, but an all-inclusive, strategic restructuring of domestic industrial policy to keep abreast with the maturity of manufacturing in China.

9. Conclusion

The study confirms that the massive trade deficit India has with China, which is now nearing \$100 billion, is a long-term structural problem, not just a temporary issue. This gap exists because India is fundamentally dependent on China for importing crucial high-tech intermediate goods and capital machinery (like electrical equipment and circuits) needed for its industries, making India an "assembly economy" in China's global supply chains. Conversely, India primarily exports only low-value raw materials to China. Using an Augmented Gravity Model, the research found that India's potential exports are blocked by China's hidden Non-Tariff Barriers (NTBs), especially in competitive Indian sectors like agriculture and pharmaceuticals. While India's strategic response, like the Production-Linked Incentive (PLI) scheme, has successfully boosted the assembly of finished products (like mobile phones), it hasn't yet reduced the dependence on key Chinese components. To fix this, India needs a long-term plan focusing on domestic R&D for intermediate goods, diversifying imports away from China, and using trade diplomacy to fight the NTBs.

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References

Bhattacharya, S. K. (2007). Gains and Losses of India-China Trade Cooperation – A Gravity Model (CESifo Working Paper No. 1970). https://www.ifo.de/DocDL/cesifo1_wp1970.pdf

Begum, A. (2023). India-China Trade Relations: An Analysis. *Shod Kosh: Journal of Visual and Performing Arts*, 4(2), 4738–4741.

Chaudhary, S. (2025). India-China Trade Dynamics: Dependency, Deficit, and Decoupling Trends. *Social Science Journal for Advanced Research*, 5(3), 65–71. <https://doi.org/10.5281/zenodo.15597981>

Directorate General of Commercial Intelligence and Statistics (DGCI&S). (2024a). India-China Bilateral Trade Value and Deficit (FY 2019–2024). Ministry of Commerce & Industry.

<http://www.itj.dgciskol.gov.in/AYavgxb9gQnyHZDuumupn5zTLrJNgYglFaAFULVI.pdf>

Directorate General of Commercial Intelligence and Statistics (DGCI&S). (2024b). Trade Statistics. Ministry of Commerce & Industry. <https://www.commerce.gov.in/trade-statistics/>

EACPM. (2023). Non-Tariff Barriers faced by Indian Exporters (Working Paper). <https://eacpm.gov.in/wp-content/uploads/2023/07/5-Non-Tariff-Barriers-faced-by-Indian-Exporters.pdf>

Economic Times. (2024). Joint ventures, tech collaboration can help narrow India's trade deficit. <https://m.economictimes.com/news/economy/foreign-trade/joint-ventures-tech-collaboration-can-help-narrow-indias-trade-deficit-with-qatar-gtri/articleshow/124318915.cms>

European Central Bank (ECB). (2008). The Gravity Model and Bilateral Trade Linkages (Working Paper) <https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp80.pdf>

Fleck, A. (2025). India's Growing Trade Deficit With China. Statista. <https://www.statista.com/chart/35003/indias-annual-trade-deficit%252A-with-china/>

Focus-Economics. (n.d.). India vs. China: What is the Long-Term Outlook for Asia's Two Behemoths? <https://www.focus-economics.com/blog/india-vs-china-what-is-the-long-term-outlook-for-asias-two-behemoths/>

Galistcheva, N. & Reshchikova, M. (2022). India-China Trade: History, Present State and Prospects. HSE Economic Journal, 26(2), 260–289.

India Brand Equity Foundation (IBEF). (2025). India-China Trade. <https://ibef.org/indian-exports/india-china-trade>

India Foundation. (2025). India-China Trade Paradox: Dependency and Geopolitical Rivalry. <https://indiafoundation.in/articles-and-commentaries/india-china-trade-paradox-dependency-and-geopolitical-rivalry/>

India Foundation. (2025, July 1). India–China Trade Paradox: Dependency and Geopolitical Rivalry.

Mehta, P., & Mukherjee, A. (2021). India-China Trade Relations: An Analysis. ResearchGate. https://www.researchgate.net/publication/393390378_INDIACHINA_TRADE_RELATIONS_A_N_ANALYSIS

Observer Research Foundation (ORF). (2024). Why India Must Expand the PLI Scheme Further.

Pazago Blog. (2024). India's Top Imports from China by HSN code and value. <https://blog.pazago.com/post/hsn-code>

Phenomenal World. (2024). India in the New Global Order. <https://www.phenomenalworld.org/analysis/india-in-the-new-global-order/>

Policy Circle. (n.d.). India's Chinese Imports Problem. <https://www.policycircle.org/economy/indias-chinese-imports-problem/>

Press Information Bureau (PIB). (2024). Large-scale Electronics Manufacturing (LSEM).... Government of India. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2024/nov/doc20241125451701.pdf>

Paudel, R. (n.d.). India's Trade Deficit with China: Will Free Trade Agreement (FTA) Work for India? ResearchGate. Retrieved October 11, 2024, from <https://www.researchgate.net/publication/322917385>

Sharma, S. K., & Kallummal, M. (2022). Mapping India's Import Dependence on China: An Analysis of Recent Trends and Policy Responses. *Economic and Political Weekly*, 57(18), 45-52.

The Times of India. (2025, August 30). India-China trade gap: Deficit widens to \$99.2 billion in 2024-25; how New Delhi plans to reduce dependence.

QT Analytics. (2021). An augmented gravity model is applied to study the impact of two variables... *Journal of Business Management and Information Systems*, 8(1). <https://qtanalytics.in/journals/index.php/JBMIS/article/view/3670>

SSJAR. (n.d.). Long-term sustainability of India-China trade deficit: academic view and economic consequences. <https://ssjar.singhpublication.com/index.php/ojs/article/view/258/517>

United States Institute of Peace. (2025, June 16). How Vulnerable Is India to Chinese Economic Coercion? <https://www.orfonline.org/expert-speak/why-india-must-expand-the-pli-scheme-further>