Domestic Linkages, Trade Structure, and Standards

Evidence from Input–Output Analysis and India–EU Trade under the Proposed Free Trade Agreement

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Abstract

The paper studies Indian trade outcomes through its evaluation of proposed Free Trade Agreement with the European Union. The research uses input-output analysis to track Indian domestic backward and forward linkages development from 2010 until 2022 and connects this data to India-EU trade patterns which existed from 2017 until 2024. The evaluation of sectoral trade balances together with energy-non-energy decomposition demonstrates that India's recent trade position improvements result primarily from energy-related trade activities instead of industrial growth. The study found that sectors with strong domestic backward linkages-maintained export surpluses while forward-linked sectors depended on European Union imports. The research demonstrates how standards and regulatory restrictions impact trade benefits while showing that trade liberalization needs to match domestic production capacity.

Keywords

India–EU Free Trade Agreement; Input–Output Analysis; Backward and Forward Linkages; Trade Structure; Energy Decomposition; Standards and Regulation; Industrial Development

INTRODUCTION

Economic development of a nation is not just about growth in aggregate output; it is fundamentally about the interconnectedness of the sectors of a complex economy. Change does not happen in isolation; it has ripples throughout the economic network. Various inputs are needed for production in a sector to produce outputs, and those outputs may, in turn, serve as intermediate inputs for other sectors or feed into final consumer demand. Therefore, the internal structure of an economy matters a great deal for development and the types of policies needed to that end. According to Hirschman (1958), *The Strategy of Economic Development,* economic development as a process can be understood through intersectoral linkages, in which expansion in particular activities induces demand and investment in related sectors. In this view, development is not just the outcome of increased demand or capital accumulation, but about the way in which economic activities are structurally connected.

Generally, aggregate frameworks are concerned with demand and supply, wages and prices, or gross national product, but there are intermediate transactions between, say, a change in wages and their impact on prices. These steps are generally omitted in the abstract aggregate frameworks when dealing with two variables. To fill this gap is to trace how shocks originating in one part of the economic network propagate through the network before translating into aggregate outcomes.

The idea of the Input-Output Analysis method, developed by Professor Wassily Leontief in the late 1930s, is to document the inputs to a sector in columns and the intermediate outputs from a sector going to other sectors as inputs in rows, creating a matrix. So, if one moves vertically down a column, one can see all the inputs for a particular sector from different sectors, and if one looks straight across a row, one can see the outputs of a particular sector going into other sectors and into final demand. This matrix is what is also called an input-output table.

Input-Output Analysis is a way to systematically quantify the complex transactions and the mutual relationships among the various subsystems of an economic system. The structure of each sector's production process is represented by an appropriately defined vector of structural coefficients that quantify the relationship between the inputs it absorbs and the output it produces. The interdependence among the sectors of the given economy is described by a set of linear equations that express the balances between the total input and the aggregate output of each commodity and service produced and used over one or several periods of time (Leontief, 1986).

The level of interdependence or linkage is measured through backward and forward linkages in an economy. Backward linkage measures interdependence through purchases from other sectors, while forward linkages measure interdependence through sales to other sectors. The idea is that every economic activity will induce attempts to supply the output needed for that activity through domestic production, and every activity that does not, by its nature, cater exclusively to final demand will induce attempts to utilize its output as inputs in new activities. (Hirschman, 1958). This is why domestic linkages matter a lot for economic development; a lack of interdependence and linkage is one of the most common characteristics of underdeveloped economies.

Domestic backward and forward linkages represent interdependence and the sustenance of an economy. A domestic economy with strong linkages reduces the dependency on imports of

intermediate inputs for production. These linkages evolve with time. Therefore, there is a need for longitudinal comparison to understand changes over time and the evolution of linkages.

The recent EU-India Free Trade Agreement affects multiple sectors of the Indian economy directly and indirectly. Thus, to understand the real potential impact of the deal on the Indian economy, we must first understand the dynamics of the Indian economy, the evolution of linkages over time, and how the sectors directly affected are linked to other sectors. This investigation will tell us whether to meet the potential demands of the EU market, the Indian domestic economy has the capabilities, or whether the new demands will be met with imports for production.

This study analyses the evolution of backward and forward linkages of the Indian economy from 2010 to 2022 and uses annual trade statistics of India and the EU to understand the current trade situation. It is an attempt to understand the impact of the FTA and to investigate how India will benefit from trade with the European Union.

LITERATURE REVIEW

Structural Development and Intersectoral Linkages

Development economics regards economic development as not merely an increase in aggregate output, but also a transformational process in which the relations among sectors change over time. From this viewpoint, the degree of interdependence of different productive activities is crucial for boosting a growth impulse that turns into broad and sustainable developmental outcomes. Early structuralist thinkers used the network of relationships among sectors to explain how a rise in demand or investment spreads through the economy.

This line of thought was provided with a foundational contribution by **Albert O. Hirschman** in *The Strategy of Economic Development* (1958). Hirschman used the concepts of **backward and forward linkages** to capture the induction mechanisms through which expansion in one sector stimulates responses in related sectors. Backward linkages are when a growing sector induces an increase in demand for input supplied by other sectors, while forward linkages are when a sector's output becomes an input for downstream activities. Hirschman argued that activities having strong linkage effects possess a greater capacity to generate cumulative development by triggering complementary investments and production responses across the economy.

Consider this: many industries produce intermediate goods for other industries while also serving final demand. Thus, it is quite possible for industry A to be established because of the final demand for its products, crossing the threshold, and then for B to follow suit, not only because of the demand factors but also because B intends to use A's products as principal input. While the existence of industry A helps induce the establishment of industry B, the establishment of B in turn induces the development of new capacity for A.

Hirschman's framework really changed the conversation. Instead of pushing for balanced growth across the board, it argued for strategically developing sectors with the strongest ripple effects, the ones that really spur activity elsewhere. This perspective suggests underdevelopment isn't simply a matter of low output or scarce capital. More fundamentally, it's a condition in which the links

between sectors are weak, preventing growth from spreading internally. So, by focusing on these linkages, Hirschman gave us a structural reason why similar overall growth rates could yield such different development outcomes across countries.

Industrialization, Structural Change, and Linkage Dynamics

The linkage-centric understanding of development was later improved and clarified through the structural change literature, with the principal example being *Industrialization and Growth* by **Hollis Chenery et al.** Chenery carries on Hirschman's ideas by interweaving linkage analysis with a comparative and dynamic economic development framework. Rather than treating industrialization as a homogeneous expansion of the manufacturing sector, it highlights changes in the composition, complexity, and interdependence of production as economies develop.

One of the central tenets of Industrialization and Growth is that a successful development trajectory is reflected in an increased share of intermediate goods production and greater reliance on domestic supply chains. Chenery used input-output tables and material balance equations to show that intermediate demand relative to final demand increases during the industrialization of an economy, a sign of deeper production networks and more consistent production structures. This reduces reliance on imported inputs and makes the domestic economy more receptive to growth impulses.

Along with this, Chenery proposes a sector classification based on how activities relate to the production system, differentiating between primary and manufacturing, and between intermediate and final goods production. This typology makes it clear that industrial activities do not contribute equally to structural deepening. Intermediate manufacturing industries, such as the production of basic metals, chemical products, and machinery, show both backward and forward linkages more strongly than consumer goods industries. Therefore, the composition of industrial growth by sector becomes an imperative factor in determining development outcomes.

More importantly, Chenery stresses that linkage patterns are dependent on the path and over time. Initially, development stages typically involve disjoint production systems with a high degree of import dependence on intermediates. With industrialization, domestic linkages may strengthen, but this outcome is not a fait accompli. Whether economies undergo deep restructuring or remain dependent on imported inputs is influenced by government interventions, the foreign trade environment, and the nature of industrial expansion. Such a dynamic approach strongly justifies examining how linkages change over time rather than merely relying on static pictures.

Input–Output Analysis and the Measurement of Linkages

Hirschman and Chenery laid the groundwork by explaining the conceptual significance of intersectoral linkages, but their measurement and quantification require precise input, output analysis as a matter-of-fact analytical method. Input-output analysis, pioneered by Wassily Leontief, is a mathematically consistent model that describes the exchange of goods and services between sectors of an economy. Input-output tables, displayed as matrices, show intermediate transactions, enabling tracking of production changes driven by changes in final demand across interlinked industries.

The development of the model enables various analytical tools, such as the so-called Leontief inverse, which indicates the levels of direct and indirect production required to increase final demand by one unit. The Leontief inverse enables the measurement of backward and forward linkages by providing a picture of the extent to which the expansion of one sector activates its suppliers upstream and its customers downstream. Expanding on this method, some papers have mathematically corresponded column and row sums of the inverse matrix to linkage notions and thus have made Hirschman's qualitative insights into quantitatively describable indicators.

Further readings on input-output methodology, such as **Ronald E. Miller and Peter D. Blair's** co-authored publications, help better understand that the framework is also very helpful for analyzing major structural and sectoral changes and evaluating policy impacts. In fact, the authors show that input-output analysis is well-suited to investigating production structures and the consequences of trade and industrial policies in complex economies.

Trade, Import Dependence, and Standards

The correlation between local production systems and international trade results has been extensively debated over the last couple of years. For example, though trade liberalization is commonly linked to export growth, the literature highlights that export growth can be very import-intensive, especially in economies with weak domestic supply chains. Those are scenarios in which export growth makes little contribution to the local economy and, conversely, negatively affects the balance of payments by increasing intermediate imports.

Apart from the production perspective, an important part of the discussion concerns the role of domestic backward linkages in limiting or facilitating the leakage of trade-induced demand abroad. Countries with a well-connected domestic production network are more likely to use export growth to boost domestic activity; however, countries with disconnected production structures will always be import-dependent. This understanding is very much in line with both Hirschman's inducement mechanism and Chenery's focus on the production of intermediate goods.

Furthermore, aside from the production structure, recent books and articles give considerable attention to the role of regulatory standards and requirements in shaping trade outcomes. In fact, whereas the term 'access to the market' is generally defined by tariff levels, meeting the technical, environmental, and quality standards of advanced countries is equally, if not more, important for gaining access to their markets. These standards may be considered powerful non-tariff barriers for developing economies. The World Bank's World Development Report 2025 points out that standards not only influence the extent of gains from trade but also the quality of domestic compliance capacity. Furthermore, the report argues that the ability to meet the standards goes hand in hand with the right domestic institutions, technological know-how, and production structures, thereby emphasizing the importance of structural analysis in trade policy considerations.

Positioning of the Study

The study, relying on the works of Hirschman and Chenery, mainly examines the growth of internal forward and backward linkages in India and links this to the changing India-European Union trade relations. The objective is to combine the analysis of structural linkages with trade

and standards to determine how deeper trade integration could yield sustainable developmental gains.

DATA AND METHODOLOGY

Data Sources

The exercise required two types of data: first, the Indian economy's Domestic Leontief Inverse, and second, India-EU trade data. The domestic Leontief inverse is sourced from the OECD's Input-Output tables, and the trade data is sourced from the Government of India's Director General of Foreign Trade website's annual trade data, grouped by region. The timeline analyzed for linkage dynamics spans 2010 to 2022. Starting in 2010 enables the analysis to cover two distinct regimes over a decade and beyond the Covid-19 pandemic, facilitating a detailed interpretation of changes in linkages. 2022 is the last year for which input-output data are available, so this is the limit of this study. The trade data, on the other hand, is available in detail from 2017-18 to 2024-25, so it is taken for these years.

Construction of the Domestic Input-Output Framework

The input-output tables mainly describe the transactions between industries through which the production sectors of the economy exchange goods and services. The technical input coefficients matrix is one of the results of the input-output tables, in which each entry shows the amount of input from one sector required to produce one unit of output in another sector. The usage of inputs and outputs is fixed in the analysis, which agrees with the standard input-output framework.

By the nature of the research, which is to study the interdependence of domestic production, imports are considered competitive and thus excluded from the matrix of domestic transactions. This method allows separating the effects of domestic production from those of imported intermediate inputs. Using the domestic technical coefficient matrix, the domestic Leontief inverse is calculated. The domestic Leontief inverse reflects the total (direct and indirect) domestic production requirements associated with a change in final demand for a sector's product and thus serves as the starting point for analyzing intersectoral linkages in the Indian economy.

Measurement of Backward and Forward Linkages

For each year of the analysis, backward and forward linkages are calculated by using the domestic Leontief inverse matrix. Domestic backward linkages (BL^d) are obtained by summing up the columns of the domestic Leontief inverse. These figures show the extent to which an increase in demand for a given sector results in increased upstream demand for inputs from other sectors in the domestic economy. A higher backward linkage figure indicates that the sector is more dependent on domestic intermediate inputs and that upstream interdependence is stronger.

On the other hand, Domestic forward linkages (FL^d) refer to the sum of the rows of the domestic Leontief inverse calculation. Forward linkages reflect the extent to which a sector provides

domestic input to other sectors and hence demonstrate its significance as an upstream supplier within the production network. Industries with strong forward linkages are vital for facilitating downstream production activities.

Backward and forward linkage indicators are calculated individually for each year from 2010 to 2022. An examination of linkage computations over the years enables the identification of the changing structures and the development of the intersectoral interdependence. The study focuses solely on domestic linkages to evaluate the Indian economy's ability to internally absorb production impulses and thus reduce its dependence on imported intermediates.

Trade Data and Balance of Payments Decomposition

India-EU trade figures are derived from HS-classified merchandise trade statistics, as reported by the DGFT. Annual export and import values are summed up to get total trade flows between India and the European Union, and the trade balance is calculated as the difference between exports and imports. The trade balance is an indicator of the goods external position and is also used as a proxy for balance-of-payments pressures that arise from merchandise trade.

Assessing the structural sustainability of trade outcomes has led the study to separate energy from non-energy trade. The trade in mineral fuels and petroleum products is segregated from other types of merchandise trade due to price volatility and the cyclical nature of energy markets. This separation allows us to determine whether trade surpluses result from structurally embedded production sectors or from energy-related factors that might not reflect a country's long-run domestic production potential.

Trade data is aligned with broad production sectors to make them comparable with the linkage analysis. This combination enables an evaluation of whether sectors important to India-EU trade exhibit substantial domestic backward and forward linkages, and whether trade growth would be supported by domestic production or lead to greater import dependence.

RESULTS AND INTERPRETATION

Aggregate Trends in Domestic Linkages (Macro View)

	Avg BL^d	SD BL^d	Avg FL^d	SD FL^d
2010	1.7857326	0.31094	1.7857326	0.980862
2011	1.718736	0.296315	1.7187352	0.969669
2012	1.6930512	0.304471	1.6930536	0.891292
2013	1.697569	0.304675	1.6975676	0.901309
2014	1.7049314	0.327904	1.7049266	0.859516
2015	1.6645252	0.295243	1.6645248	0.736249
2016	1.629807	0.290805	1.629808	0.640181
2017	1.6790776	0.313539	1.6790772	0.776372
2018	1.685783	0.325939	1.6857824	0.772795
2019	1.7043828	0.336833	1.7043846	0.800847
2020	1.6958772	0.335934	1.6958764	0.76055
2021	1.7033178	0.350743	1.7033132	0.778873
2022	1.6956262	0.36527	1.6956256	0.776047

Table 1: Mean and standard deviation of domestic backward and forward linkages.

Table 1 shows the development of aggregate domestic backward and forward linkages in the Indian economy during 2010-2022, calculated as the average of sector-wise linkages across fifty different production sectors. It also presents the average linkage intensity and the linkage dispersion (standard deviation) for each year.

At the aggregate level, domestic backward and forward linkages remain very close to each other over time. The mean backward linkage falls from 1.79 in 2010 to nearly 1.70 in 2012, and then it stays within a narrow range for the next years, reaching about 1.70 again in 2022. Average forward linkages behave similarly to backward linkages, both in value and in time trend. This almost perfect correlation between the two is due not only to the accounting structure of the domestic Leontief inverse but also to the fact that, at the level of the total production system, the extent of mutual interdependence between sectors has hardly changed over the last ten years.

However, while mean linkage values change little, the fluctuation of linkages around the mean, or the dispersion of linkages across sectors, increases gradually over time. The standard deviation of backward linkages is up from around 0.31 in 2010 to 0.37 in 2022. Forward linkages display a similar behavior. Their standard deviation is high throughout the period and shows a somewhat increasing trend. The foregoing dilemma of a non-changing average and an increasing variation means that India's production structure changes not through a change in intersectoral linkages that is the same everywhere, but rather through different sectors becoming more distinct from one another.

The mid-2010s period is somewhat of a small turning point in this and similar respects. After a slight decline in average linkage intensity until 2015-16, both backward and forward linkages

remain steady as dispersion shows a more noticeable rise. This means that, on the one hand, the overall dependency level of the economy neither decreases drastically nor increases sharply, whereas, on the other hand, some industries become increasingly pivotal to domestic production networks, while the relative importance of others diminishes. It is also worth noting that the Covid-19 period does not break the structural trend in aggregate linkage intensity; instead, it merely underscores the ongoing pattern of divergence among sectors.

These broad trends indicate that structural changes have been marked more by differentiation than by the deepening of all structural components simultaneously. There is no continuous rise in the aggregate domestic linkage intensity in the Indian economy over the years, as seen from the chosen period. On the other hand, a combination of average linkages being stable and concentration growing points to the fact that the pattern of domestic interdependence is changed by alterations in the relative importance of different sectors, rather than by the whole economy's production linkages becoming stronger. Consequently, there is a call for closer sectoral scrutiny of backward and forward linkages, which follows in the next sections.

Sectoral Distribution of Backward Linkages

The evolution of the top sectors with high backward linkages is shown across three reference years: 2010, 2019, and 2022.

Sector	BL^d_2010	BL^d_2019	BL^d_2022
Motor vehicles, trailers and semi-trailers	2.25286	2.24045	2.42268
Food products, beverages and tobacco	2.10216	2.28219	2.23752
Fabricated metal products	2.05597	2.11177	2.21977
Manufacture of basic iron and steel	1.99416	2.16734	2.21277
Manufacture of other transport equipment	2.189	2.13742	2.1957
Electrical equipment	2.13312	2.03284	2.18554
Textiles, textile products, leather and footwear	2.20099	2.10448	2.17972
Paper products; printing and reproduction of recorded media	2.11231	2.06469	2.16413
Rubber and plastics products	2.01294	2.21769	2.16393
Machinery and equipment, nec	2.03204	1.98871	2.13553

Table 2: Top 10 sectors by backward linkage in 2022

Table 2 shows the domestic backward linkages for the 10 most backward-linked sectors in the Indian economy. The sectors are ranked according to their 2022 linkage intensity, and their linkage values are traced back to 2010 and 2019.

Backward linkages explain how much a sector's expansion leads to increased demand for inputs from other domestic sectors. Consequently, they indicate a sector's potential to foster upstream production activities.

One of the most noticeable aspects of the findings is that most of the manufacturing sectors occupy the top spots in the list of the most backward-linked activities. For all three benchmarking years,

the sector "motor vehicles, trailers and semi-trailers" stands out as having the highest backward linkage intensity. The linkage value of this sector has gone up from 2.25 in 2010 to 2.42 in 2022. The pattern shows that sector growth is associated with strong and expanding demand for a wide range of domestic intermediate inputs, thus establishing the sector as a cornerstone of upstream industrial activity.

Industries related to transport, such as the manufacture of other transport equipment, also have very high backward linkages that have persisted over time, with only slight changes. When these sectors are considered together, they confirm the central role of transport equipment manufacturing in India's domestic production network. This is evidence of the sector's close ties to metals, components, and ancillary industries.

Basic and fabricated metals are another sector cluster with strong backward linkages. The sectors of fabricated metal products and basic iron and steel manufacture have their backward linkages most evidently strengthened from 2010 to 2022. The backward linkage of basic iron and steel, in particular, goes up linearly during the whole period. This means that downstream industries are becoming increasingly dependent on local production of primary and semi-finished metal inputs. The explanation, in fact, is the deepening of industrial supply chains in heavy manufacturing.

Intermediate manufacturing sectors such as electrical equipment, machinery and equipment, and rubber and plastics products are also recurrent on the list of most backward-linked sectors. Their linkage values vary from year to year, but overall they remain higher than the economy-wide average. Their steady presence among the top sectors indicates they are major input-absorbing sectors that serve as bridges between various segments of the production system, from basic materials to final manufacturing activities.

The high backward linkage intensity in textiles and allied products persists and reflects the sector's extensive domestic input use in agriculture, chemicals, energy, and services. Although its backward linkage declines somewhat from 2010 to 2019, it rebounds in 2022. This means the sector can maintain the integrity of its domestic input structure as the economy undergoes structural changes.

Lastly, the fact that food products, beverages, and tobacco are among the most backward-linked sectors indicates that agro-processing activities remain a source of upstream demand. Looking at its backward linkage for the period from 2010 to 2019, there is a rise, followed by a slight decline by 2022. Hence, what the sector is experiencing is structural consolidation rather than uniform expansion or contraction of its input base.

Sectoral Distribution of Forward Linkages

The evolution of the top sectors with high forward linkages is shown across three reference years: 2010, 2019, and 2022.

Sector	FL^d_2010	FI^d_2019	FL^d_2022
Manufacture of basic iron and steel	3.28627	3.98284	4.66676
Financial and insurance activities	4.22372	4.31035	3.82315
Wholesale and retail trade; repair of motor vehicles	3.95497	3.63011	3.62887
Land transport and transport via pipelines	3.16461	3.25652	2.97271
Coke and refined petroleum products	5.39256	3.01186	2.81016
Chemical and chemical products	2.47399	2.66161	2.5812
Administrative and support services	1.99508	2.53554	2.49314
Electricity, gas, steam and air conditioning supply	3.33274	2.46157	2.48134
Agriculture and hunting	4.36511	2.62158	2.4005
Manufacture of basic precious and other non-ferrous metals	2.03962	1.73528	2.04528

Table 3: Top 10 sectors by forward linkage in 2022

Table 3 reports the domestic supply of inputs from sectors to other sectors, measured by the forward linkage of the ten most forward-linked sectors in the Indian economy, ranked by linkage intensity in 2022 and traced back to 2010 and 2019. Forward linkages are a measure of how much a sector sells its inputs to other domestic sectors and thus reflect its role as an upstream provider in the production network.

The findings show a sectoral composition that differs quite significantly from that of backward linkages. Indeed, backward linkages are heavily concentrated in the manufacturing sector, which in turn uses inputs from all sectors in the economy. On the other hand, the forward linkages focus on industrial sectors that provide basic inputs and on services that enable the economy as a whole. The manufacture of basic iron and steel is the leading forward-linked activity among sectors of the Indian economy, and its forward linkage has risen steadily from 3.29 in 2010 to 4.67 in 2022. This large increase means that steel is increasingly being used as an input by other industries, domestically produced steel is the major source of such inputs, and the sector is becoming the structural backbone of industrial production.

Numerous service sectors have also consistently exhibited strong forward linkage dominance. For the entire period considered, financial and insurance activities have been among the most forward-linked sectors, which is explained by their serving as intermediate inputs not only for final consumption but also for a wide range of production activities. In the same way, wholesale and retail trade, including the repair of motor vehicles, has been consistently highly forward-linked, indicating it is a critical distribution and coordination node linking producers and consumers throughout the economy.

Transport and energy-related sectors also make a major contribution to forward-linked activities. So, for example, land transport and transport via pipelines, along with electricity, gas, steam, and air conditioning supply, have had very high forward linkage values for the benchmark years. These sectors, despite declining linkage intensities between 2010 and 2022, still have considerably higher linkage intensities than the overall economy's average, and hence their importance as enabling inputs for both manufacturing and services has not diminished. The gradual reduction probably should not be interpreted as a loss in their systemic relevance but rather as efficiency gains or partial substitution.

Resource-based sectors have a different pattern from the rest of the sectors. For example, in 2010, coke and refined petroleum products had extremely high forward linkages, indicating that they were essential inputs across various sectors. However, the sharp decline in forward linkage values indicates the reduced dependence at the inter-sectoral level inside the domestic economy on refined petroleum products, due, for instance, to changes in energy usage, input mix, and production technologies. At the same time, agriculture, hunting, and the gathering of forest products also show a downward trend in forward linkage intensity over time, suggesting a general diminishment of the agriculture sector's direct role as an intermediate input provider to the rest of the sectors in the economy.

Chemical and chemical products, on the one hand, and basic precious and other non-ferrous metals, on the other hand, show a consistent moderate forward linkage value throughout the period. These industries still serve as intermediate input suppliers to downstream manufacturing across a broad range of activities, without undergoing major structural changes.

Sectoral Classification

The sectoral classification is based on Albert O. Hirschman's *The Strategy of Economic Development,* which itself reproduced the work of Chenery and Watanabe's *International Comparisons*. The sectors were divided into those above or below the mean value. There are four classifications:

Classification	Backward Linkage	Forward Linkage
Intermediate Manufacture	High	High
Final Manufacture	High	Low
Intermediate Primary Production	Low	High
Final Primary Production	Low	Low

Table 4: Industry Classification based on Chenery and Watanabe, "*International Comparisons*"

Sector	Classification in 2010	Classification in 2019	Classification in 2022
Agriculture and hunting	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Forestry and logging	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Mining of metal ores	Final Primary Production	Final Manufacture	Intermediate Primary Production
Coke and refined petroleum products	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Electricity, gas, steam and air conditioning supply	Intermediate Manufacture	Intermediate Primary Production	Intermediate Primary Production
Wholesale and retail trade; repair of motor vehicles	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Land transport and transport via pipelines	Intermediate Manufacture	Intermediate Manufacture	Intermediate Primary Production
Financial and insurance activities	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Administrative and support services	Intermediate Primary Production	Intermediate Primary Production	Intermediate Primary Production
Food products, beverages and tobacco	Intermediate Manufacture	Final Manufacture	Intermediate Manufacture
Paper products; printing and reproduction of recorded media	Intermediate Manufacture	Intermediate Manufacture	Intermediate Manufacture
Chemical and chemical products	Intermediate Manufacture	Intermediate Manufacture	Intermediate Manufacture
Rubber and plastics products	Final Manufacture	Final Manufacture	Intermediate Manufacture
Manufacture of basic iron and steel	Intermediate Manufacture	Intermediate Manufacture	Intermediate Manufacture
Manufacture of basic precious and other non-ferrous metals	Intermediate Primary Production	Intermediate Manufacture	Intermediate Manufacture
Motor vehicles, trailers and semi-trailers	Final Manufacture	Final Manufacture	Intermediate Manufacture
Construction	Final Manufacture	Intermediate Manufacture	Intermediate Manufacture
Fishing and aquaculture	Final Primary Production	Final Primary Production	Final Primary Production
Mining of coal and lignite	Final Primary Production	Final Primary Production	Final Primary Production

Extraction of crude petroleum and natural gas	Intermediate Primary Production	Final Primary Production	Final Primary Production
Other mining and quarrying	Final Primary Production	Final Manufacture	Final Primary Production
Mining support service activities	Final Primary Production	Final Primary Production	Final Primary Production
Wood and products of wood and cork	Final Manufacture	Final Primary Production	Final Primary Production
Building of ships and boats	Final Primary Production	Final Manufacture	Final Primary Production
Water transport	Final Primary Production	Final Primary Production	Final Primary Production
Warehousing and support activities for transportation	Final Manufacture	Final Manufacture	Final Primary Production
IT and other information services	Final Primary Production	Intermediate Primary Production	Final Primary Production
Real estate activities	Final Primary Production	Final Primary Production	Final Primary Production
Professional, scientific and technical activities	Final Primary Production	Final Primary Production	Final Primary Production
Public administration and defence; compulsory social security	Final Primary Production	Final Primary Production	Final Primary Production
Education	Final Primary Production	Final Primary Production	Final Primary Production
Human health and social work activities	Final Primary Production	Final Primary Production	Final Primary Production
Arts, entertainment and recreation	Final Manufacture	Final Primary Production	Final Primary Production
Other service activities	Final Primary Production	Final Primary Production	Final Primary Production
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	Final Primary Production	Final Primary Production	Final Primary Production
Textiles, textile products, leather and footwear	Final Manufacture	Final Manufacture	Final Manufacture

Pharmaceuticals, medicinal chemical and botanical products	Final Manufacture	Final Manufacture	Final Manufacture
Other non-metallic mineral products	Final Manufacture	Final Manufacture	Final Manufacture
Fabricated metal products	Final Manufacture	Intermediate Manufacture	Final Manufacture
Computer, electronic and optical equipment	Final Manufacture	Final Manufacture	Final Manufacture
Electrical equipment	Final Manufacture	Final Manufacture	Final Manufacture
Machinery and equipment, nec	Final Manufacture	Final Manufacture	Final Manufacture
Manufacture of other transport equipment	Final Manufacture	Final Manufacture	Final Manufacture
Manufacturing nec; repair and installation of machinery and equipment	Final Manufacture	Final Manufacture	Final Manufacture
Water supply; sewerage, waste management and remediation activities	Final Manufacture	Final Manufacture	Final Manufacture
Air transport	Final Manufacture	Final Manufacture	Final Manufacture
Postal and courier activities	Final Primary Production	Final Primary Production	Final Manufacture
Accommodation and food service activities	Final Manufacture	Final Manufacture	Final Manufacture
Publishing, audiovisual and broadcasting activities	Final Manufacture	Final Manufacture	Final Manufacture
Telecommunications	**Intermediate Manufacture**	**Final Manufacture**	**Final Manufacture**

Table 5: Sectoral Classification for 2010, 2019, and 2022

Table 5 shows how India's production sectors were classified in 2010, 2019, and 2022, using Hirschman's framework of backward and forward linkages. What really stands out is the remarkable structural persistence over this period; there hasn't been a wholesale transformation. In fact, many sectors kept their original classification across all three years. This tells us that the basic architecture of how sectors connect has stayed broadly stable, even through shifts in growth, policy changes, and external shocks.

Take core manufacturing, for example. Sectors like textiles, pharmaceuticals, electrical equipment, machinery, electronics, chemicals, paper, and basic iron and steel consistently held manufacturing roles, whether as final or intermediate producers. On the other hand, several primary activities, such as agriculture, forestry, fishing, coal mining, and many public and social services, remained firmly in primary production roles throughout. All this persistence suggests that, on an aggregate level, India's development path hasn't led to a widespread reorientation of sectoral roles within its production network.

At the same time, the table highlights **selective, meaningful structural transitions, particularly in** manufacturing. A small set of sectors, most notably motor vehicles, rubber and plastics products, and basic precious and other non-ferrous metals, shift from final manufacturing roles toward intermediate manufacturing positions by 2022. These transitions indicate a gradual deepening of domestic supply chains, with certain industries becoming more embedded as input providers to other production activities rather than serving only final demand.

On the other hand, some industries show reversals in or weakening of their structural roles. Production of wood products, shipbuilding, warehouses, and support services gradually lose their manufacturing labels and are classified as primary production, indicating the end of the deepening of the linkage phenomenon. Besides that, the sectors of food processing, construction, and metal ore mining exhibit classification changes that fluctuate without a clear directional trend, indicating structural ambiguity rather than consolidation.

Overall, the classification exercise points to an **uneven pattern of structural transformation**: selective deepening in specific industrial segments coexists with broad persistence and limited upgrading elsewhere. This combination of stability and partial reorientation has important implications for how effectively external demand shocks—such as those arising from trade integration can be transmitted through domestic production networks.

Import Structure of India from the European Union (2017–18 to 2024–25)

Commodity	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
Total	**43066.66**	**50863.19**	**45041.3**	**39716.21**	**51405.81**	**61054.88**	**61484.77**	**60681.15**
NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF.	8,512.16	9,709.93	9,142.12	7,399.59	9,796.70	11,008.88	12,901.73	13,013.35
ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS,AND PARTS.	3,990.52	4,388.26	3,618.41	3,206.88	4,215.16	7,548.38	10,227.29	9,397.35
AIRCRAFT, SPACECRAFT, AND PARTS THEREOF.	4,001.59	5,001.72	4,838.95	4,750.79	4,075.79	4,787.58	5,446.32	6,278.76
OPTICAL, PHOTOGRAPHIC CINEMATOGRAPHIC MEASURING, CHECKING PRECISION, MEDICAL OR SURGICAL INST. AND APPARATUS PARTS AND ACCESSORIES THEREOF;	2,342.18	2,769.94	2,693.41	2,319.78	2,916.30	3,163.85	3,618.86	3,834.41
PLASTIC AND ARTICLES THEREOF.	1,980.67	2,059.70	1,817.15	1,738.08	2,424.46	2,651.19	2,174.02	2,344.91
NATURAL OR CULTURED PEARLS,PRECIOUS OR SEMIPRECIOUS STONES,PRE.METALS,CLAD WITH PRE.METAL AND ARTCLS THEREOF;IMIT.JEWLRY;COIN.	4,431.05	6,996.10	5,515.63	3,755.30	6,129.37	5,045.08	3,043.27	2,325.22
ORGANIC CHEMICALS	1,939.01	2,283.81	2,248.19	2,348.24	2,448.59	2,337.53	2,244.92	2,289.49
VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLING STOCK, AND PARTS AND ACCESSORIES THEREOF.	1,580.54	1,623.21	1,119.34	922.38	1,495.09	1,822.75	2,003.41	2,087.55
MISCELLANEOUS CHEMICAL PRODUCTS.	1,093.69	1,141.90	1,117.50	1,246.82	1,487.31	1,566.46	1,561.16	1,632.35

Table 6: Top 10 sectors by Indian import from EU by trade amount in million USD

India's imports from the European Union show a marked and enduring pattern of capital- and technology-intensive bias during the period 2017, 18 to 2024, 25. Even though there was a significant drop in trade due to the COVID-19 situation (2020, 21), total imports increase from USD 43.1 billion in 2017, 18 to above USD 60.6 billion by 2024, 25. This recovery highlights not only the cyclical trade fluctuations but more importantly the structural nature of India's reliance on capital goods and advanced intermediates of EU origin.

New nuclear reactors, boilers, machinery and mechanical appliances (HS 84) are the single largest import item throughout the period according to the trade data. The value of the imports in this item grows from USD 8.5 billion in 2017, 18 to be more than USD 13.0 billion by 2024, 25, in spite of a pandemic-related downturn in 2020, 21. The sustained increase in machinery imports is a sign that India depends heavily on EU technology for its main industrial processes, infrastructure projects, and manufacturing upgrades. In the later years of the period, this category alone makes up about 20% of the total imports from the EU.

The electrical machinery and equipment category shows the most significant post-pandemic growth after machinery. The import volume starts at USD 3.2 billion during 2020–21 and grows to more than USD 10.2 billion in 2023–24 before showing minor reductions during 2024–25. The sharp increase demonstrates India's rising need for imported electrical components and control systems and advanced electronics because these materials serve essential functions in various industries including automotive and renewable energy and telecommunications and industrial automation.

The category of aircraft, spacecraft, and parts thereof functions as another vital structural element. The import volume shows a steady upward trend, which increases from USD 4.0 billion in 2017–18 to more than USD 6.3 billion in 2024–25. The trade compression periods prove that India lacks the ability to produce high-technology aerospace systems because civil aviation and defense procurement depend on European suppliers' strategic importance.

The imports of optical medical and precision instruments show continuous growth between two periods because they increased from USD 2.3 billion to almost USD 3.8 billion. The trend demonstrates that the healthcare, scientific research, and advanced manufacturing sectors depend on high-precision equipment from Europe because they only have limited capacity to produce domestic alternatives.

In the industrial sector, intermediate products such as plastics and plastic articles, organic chemicals, and miscellaneous chemical products are the main components of the EU's import structure. Imports of organic chemicals remain steady at over USD 2.2 billion annually, while imports of plastics post a remarkable surge after 2021, 22, thus pointing to the EU as the provider of high-grade chemical inputs, on which pharmaceuticals, packaging, automotive components, and consumer goods manufacturing are highly dependent.

The importation of natural or cultured pearls and precious or semi-precious stones has been on a downward trend after 2018, 19, thus hinting at a possible partial domestic sourcing of these items or changes in processing trade patterns. On the other hand, imports of iron and steel increase significantly after 2021, 22, surpassing the USD 2.0 billion mark before possibly easing in 2024, 25, thus reflecting a cyclical dependence on infrastructure and capital investment cycles.

Export Structure of India from the European Union (2017–18 to 2024–25)

Commodity	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
	43906.87	47862.97	44991.02	41359.93	64963.55	74836.51	75925.3	75854.24
MINERAL FUELS, MINERAL OILS AND PRODUCTS OF THEIR DISTILLATION; BITUMINOUS SUBSTANCES; MINERAL WAXES.	2,969.84	5,796.55	5,798.70	2,869.27	8,918.68	15,625.82	19,196.31	15,014.48
ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS,AND PARTS.	1,771.60	2,228.07	2,314.00	3,122.39	4,593.21	7,778.00	7,966.96	11,250.03
ORGANIC CHEMICALS	3,211.74	3,729.65	3,800.57	4,230.18	5,368.13	5,635.06	5,012.68	5,074.09
NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF.	3,569.77	4,031.07	3,763.99	3,474.41	4,672.98	5,116.86	5,240.46	5,035.85
IRON AND STEEL	3,060.52	2,519.03	2,042.51	2,543.78	5,965.40	4,109.16	4,692.46	3,045.58
PHARMACEUTICAL PRODUCTS	1,257.93	1,335.83	1,592.55	1,888.17	2,150.77	2,717.17	2,878.73	2,951.53
NATURAL OR CULTURED PEARLS,PRECIOUS OR SEMIPRECIOUS STONES,PRE.METALS,CLAD WITH PRE.METAL AND ARTCLS THEREOF;IMIT.JEWLRY;COIN.	2,912.69	3,028.59	2,731.18	1,842.95	3,490.21	3,619.44	2,970.43	2,522.95
ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, NOT KNITTED OR CROCHETED.	2,380.68	2,260.89	2,066.18	1,591.51	1,940.65	2,308.44	2,151.01	2,285.43
ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, KNITTED OR CORCHETED.	2,314.93	2,333.28	2,093.71	1,757.63	2,232.12	2,275.90	1,927.95	2,268.36
VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLING STOCK, AND PARTS AND ACCESSORIES THEREOF.	2,162.64	1,960.99	1,590.88	1,412.01	2,007.39	2,163.57	2,301.73	2,218.30

Table 7: Top 10 sector by Indian export to EU by trade amount in million USD

The export patterns from India to the European Union during the years from 2017 to 2024 show a completely different trade pattern than their import trade with the union. The European Union trade relationship with India shows an uneven trade pattern because India exports mainly goods that need many workers to produce, basic materials, and specific technology products, while the European Union imports capital goods and high-technology products.

Textiles and apparel, which include knitted and non-knitted garments, made-up textile articles, carpets, and other textile floor coverings, produce significant trade surpluses throughout the entire duration of the study. The sectors maintain strong performance during worldwide disruptions, which include the COVID-19 pandemic, because they possess established production processes and extensive domestic supplier networks. India maintains its strong position in labor-intensive manufacturing through the EU market because the country produces goods that enable it to maintain trade surpluses with the European Union.

The group of leather goods, footwear, and travel articles creates another steady stream of surplus income for the company. The sectors maintain a positive balance throughout the entire time period because their annual values show only minor changes, which demonstrate that European customers continue to demand Indian consumer products while Indian manufacturers depend only on a few European materials to create their products.

Pharmaceutical products function as essential components that support the export activities of the economy. The economy shows steady export growth, which started after the pandemic and resulted in ongoing trade surpluses, which provide economic benefits. The pharmaceutical industry demonstrates partial value growth through its combination of technological capacity, regulatory compliance, and production efficiency. The industry shows strong performance because its domestic backward linkages enable production growth which connects to international production systems.

The agricultural sector and agro-processing sector export agricultural products, which include cereals, marine products, spices, tobacco, and processed food items, to maintain positive trade balances. These sectors maintain export stability because they operate under volatile price and demand conditions, which become worse during periods when global markets reduce their demand.

The export volumes of engineering-intensive and capital-goods products, which include machinery and transport equipment, electronics, and precision instruments, do not generate permanent trade surpluses with all their export growth. The growth in these categories occurs together with EU component and capital good imports, which equal or exceed their actual product growth. The business model indicates that the organization assembles products instead of producing complete domestic products.

It is important to note that the growth in trade value has been somewhat affected by the recent hikes in exports of Indian refined petroleum products to the EU. It is therefore important to see how much those exports contribute to India's trade surplus in the balance of payments.

Balance of Payments and Energy Decomposition in India–EU Trade

	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
Overall Surplus	840.21	-3000.22	-50.28	1643.72	13557.74	13781.63	14440.53	15173.09
Energy Surplus	1926.77	4806.89	5013.59	1868.26	7242.5	11414.81	17443.02	14138.82
Net Surplus without energy	-1086.56	-7807.11	-5063.87	-224.54	6315.24	2366.82	-3002.49	1034.27

Table 8: India's Trade Surplus with the EU with and without energy products' exports

The research shows that energy trade, especially mineral fuels and related products under HS 27, dominates the financial outcomes of India-European Union trade relations. The trade surplus needs to be divided into energy and non-energy sections because this process enables analysts to study industrial growth patterns and actual price movements.

India's trade balance with the EU shows significant fluctuations over the years 2017 to 2025. The total balance moves between surplus and deficit until 2020-21, after which it achieves strong positive results starting in 2021-22. The post-pandemic improvement seems obvious, but it contains important changes that become visible when energy trade is analyzed separately.

The energy trade shows a continuous pattern of generating substantial positive surpluses, which increase from 1.9 billion US dollars in 2017-18 to 17.4 billion US dollars in 2023-24 and decrease to 14.1 billion US dollars in 2024-25. The post-pandemic energy price increases and international energy market disruptions have created this surge in energy prices. Price changes and refining profit margins create these market movements, which industrial structural changes and technological advances within India do not influence.

A complete transformation happens after the energy element is taken away. The non-energy trade balance shows continuous weak performance, which results in negative values throughout most of

the timeframe. India experienced significant non-energy deficits, which reached their peak at USD -7.8 billion during the 2018-19 period. The non-energy balance maintained its slight negative value throughout 2020-21 despite the overall trade environment becoming more restricted.

The non-energy balance achieves positive results during the 2021-22 and 2022-23 periods, but this represents only a short-term positive development. The progress that occurs cannot maintain itself while continuing to grow. The non-energy balance shows a rapid return to deficit status at USD -3.0 billion for 2023-24 before showing a slight recovery to USD 1.0 billion in 2024-25. The energy surplus grows consistently throughout the entire period, creating a sharp contrast with the unpredictable energy surplus.

The analysis shows that all post-2021 surpluses result from refined petroleum production. The EU trade balance with India would have remained unstable because the country needed to import capital goods, machinery, electronics, chemicals, and precision instruments, which were not covered by HS 27. Energy trade serves as a statistical control mechanism that increases reported surplus figures while failing to address the fundamental problems within the industrial sector.

Sectoral Implications of the India–EU Free Trade Agreement

The India-EU Free Trade Agreement (FTA), which India and the European Union have proposed, exists as an unbalanced treaty because it demonstrates the different manufacturing abilities, technological expertise, and regulatory frameworks that India and the European Union possess. The research findings, which analyze domestic intersectoral linkages and trade patterns and balance-of-payments decomposition results, enable researchers to systematically identify which sectors will benefit from this study while they simultaneously identify barriers that will restrict the actual benefits.

Sectors Likely to Benefit the European Union

The EU's comparative advantage lies overwhelmingly in **capital, technology, and regulation-intensive sectors**, which also dominate India's import basket from the EU. These include:

- Machinery and mechanical appliances (HS 84)
- Electrical machinery and electronics (HS 85)
- Aircraft, spacecraft, and parts (HS 88)
- Optical, medical, and precision instruments (HS 90)
- Advanced chemicals, plastics, and specialty inputs

India maintains ongoing trade deficits in these sectors which include energy trade but exhibit two main trade deficits which keep increasing. The sectors function as crucial elements which link different economic parts, because they provide vital resources needed for production processes that span manufacturing and infrastructure and energy and services sectors in India.

Tariff reductions and regulatory harmonization under an FTA framework will reduce EU export expenses for these sectors, which will result in higher import levels throughout these markets. The lack of domestic technological resources in India means that the country cannot effectively implement liberalization because its advanced technological sectors do not possess sufficient domestic manufacturing capacity. The country will continue its current position as a downstream user of European capital goods, while the system will not produce any domestic capital.

The balance-of-payments analysis shows that unregulated liberalization in these sectors will have negative effects on India, as it will lead to a larger non-energy trade deficit, making the country more susceptible to international economic crises.

Sectors Likely to Benefit India

India's export strengths lie in sectors characterized by **labor intensity, scale advantages, and relatively strong domestic backward linkages**. These include:

- Textiles and apparel (HS 61–63)
- Leather goods, footwear, and travel articles
- Carpets and other textile floor coverings
- Agro-based products, marine products, spices, tobacco, and processed foods
- Pharmaceutical products

India maintains trade surpluses with these sectors because they withstand international economic disruptions. The sector's export growth creates domestic job opportunities and generates local economic activity through increased demand for domestic products.

The pharmaceutical industry presents a complex development opportunity. The Indian export market has strong potential, but the sector relies on imported intermediate goods and faces significant regulatory risks. The FTA provides Indian pharmaceuticals with their best opportunity to enhance their value chain involvement in technology-focused industries.

The process of deriving benefits from surplus-producing industries requires multiple steps. The European Union market grants entry through both tariff restrictions and non-tariff barriers, which include standards and regulatory requirements.

Balance-of-Payments Implications of Sectoral Liberalization

The energy–non-energy decomposition conducted in this research study serves as an essential method for understanding how the FTA affects macroeconomic outcomes. Recent years have seen trade surpluses, which result from energy-related trade (HS 27) that operates according to price mechanisms from external sources.

India maintains a weak trade relationship with the EU because the exclusion of energy trade has led to ongoing structural weaknesses. The balance of payments will experience pressure from the proposed liberalization, which enables larger capital- and technology-intensive sector imports without matching export growth in non-energy products.

The FTA creates a macro-structural threat that will expand the non-energy deficit despite temporary trade volume and total surplus growth.

The Role of Standards and Regulatory Constraints

India cannot fully exploit its FTA export opportunities because European Union standards and regulatory systems are the main constraints. The European Union uses sanitary and phytosanitary (SPS) measures, technical barriers to trade (TBT), environmental regulations, labor standards, and product traceability requirements to impose restrictions on market entry.

The compliance costs for labor-intensive and agro-based sectors create a major financial burden, particularly affecting small and medium producers. The environmental and labor compliance requirements in textiles, apparel, and leather restrict the growth potential of businesses because they export their products. SPS standards in agriculture and food processing create entry barriers that exist despite nominal tariff liberalization.

The European Union regulatory framework for pharmaceuticals and chemicals requires businesses to spend significant resources on certification, testing, and documentation processes. Smaller producers face the risk of exclusion from the market, while larger Indian companies will gain advantages, and export growth will become concentrated among a few businesses.

The standards will decide which potential advantages become actual advantages for India, despite its established comparative advantages. The FTA will only assist a small group of Indian producers because it needs domestic testing facilities, certification organizations, and compliance support systems to operate effectively.

Implications for FTA Design

The evidence indicates that the India-EU FTA should adopt a selective and sequential approach rather than a comprehensive and symmetric framework. The EU benefits from quick trade liberalization because it enables the EU to use its core advantages, while India benefits from trade agreements only when its domestic development and regulatory strength reach certain levels.

The agreement for India needs to establish multiple goals that should be achieved through different priorities. The agreement should implement forward-linked commitments in sectors that Indian industries expect to experience capacity shortages. The standards harmonization process should establish domestic capacity requirements that companies must meet rather than treat them as a basic compliance obligation. The agreement should categorize energy-related surpluses as temporary elements that will not be used to support additional market opening in other areas.

The FTA creates its developmental impact through trade expansion, which depends on the compatibility of trade regulations with India's production methods and balance-of-payments limitations, which this study has established.

CONCLUSION

This study examined the proposed India-EU Free Trade Agreement and its potential implications for trade, with particular attention to the underlying structure of India's economy. To determine whether closer ties with the EU would strengthen India's production capabilities, we examined intersectoral linkages, sector-by-sector trade data, and balance-of-payments figures.

What we found is that India's economic development is following an uneven path. On the one hand, there are strong domestic connections in areas such as labor-intensive manufacturing and agro-processing, as well as in some resource-based industries. On the other hand, sectors that are more capital- and technology-driven, such as machinery, electronics, advanced chemicals, and transport equipment, aren't as well integrated into the domestic market. Interestingly, trade patterns with the EU mirror this imbalance almost perfectly. The sectors where India exports more than it imports tend to have robust local supply networks. Meanwhile, the sectors that rely heavily on imports from the EU show strong forward linkages but haven't yet built up sufficient domestic production capacity to match. The trade analysis reinforces this structural interpretation. The energy-non-energy analysis shows that India has made trade progress in recent years because aggregate trade balances indicate better results. The energy trade under HS 27 accounted for most of the trade improvement between 2016 and 2018. India has a weak trade relationship with the EU because non-energy imports of capital goods, electronics, chemicals, aircraft, and precision instruments have led to persistent trade deficits. Energy-driven surpluses, which depend on price fluctuations driven by external factors, create a false impression of industrial strength by masking ongoing industrial dependency.

Looking at evidence across sectors, the India-EU trade deal is likely to create uneven advantages. The EU would come out ahead mainly in capital- and technology-heavy sectors, where India has long relied on imports. India's wins, on the other hand, are mostly in labor-intensive manufacturing, agricultural products, and pharmaceuticals. But to really tap into those strengths, India has to navigate the EU's strict standards and regulations, which currently hold it back. Simply cutting tariffs won't be enough to open markets or boost domestic value; it will take more than that.

The study shows that the final impact of this FTA hinges on how the treaty is designed and rolled out. For India, the real economic benefits would come from sectors with strong backward linkages, but only if market access there is opened in a controlled way. Meanwhile, forward-linked sectors face automatic opening, which could actually increase their reliance on foreign inputs and add to payment balance risks. All told, the agreement risks exacerbating existing structural imbalances between the two economies. For the Indian industry to move forward, companies will need to build up their own capabilities, backed by the right regulatory support.

The study demonstrates that trade policy needs to align with domestic sector connections, non-energy balance-of-payments limits, and institutional capacity to meet regulatory requirements. The European Union can only help India achieve its development goals through deeper integration if both parties establish conditions that prevent current dependency patterns from continuing.

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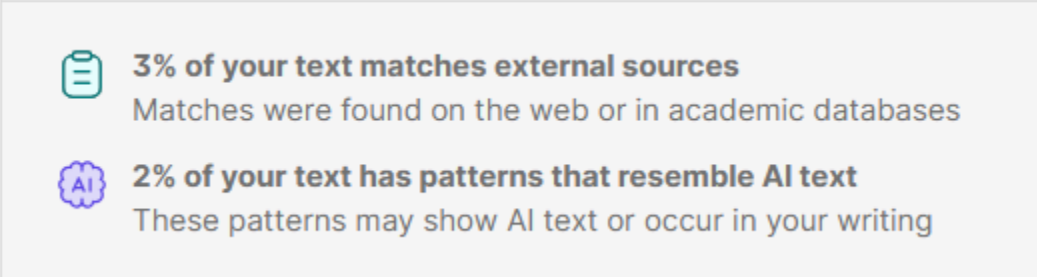
AI and Plagiarism



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