

Oil Imports and Their Implications for India's Trade Balance

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Abstract:

This study examines the patterns and structure of India's external trade, focusing on the relationship between oil imports and the overall trade balance. India has consistently seen a disparity between imports and exports over the years, making the trade imbalance a significant area of economic concern. At the same time, the nation's high reliance on oil imports has made it more vulnerable to changes in world prices and external shocks. Against this backdrop, the study aims to understand whether there is a meaningful difference between exports and imports and to explore the extent to which oil imports influence the trade balance. Using secondary data obtained from the Reserve Bank of India, the analysis applies statistical tools to identify underlying trends and relationships within the data. The findings point toward a structural imbalance in India's trade patterns and highlight the significant role of energy imports in shaping external sector outcomes. By bringing together these aspects, the study offers a clearer and more practical understanding of India's trade dynamics and the key factors influencing its trade deficit.

Data were collected for the years 2016-2025.

Keywords:

- Trade Balance
- Exports
- Imports
- Oil Imports
- External Trade

Introduction:

India's external trade has undergone a significant transformation over the past few decades, emerging as a key driver of economic growth and global integration. For much of its economic history, trade has been characterized by a developing export base alongside a growing dependence on imports to meet domestic demand. This imbalance, shaped by factors such as rising consumption, industrial growth, and reliance on essential commodities, has resulted in a persistent trade deficit. In this context, external trade not only reflects India's participation in the global economy but also highlights underlying structural challenges.

With increasing globalization, both exports and imports have expanded significantly. While exports have diversified across sectors, imports have continued to grow at a faster pace, leading to a widening gap between the two. This raises important concerns regarding trade competitiveness and economic stability. A major contributor to this imbalance is India's dependence on oil imports. As one of the largest importers of crude oil, the country

is highly vulnerable to global price fluctuations. Changes in oil prices directly affect the import bill and, consequently, the trade balance. In addition to these structural factors, it is important to approach the study of trade patterns through a quantitative lens. Statistical tools such as hypothesis testing and regression analysis help move beyond simple observation and allow for a more precise understanding of relationships between variables. By identifying whether differences and trends are statistically significant, such methods strengthen the reliability of conclusions and provide a more scientific basis for economic analysis.

This study analyzes the relationship between oil imports and the overall trade balance. Using data from the **Reserve Bank of India**, the study applies statistical tools to provide a clearer understanding of India's trade patterns. Overall, it highlights the structural nature of the trade deficit and emphasizes the important role of oil imports in shaping India's external sector.

Literature review

IRJMETs (2025), *India's Balance of Payments and Import Structure* examines the connection between petroleum imports, India's trade deficit, and the current account balance. The study reports that during 2022–23, petroleum, oil, and lubricants (POL) imports accounted for nearly \$112 billion of India's total goods trade deficit of \$265.3 billion. Despite this, the Current Account Deficit (CAD) declined from 2.0% of GDP in 2022–23 to 0.7% in 2023–24, largely due to a reduction in the goods trade deficit and a rise in the services surplus. This research is significant because it measures the substantial role of oil imports in shaping India's external imbalance, reinforcing the view that petroleum trade remains a major source of macroeconomic vulnerability.

Manish and Rathore, V. (2026), *India's Search for Energy Security: Diversifying External Sources and Promoting Green Transition*, published in a SAGE journal, explores India's combined approach of expanding oil import sources while simultaneously advancing renewable energy initiatives. The study finds that although domestic green energy policies possess strong potential, external diversification efforts are constrained by geopolitical rivalries within the Indo-Pacific region. Furthermore, the transition toward green energy faces domestic challenges, including infrastructural limitations and technological deficiencies. The paper is relevant as it emphasizes how geopolitical dynamics influence India's oil import decisions and consequently shape the pattern of its external oil trade.

Singh, K. and Jana, S. K. (2024), *A Study on Energy Import Dependency in India*, published as an MPRA working paper, investigates India's dependence on imported conventional energy sources, particularly crude oil, using data spanning 2006–2020. The study reveals a significant reliance on imported fossil fuels and argues that greater adoption of renewable energy is essential for improving both economic stability and environmental sustainability. This research is important because it identifies crude oil dependence as a long-term structural issue with implications for foreign exchange reserves and sustainable development.

Standing Committee on Petroleum and Natural Gas (2023), *Review of Policy on Import of Crude Oil*, presented to the Indian Parliament, assesses India's crude oil import framework and proposes policy reforms. The Committee noted that around 87% of India's crude oil requirements in 2022–23 were met through imports and recommended measures to diversify sourcing and reduce excessive dependence on the Middle East, a region often affected by geopolitical instability and supply disruptions. This report is particularly relevant because it demonstrates official recognition of the strategic risks linked to India's oil import dependence and outlines policy measures aimed at restructuring import patterns.

Objectives

- To analyse the relationship between oil imports and India's overall trade balance.
- To assess the extent to which oil imports contribute to India's trade deficit and external sector imbalance.
- To study the impact of India's dependence on oil imports
- To shed light on the structural aspects of India's trade imbalance and highlight the significance of lowering reliance on imports to create a more balanced external sector.

Research methodology-

This study employs a quantitative research methodology to analyze India's external trade of oil, focusing on the relationship between oil imports and the overall trade balance. Secondary data were collected from the Reserve Bank of India, encompassing relevant time series data on India's exports, imports, trade balance, and oil import values.

The methodology involves Regression Analysis: A linear regression model was developed to investigate the impact of oil imports on India's trade balance. In this model, oil imports (measured in US dollars) serve as the independent variable, while the trade balance (also in US dollars) is the dependent variable. The regression analysis evaluates the strength and significance of the relationship between these variables, with key statistics including the coefficient of determination (R^2), p-values, beta coefficients, and t-values used to interpret the results.

The hypotheses tested are:

1. Null Hypothesis (H_0): There is no significant relationship between oil imports and trade balance.
2. Alternative Hypothesis (H_1): There is a significant relationship between oil imports and trade balance.

Data analysis was performed using appropriate statistical software to calculate correlation coefficients, regression coefficients, and test statistics. The significance level was set at 0.05 for all hypothesis tests. The model's explanatory power and statistical significance were assessed using ANOVA and regression diagnostics.

The following regression model is obtained:

$$\text{Trade balance} = 8687.05 - 1.38 \cdot \text{Imports of oil}^*$$

**All values are measured in US\$ billion.*

A linear regression analysis was conducted to examine the influence of oil imports on the trade balance. In this analysis, oil imports in US dollars were considered the independent variable, while trade balance in US dollars was taken as the dependent variable. The purpose of the regression analysis was to study the effect of oil imports on the overall trade balance.

Analysis

Variable	Value
r-value	-0.96
p- Value	<0.001
B	-1.38
Beta	-0.96
T-value	-9.08
f-value	83.43
Decision on H ₀	Rejected

Table no. 1

Table No. 1 shows the results of the regression analysis performed. Since the p-value is less than 0.05, the null hypothesis (H₀) is rejected. Therefore, it can be concluded that there is a significant relationship between oil imports and trade balance. The regression model showed that oil imports (in \$) explained 92.17% of the variance in the variable Trade balance. An ANOVA was used to test whether this value was significantly different from zero. Using the present sample, it was found that the effect was significantly different from zero, $F=83.43$, $p < .001$, $R^2 = 0.92$. The model estimates that a one-billion-dollar increase in oil imports is associated with a deterioration of approximately 1.38 billion dollars in the trade balance. The intercept of 8,687.05 represents the theoretical trade balance when oil imports are zero.

Figure 1, given below, shows a clear negative relationship between **oil imports** and **trade balance**. As oil imports increase, the trade balance becomes more negative, indicating a larger trade deficit. This suggests that higher oil import costs contribute significantly to worsening India's trade balance. Since India is heavily dependent on imported oil, increases in oil imports place pressure on foreign exchange reserves and widen the gap between exports and imports. The downward trend in the graph supports the conclusion that oil imports have a strong influence on India's trade deficit.

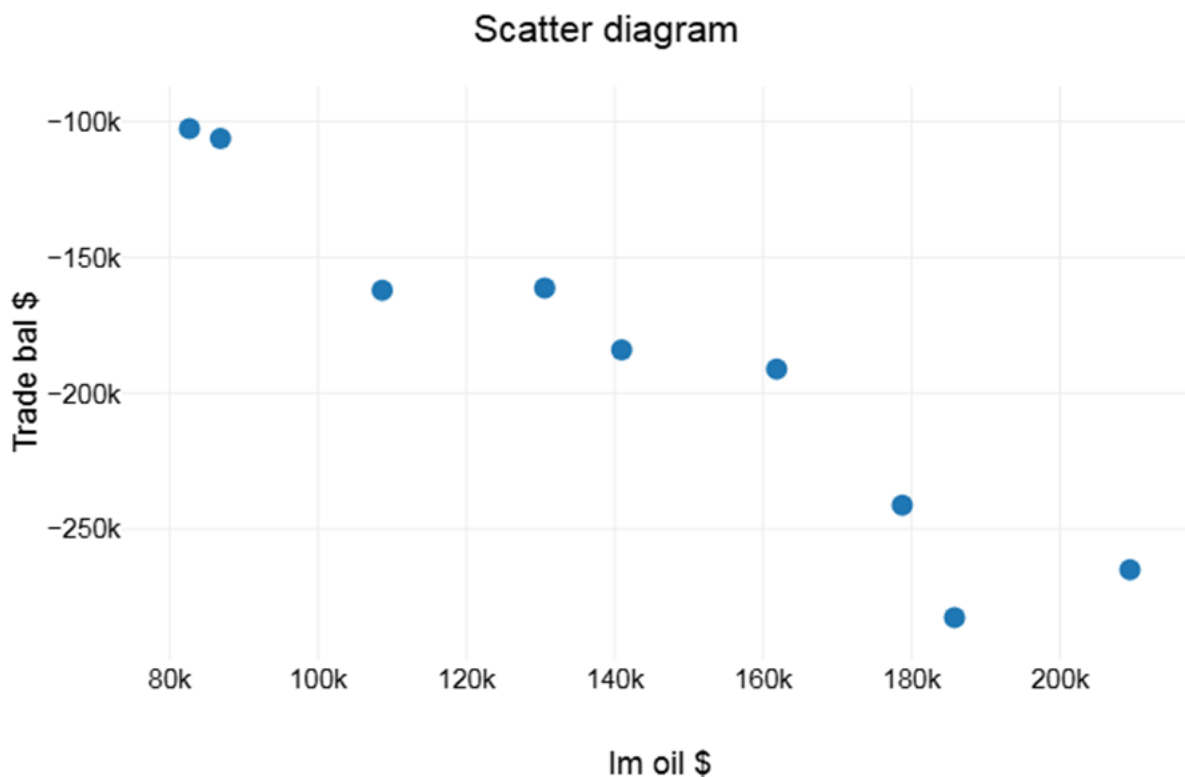


Figure no. 1

High oil import volumes negatively affect the trade balance by increasing import costs relative to exports, thus widening the trade deficit. Dependence on imported oil exposes the economy to global price volatility, raising import expenditures and reducing net exports. Additionally, large oil import payments divert foreign exchange reserves from productive or export-oriented investments, worsening the trade imbalances and risking economic stability.

Suggestions

1. **Diversify Oil Import Sources:** To mitigate vulnerability to global price fluctuations and geopolitical risks, India should diversify its crude oil import sources beyond the Middle East, in alignment with recommendations from the Standing Committee on Petroleum and Natural Gas.
2. **Promote Renewable Energy:** Accelerating the adoption and development of renewable energy alternatives is essential to reduce long-term dependence on imported fossil fuels, thereby enhancing economic stability and sustainability.
3. **Strengthen Trade Competitiveness:** The implementation of policies aimed at boosting export growth and diversification will contribute to narrowing the trade deficit and improving the overall trade balance.
4. **Enhance Infrastructure and Technology:** Investment in infrastructure and technological advancements is necessary to support both the transition to green energy and the improvement of trade logistics efficiency.

5. Continuous Monitoring and Policy Adjustment: Regular assessment of trade patterns and oil import dependencies through quantitative methods is crucial to inform adaptive policy measures that address structural imbalances effectively.
6. Encourage Domestic Production: Supporting domestic production of energy and essential commodities will help reduce import reliance and improve foreign trade performance.

Limitations

1. Reliance on Secondary Data: This study is based exclusively on secondary data obtained from the Reserve Bank of India, which may constrain the analysis to the availability and scope of recorded variables and specific time periods.
2. Focus on Oil Imports Only: The research concentrates solely on oil imports, without incorporating other significant import categories that could also impact the overall trade balance.
3. Limited Time Frame: The selected period for analysis may not adequately capture longer-term trends or recent policy developments that influence trade dynamics.
4. Simplified Analytical Model: The linear regression model employed considers only oil imports as an independent variable, potentially omitting other relevant factors that affect the trade balance.
5. Absence of Qualitative Insights: The study primarily utilizes quantitative methods, which may not fully reflect the geopolitical, policy-related, or market complexities influencing India's trade patterns.
6. Exclusion of External Shocks: The model does not explicitly account for external shocks, such as global economic crises or abrupt changes in demand, which could significantly affect trade outcomes.
7. Use of a Simple Linear Regression Model: The study employs a simple linear regression model with oil imports as the sole independent variable. As a result, the regression coefficient may indicate a very strong influence of oil imports on the trade balance, as other relevant determinants have not been included in the analysis. Future research may use multiple regression analysis to examine the combined impact of additional factors such as non-oil imports, exports, exchange rates, global oil prices, and economic growth on the trade balance.

Conclusion

The analysis of India's external trade reveals a persistent structural imbalance characterized by a significant gap between exports and imports. This study confirms that oil imports play a critical role in shaping the trade balance, with a strong and statistically significant negative relationship between oil import values and the overall trade position. The heavy reliance on crude oil imports exposes the Indian economy to global price volatility and geopolitical risks, underscoring the need for strategic diversification of import sources and a transition towards renewable energy alternatives. Furthermore, enhancing trade competitiveness through export diversification, investing in infrastructure and technology, and encouraging domestic production are essential to achieving a more balanced and sustainable external sector. Continuous monitoring and adaptive policy measures based on quantitative analysis remain vital for addressing these structural challenges effectively. Overall, mitigating dependence on oil imports and fostering a resilient trade framework are imperative for improving India's economic stability and external trade performance.

Bibliography:

International Monetary Fund. (n.d.). *Direction of trade statistics*. <https://www.imf.org>

International Research Journal of Modernization in Engineering Technology and Science. (2025). *India's balance of payments and import structure*. IRJMETs.

Manish, & Rathore, V. (2026). *India's search for energy security: Diversifying external sources and promoting green transition*. SAGE Journals.

Reserve Bank of India. (n.d.). *Handbook of statistics on the Indian economy and RBI Bulletin*. <https://www.rbi.org.in>

Singh, K., & Jana, S. K. (2024). *A study on energy import dependency in India* (MPRA Working Paper). Munich Personal RePEc Archive.

Standing Committee on Petroleum and Natural Gas. (2023). *Review of policy on import of crude oil*. Parliament of India.

Department of Commerce, Government of India. (n.d.). *Export-import data bank*. <https://tradestat.commerce.gov.in>

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