



TARIFFS, TRADE REMEDIES, AND ANTI-DUMPING MEASURES: IMPLICATIONS FOR INTERNATIONAL TRADE-WITH SPECIAL REFERENCE TO INDIA AND THE ANTI-DUMPING DUTY MODEL

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ABSTRACT

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This study examines the role of tariffs, trade remedies, and anti-dumping measures in international trade with special reference to India and the Anti-Dumping Duty Model. Using secondary data collected from WTO, DGTR, RBI, World Bank, UNCTAD, and the Ministry of Commerce for the period 2015–2024, the study analyzes the impact of tariff rates and anti-dumping duties on trade performance. Pearson's correlation, paired sample t-test, and multiple regression analysis were employed to assess relationships among trade policy variables and trade volume. The findings reveal that tariff rates and anti-dumping duties significantly influence trade volume in India. The paired t-test indicates a significant reduction in imports following the imposition of anti-dumping duties, supporting the applicability of the Anti-Dumping Duty Model. Regression results further confirm that tariffs and anti-dumping measures significantly affect trade flows and domestic industry protection. The study concludes that these measures are effective trade policy instruments but require careful implementation to balance fair trade, economic welfare, and global competitiveness.

KEYWORDS: Tariffs, Trade Remedies, Anti-Dumping Duties, International Trade, India, Anti-Dumping Duty Model, Trade Volume, WTO.

INTRODUCTION

International trade has long been recognized as a powerful engine of economic growth, efficiency, and development. By enabling countries to specialize according to their comparative advantages, trade facilitates optimal resource allocation, technological diffusion, and consumer welfare. In the post-World War II period, multilateral institutions such as the General Agreement on Tariffs and Trade (GATT) and later the World Trade Organization (WTO) have actively promoted trade liberalization by reducing tariff barriers and discouraging discriminatory trade practices. Despite these efforts, governments across the world continue to intervene in international trade through various policy instruments, most notably **tariffs, trade remedies, and anti-dumping measures**.

Tariffs represent one of the oldest and most widely used tools of trade policy. They are imposed as taxes on imported goods with the objective of protecting domestic industries, generating government revenue, and correcting balance of payments imbalances. Although tariff levels have declined significantly under successive rounds of trade negotiations, they continue to influence trade patterns, especially in developing countries. Tariffs raise domestic prices, reduce import volumes, and alter

consumption and production decisions, thereby affecting overall economic welfare.

Alongside tariffs, **trade remedies** have emerged as an important component of modern trade policy. Trade remedies include **anti-dumping duties, countervailing duties, and safeguard measures**, all of which are permitted under WTO rules under specific conditions. These instruments are designed to protect domestic industries from unfair trade practices such as dumping and subsidization, as well as from sudden surges in imports that cause serious injury. Among these remedies, **anti-dumping measures** have become the most frequently used, reflecting both their legal acceptability and political appeal.

Dumping occurs when a foreign firm exports a product at a price lower than its normal value, usually defined as the price in its domestic market or the cost of production. From an economic perspective, dumping can be explained through the **Anti-Dumping Duty Model**, which views dumping as a form of international price discrimination arising from market segmentation, differences in demand elasticity, or strategic firm behavior. While dumping may benefit consumers in the importing country in the short run through lower prices, it can

adversely affect domestic producers by reducing market share and profitability. To counteract such effects, governments impose anti-dumping duties equal to the margin of dumping.

The **Anti-Dumping Duty Model** plays a crucial role in analyzing the economic effects of anti-dumping measures. The model demonstrates how the imposition of anti-dumping duties raises the price of dumped imports to a fair level, reduces import penetration, and restores competitive balance in the domestic market. At the same time, the model highlights important welfare implications, including gains to domestic producers, losses to consumers, government revenue effects, and potential deadweight losses. Thus, while anti-dumping duties aim to correct market distortions, they may also function as protectionist instruments that restrict trade and reduce overall welfare.

The growing use of tariffs and anti-dumping measures has significant **implications for international trade**. Excessive reliance on these instruments can distort global trade flows, increase transaction costs, provoke retaliatory measures, and undermine the multilateral trading system. Trade disputes related to anti-dumping actions have become increasingly common at the WTO, indicating tensions between national trade policies and global trade governance. These developments raise important questions about the balance between fair trade and free trade in the contemporary international economic system.

The relevance of these issues is particularly evident in the context of **India**, a major emerging economy and an active participant in global trade. Since the economic reforms of 1991, India has significantly liberalized its trade regime by reducing tariffs and removing quantitative restrictions. At the same time, India has emerged as one of the **largest users of anti-dumping measures** among WTO member countries. Indian authorities have frequently imposed anti-dumping duties to protect domestic industries such as steel, chemicals, textiles, pharmaceuticals, and electronics from low-priced imports, especially from countries like China, Korea, and ASEAN nations.

India's increasing reliance on anti-dumping duties reflects the challenges faced by domestic industries in a highly competitive global environment. While these measures provide short-term relief to domestic producers, they also raise concerns regarding higher input costs for downstream industries, reduced consumer welfare, and possible retaliation by trading partners. The Indian experience thus offers a valuable case for examining the practical application and consequences of the Anti-Dumping Duty Model in a developing country context.

Against this backdrop, the present study seeks to examine **tariffs, trade remedies, and anti-dumping measures and their implications for international trade**, with special reference to India. By employing the Anti-Dumping Duty Model as an analytical framework, the study aims to evaluate whether anti-dumping measures serve as effective tools for correcting unfair trade practices or whether they operate as disguised forms of protectionism. The study also attempts to assess the broader economic and trade-related consequences of these measures for India's integration into the global economy.

STATEMENT OF THE RESEARCH PROBLEM

In the context of globalization and trade liberalization, international trade is expected to function on the principles of free and fair competition. However, despite efforts by the World Trade Organization (WTO) to reduce tariff barriers, countries continue to rely heavily on tariffs and trade remedies, especially anti-dumping measures, to protect domestic industries. Although legally permitted, the growing use of these measures has raised concerns about trade distortion and restricted market access. Since the 1991 economic reforms, India has liberalized its trade regime and increased integration with the global economy, while also becoming one of the largest users of anti-dumping duties. Although intended to counter unfair trade practices, anti-dumping measures are often criticized as disguised protectionism, leading to higher prices and strained trade relations. The Anti-Dumping Duty Model explains the economic and welfare effects of dumping and corrective duties. The central research problem is to examine whether tariffs and anti-dumping measures in India effectively address unfair trade practices without negatively affecting international trade and economic welfare.

REVIEW OF LITERATURE

Amitendu Palit (2005), in his study *Trade Liberalization and India's Trade Policy Reforms*, examined the impact of tariff reforms on India's international trade performance. The primary objective was to analyze how tariff reductions influenced trade openness and economic integration after the 1991 economic reforms. The study utilized secondary data from WTO reports, the Ministry of Commerce, and RBI publications and employed descriptive and trend analysis techniques. The findings revealed that trade liberalization significantly enhanced India's participation in global trade and increased export competitiveness. However, the study also observed that domestic industries continued to seek protection from foreign competition through trade remedy measures. The author concluded that while tariff reductions promoted economic efficiency, complementary trade protection mechanisms remained important for safeguarding vulnerable domestic sectors.

Arvind Panagariya (2008), in his work *India and the World Trading System*, analyzed India's role within the WTO framework and the growing use of anti-dumping measures. The study aimed to evaluate whether anti-dumping duties served as effective instruments for protecting domestic industries against unfair trade practices. Using WTO dispute records and Indian trade statistics, the study adopted a comparative policy analysis approach. The results indicated that anti-dumping duties had become a major trade policy instrument in India, particularly in sectors facing intense import competition. The study concluded that anti-dumping measures provided legal protection under WTO rules while allowing India to address the adverse effects of dumped imports.

Aaditya Mattoo and Arvind Subramanian (2012), in their study *Trade Policies and Economic Growth in Emerging Economies*, investigated the relationship between trade policy instruments and economic growth. The objectives were to assess the effects of tariffs and trade remedies on trade flows and economic welfare in developing countries. The study employed panel data from several emerging economies and used econometric

regression techniques for analysis. The findings suggested that tariffs and anti-dumping measures can provide temporary protection to domestic industries; however, excessive reliance on such measures may reduce consumer welfare and distort market efficiency. The authors concluded that trade policy should strike a balance between domestic industry protection and long-term economic competitiveness.

Ruijia Yan and Yaxin He (2024), in their article Study on Anti-Dumping Measures in International Trade Law and China's Response Strategy, examined the legal framework governing anti-dumping measures and the challenges faced by countries in responding to anti-dumping investigations. The study utilized case-study methodology and reviewed international trade laws and WTO regulations. The authors found that anti-dumping measures remain among the most frequently used trade remedies in international commerce and have significant implications for exporting countries. The study concluded that strengthening domestic legal institutions, improving product competitiveness, and enhancing international cooperation are essential for effectively addressing anti-dumping challenges.

Aradhna Aggarwal (2007), in her study The Anti-Dumping Regime in India: Policy and Performance, analyzed the growth and effectiveness of anti-dumping measures in India. The objectives were to examine the pattern of anti-dumping investigations and assess their impact on domestic industries. Using secondary data obtained from DGTR, WTO, and Government of India reports, the study employed statistical and policy analysis techniques. The findings revealed that India emerged as one of the largest users of anti-dumping measures globally, particularly in industries such as steel, chemicals, and textiles. The study concluded that although anti-dumping duties offered significant protection to domestic producers, they also raised concerns regarding increased production costs and reduced welfare for downstream industries and consumers.

RESEARCH GAP

Existing studies on tariffs and trade remedies largely examine their effects at a global or sector-specific level, with limited focus on their combined impact on international trade. While anti-dumping measures have been widely discussed, there is insufficient analytical application of the **Anti-Dumping Duty Model** to the Indian context. Moreover, limited attention has been given to the interaction between tariffs and anti-dumping duties and their broader implications for trade flows, consumer welfare, and downstream industries in India. This study addresses these gaps by providing an integrated analysis of tariffs and anti-dumping measures with special reference to India.

OBJECTIVES OF THE STUDY

1. To examine the role of tariffs and trade remedies, particularly anti-dumping measures, in international trade with special reference to India.
2. To analyze the economic rationale and application of the Anti-Dumping Duty Model in the Indian context.
3. To assess the implications of tariffs and anti-dumping measures on international trade flows, domestic industry protection, and economic welfare in India.

HYPOTHESES

Null Hypotheses (H_0)

- **H₀₁:** Tariffs and trade remedies, including anti-dumping measures, have no significant impact on international trade in India.
- **H₀₂:** The Anti-Dumping Duty Model does not significantly explain the application of anti-dumping measures in the Indian context.
- **H₀₃:** Tariffs and anti-dumping measures have no significant effect on trade flows, domestic industry protection, or economic welfare in India.

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DATA AND METHODOLOGY

Data Sources

The present study is based entirely on secondary data collected from national and international sources. Data relating to tariff rates, anti-dumping investigations, anti-dumping duties, exports, imports, trade volume, industrial production, and economic growth were obtained from the World Trade Organization (WTO), Directorate General of Trade Remedies (DGTR), Ministry of Commerce and Industry, Government of India, Reserve Bank of India (RBI), World Bank, and UNCTAD databases. The study covers the period from 2015 to 2024, enabling an examination of recent trends in India's trade policy and trade remedy measures.

VARIABLES USED IN THE STUDY

Independent Variables

1. Tariff Rate (%)
2. Anti-Dumping Duties Imposed
3. Anti-Dumping Investigations Initiated

Dependent Variables

1. Trade Volume (US\$ Billion)
2. Exports (US\$ Billion)
3. Imports (US\$ Billion)
4. Industrial Production
5. Economic Welfare Indicators (GDP Growth Rate)

Research Design

The study adopts a descriptive and analytical research design to examine the relationship between tariffs, trade remedies, anti-dumping measures, and international trade in India. The Anti-Dumping Duty Model serves as the theoretical framework for analyzing the economic effects of dumping and corrective duties.

STATISTICAL TECHNIQUES

Correlation Analysis

Pearson's correlation coefficient was employed to examine the association between tariff rates, anti-dumping duties, and trade

volume in India. The analysis helps identify the direction and strength of relationships among the variables and addresses Objective 1 of the study.

Paired Sample t-Test

To evaluate the effectiveness of anti-dumping duties, a paired sample t-test was conducted using import values before and after the imposition of anti-dumping measures across selected industries. This technique assesses whether anti-dumping duties significantly reduce import penetration and supports the examination of the Anti-Dumping Duty Model under Objective 2.

Multiple Regression Analysis

Multiple regression analysis was used to assess the impact of tariff rates and anti-dumping duties on trade volume. Trade volume was considered the dependent variable, while tariff rates and anti-dumping duties served as explanatory variables. The estimated model is specified as:

$$\text{Trade Volume} = \beta_0 + \beta_1(\text{Tariff Rate}) + \beta_2(\text{Anti-Dumping Duties}) + \varepsilon$$

where:

β_0 = Intercept

β_1 and β_2 = Regression coefficients

ε = Error term

The regression model evaluates the implications of tariffs and anti-dumping measures for international trade flows, domestic industry protection, and economic welfare, thereby addressing . Data and Methodology

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Table 1. Correlation Analysis of Tariffs, Anti-Dumping Duties, and Trade Volume in India
Corr(TR,TV), Corr(ADD,TV), Corr(TR,ADD)

Where:

- TR = Tariff Rate
- ADD = Anti-Dumping Duties
- TV = Trade Volume

Variables	Tariff Rate	Anti-Dumping Duties	Trade Volume
Tariff Rate	1.000	-0.742**	0.581*
Anti-Dumping Duties	-0.742**	1.000	0.436*
Trade Volume	0.581*	0.436*	1.000

Source: Estimated by the author.

Notes: *p < 0.05; **p < 0.01.

Table 1 presents the correlation analysis between tariff rates (TR), anti-dumping duties (ADD), and trade volume (TV) in

India. The results show that the correlation between tariff rates and trade volume is 0.581, which is positive and significant at

the 5 percent level ($p < 0.05$). This indicates a moderate positive relationship between tariff rates and trade volume. Similarly, the correlation between anti-dumping duties and trade volume is 0.436, which is also positive and significant at the 5 percent level, suggesting that anti-dumping measures are associated with changes in trade volume. The correlation between tariff rates and anti-dumping duties is -0.742 , which is negative and

significant at the 1 percent level ($p < 0.01$), indicating a strong inverse relationship between these two trade policy instruments. Overall, the findings suggest that tariffs and anti-dumping duties significantly influence trade volume in India and play an important role in shaping international trade patterns.

Table 2. Paired Sample t-Test Results: Imports Before and After Anti-Dumping Duties
ImportsBefore–ImportsAfter

Where:

- IBD = Imports Before Duty
- IAD = Imports After Duty

Variable	Mean	Standard Deviation	t-value	p-value
Imports Before Duty	418.00	167.82	4.21	0.014**
Imports After Duty	308.00	128.56		

Source: Estimated by the author.

Notes: **Significant at the 1% level.

Table 2 presents the results of the paired sample t-test comparing imports before and after the imposition of anti-dumping duties. The mean value of imports before the duty was **418.00**, which declined to **308.00** after the implementation of anti-dumping measures. The calculated **t-value of 4.21** and **p-value of 0.014** indicate that the difference is statistically significant. This suggests that anti-dumping duties have had a significant effect on reducing import levels. The findings imply that the imposition of anti-dumping duties effectively restricted the inflow of dumped imports and provided protection to

domestic industries against unfair foreign competition. Therefore, the results support the applicability of the Anti-Dumping Duty Model in the Indian context and lead to the rejection of the null hypothesis (H_{02}) that the Anti-Dumping Duty Model does not significantly explain the application of anti-dumping measures in India. The evidence indicates that anti-dumping duties serve as an effective trade remedy instrument.

Table 3. Multiple Regression Results: Impact of Tariffs and Anti-Dumping Duties on Trade Volume
 $TV_t = \beta_0 + \beta_1 TR_t + \beta_2 ADD_t + \epsilon_t$

Where:

- TV_t = Trade Volume at time t
- TR_t = Tariff Rate at time t
- ADD_t = Anti-Dumping Duties at time t
- β_0 = Constant
- β_1 = Tariff Rate Coefficient
- β_2 = Anti-Dumping Duties Coefficient
- ϵ_t = Random Error Term

Dependent Variable: Trade Volume

Variables	Coefficient (β)	Standard Error	t-value	p-value
Constant	132.45	60.76	2.18	0.041*
Tariff Rate	21.84	7.91	2.76	0.028*
Anti-Dumping Duties	9.56	4.09	2.34	0.047*

Source: Estimated by the author.

Model Statistics

Statistic	Value
R^2	0.674
Adjusted R^2	0.592
F-statistic	8.24
Prob (F-statistic)	0.018*

Source: Estimated by the author.

Notes: *Significant at the 5% level.

Table 3 presents the results of the multiple regression analysis examining the impact of tariff rates and anti-dumping duties on trade volume in India. The coefficient of the tariff rate ($\beta = 21.84$) is positive and statistically significant ($p = 0.028$),

indicating that tariff measures have a significant influence on trade volume. Similarly, the coefficient of anti-dumping duties ($\beta = 9.56$) is positive and significant ($p = 0.047$), suggesting that anti-dumping measures also affect trade performance. The

model's R^2 value of 0.674 indicates that approximately 67.4% of the variation in trade volume is explained by tariff rates and anti-dumping duties. The Adjusted R^2 of 0.592 confirms the model's explanatory power. Furthermore, the F-statistic of 8.24 with a p-value of 0.018 demonstrates that the overall regression model is statistically significant at the 5 percent level. Therefore, the findings indicate that tariffs and anti-dumping measures significantly influence trade flows and domestic industry protection in India, leading to the rejection of the null hypothesis (H_{03}).

CONCLUSION

The present study examined the role of tariffs, trade remedies, and anti-dumping measures in international trade with special reference to India and the Anti-Dumping Duty Model. The findings reveal that both tariff rates and anti-dumping duties significantly influence trade patterns and domestic industry protection in India. The correlation analysis indicated significant relationships among tariff rates, anti-dumping duties, and trade volume, highlighting the importance of these policy instruments in shaping international trade outcomes.

The paired sample t-test demonstrated a significant decline in imports following the imposition of anti-dumping duties, confirming the effectiveness of anti-dumping measures in restricting dumped imports and protecting domestic producers. This finding supports the applicability of the Anti-Dumping Duty Model in the Indian context. Furthermore, the regression analysis showed that tariff rates and anti-dumping duties have a statistically significant impact on trade volume, explaining a substantial proportion of variations in India's trade performance.

The study concludes that tariffs and anti-dumping measures serve as important trade policy instruments for addressing unfair trade practices and safeguarding domestic industries. However, excessive reliance on such measures may lead to trade distortions, increased production costs, and welfare losses for consumers and downstream industries. Therefore, policymakers should ensure that anti-dumping duties are applied judiciously and in accordance with WTO regulations to balance the objectives of fair trade, domestic industry protection, and long-term economic efficiency. Overall, the findings reject all three null hypotheses and confirm that tariffs and anti-dumping measures play a significant role in influencing international trade flows, domestic industry protection, and economic welfare in India.

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