IJHSR
ijhighschoolresearch.org
RESEARCH ARTICLE

A Game-Theoretic Analysis of India-U.S. Tariffs Under the Trump Regime

Antara Shah

Greenwood High International School, No. 8-14, Gunjur Post, Varthur, Sarjapur, Bengaluru, Karnataka, India – 560087.; antarashah0@gmail.com
Mentor: Philip Liang

ABSTRACT: This paper investigates the evolution of India-U.S. trade relations in light of the Trump administration's reciprocal tariff strategy announced in 2025, along with the subsequently announced tariffs. Combining policy analysis with game theory modeling, the study traces a chronological narrative of tariff announcements, negotiations, and eventual de-escalation, with a focus on India's strategic response. Using a von Neumann–Morgenstern payoff matrix and incorporating trade volume data, sector-specific exposure, and geopolitical incentives, the paper constructs and normalizes payoffs to simulate rational choices by both states. It further evaluates the transition from unilateral threats to bilateral engagement, culminating in a 90-day tariff pause and the start of a phased trade agreement. The analysis reveals that India's choice of cooperation over retaliation yielded a higher long-term payoff, highlighting the value of game-theoretic reasoning in trade diplomacy.

KEYWORDS: Behavioral Economics, Game Theory, International Trade Policy, Tariff Negotiations.

Glossary

• **Bilateral Trade Agreement (BTA):** A formal arrangement between two countries to reduce trade barriers and facilitate economic exchange.

• **Chicken Game:** A strategic game where two players choose between escalation (defecting) or backing down (cooperating); mutual escalation leads to the worst outcome for both, capturing brinkmanship in negotiations.

• **Cooperation:** A strategy in game theory where a player chooses not to retaliate or escalate, often aiming for mutual benefit.

• **Defection:** Choosing a strategy that maximizes one's own short-term gain, even at risk to both parties (e.g., imposing high tariffs despite risk of retaliation).

• **Extensive-Form Game:** A way of representing games where players take turns making decisions, depicted as a tree showing each possible move.

• **Nash Equilibrium:** A set of strategies such that no player can benefit by changing their own strategy while the others keep theirs unchanged.

• **Normal-Form Game:** A game represented by a matrix, with players choosing strategies simultaneously and payoffs shown for every combination.

• **Ordinal Utility:** Ranking outcomes based on preference order rather than assigning numerical values.

• **Pareto-Inferior Outcome:** An equilibrium where at least one player could be made better off without making others worse off, compared to another possible outcome.

• **Payoff Matrix:** A table showing the outcomes (rewards/penalties) for all possible strategies chosen by players.

• **Prisoner's Dilemma:** A classic game illustrating why two rational individuals might not cooperate, even when it would benefit both.

• **Stackelberg Game:** A sequential game where one player (the leader) makes a move first, and the other player (the follower) responds, influencing final outcomes.

• **Subgame Perfect Nash Equilibrium (SPNE):** An equilibrium ensuring that strategies form a Nash equilibrium in every part (subgame) of the larger sequential game.

• **Trade Deficit:** A situation where a country imports more than it exports to a particular partner.

• **Utility Function:** A mathematical tool used to represent and compare the preferences of players for different outcomes.

Introduction

The United States and India share a longstanding trade relationship. As two of the world's largest democracies and fastest-growing economies, their bilateral trade has consistently expanded over the past decade. In 2024, India exported $87.5 billion worth of goods to the U.S., while the U.S. exported $41.9 billion in goods to India, a trade surplus of around $45 billion in India's favor. The U.S. is now India's largest trading partner, while India ranks 10th among U.S. trading counterparts, as shown in Table 1.

Table 1: Top 10 trading partners for India and the U.S. in 2024, ranked by total trade volume (exports and imports combined), illustrating each country's key bilateral trade relationships.

Largest trading partners for India			*Largest trading partners for U.S.*		
1.	U.S.	$119.7B	1.	Mexico	$839.9B
2.	China	$118.4B	2.	Canada	$762.1B
3.	United Arab Emirates	$83.7B	3.	China	$582.5B
4.	Russia	$65.4B	4.	Germany	$236.0B
5.	Saudi Arabia	$43.0B	5.	Japan	$227.9B
6.	Singapore	$35.6B	6.	South Korea	$197.1B
7.	Iraq	$33.3B	7.	Taiwan	$158.6B
8.	Indonesia	$29.4B	8.	Vietnam	$149.7B
9.	Hong Kong	$28.7B	9.	UK	$148.0B
10.	South Korea	$27.6B	10.	India	$129.2B

DOI: 10.36838/v8i1.41

Trump's Reciprocal Tariff Agenda:

On 2 April 2025, President Trump announced sweeping tariff increases which, if sustained, would amount to the most significant unilateral shift in American trade policy since the Smoot-Hawley Tariff Act of 1930.[1] The Trump administration signaled a hardline reciprocal tariff strategy to address what it viewed as unfair trade imbalances. Over 60 trading partners were hit with tariff increases exceeding 17% and the rest with a tariff hike of 10%.

Trump repeatedly lambasted India as a "tariff king" and "tariff abuser" for its high duties, arguing that U.S. goods faced far steeper barriers abroad than foreign goods did in America. He highlighted that the U.S. trade-weighted average tariff is only ~2–3%,2 versus about 12–17% for India on average, as shown in Figure 1,[3] and 52% for India on average, including peak rates and other non-tariff barriers.

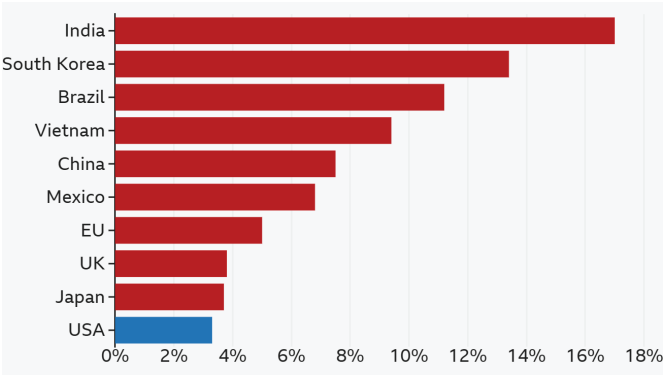

Figure 1: Average external tariff rates for major U.S. trading partners, highlighting India's higher trade barriers compared to the U.S.

India, unlike many countries that responded with retaliatory tariffs, opted for diplomatic engagement. It began negotiations toward a Bilateral Trade Agreement (BTA) aimed at mitigating the effects of the proposed 26% tariffs on Indian goods. These negotiations culminated in the first phase of a draft trade agreement in April 2025.[4]

Literature Review

Understanding the impact and rationale behind tariff strategies, especially the Trump administration's recent proposal of reciprocal tariffs and the negotiations following it, has prompted a rich body of academic literature in a short time period, as well as encouraged a look back at published literature in similar historical cases. Hence, much of this work begins by revisiting foundational principles of strategic trade theory, which outlines how governments attempt to shift the payoff structures of international trade in their favor by imposing targeted tariffs and non-tariff barriers.

McGwire[5] models Trump's tariff threats on China through extensive-form and normal-form games. His work demonstrates that while mutual tariff escalation is a Nash equilibrium, it is also Pareto-inferior to coordinated free trade. He also integrates utility theory with macroeconomic indicators such as GDP, framing trade policy through the lens of national welfare functions and utility payoffs.

Carvalho[6] applies classical and behavioral game theory to Trump's tariff policies, arguing that many of Trump's apparent bluffs were credible threats when analyzed as moves in a non-cooperative game. He frames these decisions using constructs such as the prisoner's dilemma and Stackelberg competition, where the U.S. acts as the first mover to set the game's tone, expecting compliance rather than retaliation from its trading partners. Through examples like Canada and Brazil withdrawing retaliatory threats, the paper concludes that Trump's strategy aimed less at protectionism and more at leverage maximization.

Specifically, from India's perspective, Atray and K.R.[7] explain the asymmetric exposure between India and the U.S., noting that while India exports heavily to the U.S. (18% of its total exports), the U.S. exports little to India (2.3%). This imbalance makes reciprocal tariffs disproportionately harmful for India. However, their paper also notes that India's growing domestic capacity and diversified trade partners may soften the blow of U.S. protectionism. The paper quantifies exposure by sector, highlighting vulnerabilities in pharma and textiles, while also stressing India's domestic market resilience.

A report by the State Bank of India Economics Research Department[8] offers one of the most comprehensive data-driven analyses of the U.S. reciprocal tariff proposal and its implications for India. The report not only tracks sector-wise exemptions and affected exports but also quantifies the likely impact on the trade deficit. It outlines how a tariff escalation from 10% to 26% would affect the balance of trade and explores realistic pathways for India to rebalance bilateral trade through increased U.S. crude oil purchases and defense imports. Importantly, the report anticipates that India could bring down the U.S. trade deficit from $45 billion to $25 billion through energy realignment alone, thereby mitigating the retaliatory tariff burden.

In synthesizing these sources, a clear theme emerges: Trump's tariff regime was neither entirely irrational nor purely nationalist. Instead, it operated under strategic models of coercive bargaining, brinkmanship, and asymmetric games, affirming that tariff negotiations can be mathematically modeled to predict both equilibrium outcomes and deviations caused by political or behavioral factors.

Despite these insights, a critical gap remains: few studies have formally modeled the U.S.–India tariff standoff as a strategic game. Existing analyses quantify impacts but often fail to account for the dynamic negotiation strategies between the U.S. and India, specifically, as well as the motivations of each country to pursue free trade or protectionism. This paper aims to address this specific angle and provide insights as to the game-theoretic motivations behind both the U.S. and India, as well as provide insights into the recent developments of the trade agreement between the pair.

The paper is guided by the following research question: How can the strategic interactions between India and the United States during the Trump administration's tariff regime be effectively modelled using game theory?

Methods

To model the U.S.–India trade negotiations succinctly, this paper applies the **von Neumann–Morgenstern game theory framework**, where players make decisions based on expected utilities. In this context, each country's utility is shaped by export volume, tariffs faced, economic consequences, and the geopolitical or strategic outcomes of its chosen actions.

- The policy choices are restricted to cooperation (negotiated tariffs) or retaliation (discounted reciprocal tariffs) for the U.S. and cooperation (accepting tariffs without retaliation) or retaliation (implementing tariffs) for India.
- The payoff matrix, representing the outcomes of their policy interaction, is predetermined and static in each conceivable strategic scenario.
- The U.S. and India possess full comprehension of the game theory matrix shown in Table 2.a., including its potential payoff matrix under that specific strategic scenario, where the outcomes for the U.S. are represented by a, b, c, and d, while the outcomes for India are denoted by A, B, C, and D.

Table 2.a.: Strategic interaction matrix representing U.S.–India tariff negotiation outcomes, showing payoff combinations under different cooperation and retaliation scenarios.

	India: No Retaliation	India: Retaliation
U.S.: Status quo/negotiated tariffs	(a, A)	(b, B)
U.S.: Reciprocal/discounted reciprocal tariffs	(c, C)	(d, D)

Payoff Structure:

Let:

- u = U.S. utility
- i = India's utility

Each utility function is calculated as:

$$U = (T_n \times V) + E_n + G_n \quad \text{... Equation 1}$$

Where:

- T_n: Tariff Rate
- V: Total trade volume
- E_n: Economic cost (subtracted in interpretation)
- G_n: Geopolitical/strategic score (0–10 scale)

A. Tariff Impact ($T_n \times V$):

T_n = Tariff Rate

1. U.S.: Cooperation - 10%, Defection - 26%
2. India: Cooperation - 0%, Defection - 5% or 10%

EXPLANATION

- During Trump's 2018–2019 trade actions, the U.S. imposed a 25% tariff on Indian steel and aluminium. Retaliating, India raised tariffs on steel by 15 percentage points as well as on almonds, walnuts, and apples, covering about 5.5% of U.S. exports to India compared to the U.S.'s tariffs on 14% of Indian exports. India thus applied partial retaliation on a targeted set of goods.[9]
- Additionally, research on trade retaliation strategies suggests that countries retaliate with tariff increases of half to two-thirds the magnitude of the levied tariffs.[10] Hence, I assume that on choosing defection, India would respond to a 10% U.S. tariff by imposing a 5% retaliatory tariff, and to a 26% U.S. tariff by imposing a 10% retaliatory tariff.

V = total trade volume

1. India Exports to U.S.: $87.5B
2. U.S. Exports to India: $41.9B

B. E_n = Economic Cost

Captures domestic economic costs associated with the imposition of tariffs, such as higher input costs and inflationary effects.

1. Negligible for India
2. For the U.S., imposing a 10% tariff is assumed to cause a 1% contraction in domestic growth, and a 26% tariff causes a 2.6% contraction.

EXPLANATION

Studies estimate that a percentage-point rise in the US effective tariff rate cuts growth by about 0.1%. So, I assume that a tariff base rate of 10% applied by the U.S. would slow the U.S. economy by as much as 1% on trade impact alone, while a tariff rate of 26% would slow economic growth by 2.6%.[11]

C. G_n = Geopolitical/strategic score

Table 2.b. displays the scoring for geopolitical or strategic score, called simply as 'qualitative impact' on both countries, based on the rationale given below. Qualitative impact scoring denotes the assignment of ordinal values on a fixed scale (0–10) to represent relative levels of impact. Scores are derived from structured judgement accounting for sectoral shifts, geopolitical gains or losses, and strategic benefits or costs, allowing consistent comparison across criteria alongside the other quantitative measurements.

1. India:-

Cooperation case:

a. Apple has unveiled its strategic initiative to relocate 25% of its iPhone manufacturing to India by 2025. It plans to move the entire US-bound iPhone assembly from China to India by 2026. The production of more than 60 million iPhones sold in the United States will be relocated to Indian factories as trade tensions with China persist.[12] Samsung is also evaluating a shift of some of its smartphone and electronics manufacturing from Vietnam to India, aiming to mitigate risks tied to potential US tariffs on Vietnamese exports.[13]

b. Cooperation signals diplomatic maturity, enhances India's global reputation, and strengthens U.S.–India strategic ties.

c. India is considering offering zero-duty imports from the U.S. in sectors like semiconductors and other areas covered by its Production-Linked Incentive (PLI) scheme. This move is intended to expedite a bilateral trade agreement with the U.S., potentially reversing reciprocal tariffs.[14]

DOI: 10.36838/v8i1.41

Retaliation case:

a. Retaliation risks targeted U.S. tariffs that historically hurt specific Indian sectors, which rely heavily on U.S. buyers. These include a fall in labor-intensive niche exports (handicrafts,[15] textiles,[16] dairy).[17]

b. Trade tension may trigger foreign investor nervousness and major market dips. The Indian stock market faced a 'Black Monday' with tariffs from US President Trump causing a significant downturn. BSE Sensex and NSE Nifty fell 3% each, erasing ₹14 lakh crore ($215.32 billion) in market capitalization, dropping to ₹389 lakh crore.[18] However, these effects are likely to be temporary, albeit more frequent if India chooses retaliation.

c. This decision could cause geopolitical instability and changes to broad strategic alignments between the countries (Ex, Quad, Indo-Pacific), though a mild retaliatory response is unlikely to alter core diplomatic relations.

2. U.S:-

Negligible for the U.S.

Table 2.b.: Weighted scoring of India's tariff response based on qualitative economic and geopolitical factors, assigning positive or negative scores and weights to reflect the relative importance of each outcome.

	Impact	Score (+1 / -1)	Weight	(Score × Weight)
India does not retaliate	Manufacturing opportunities	1	5	5
	Geopolitical stability	1	4	4
	PLI scheme concessions	1	5	5
India retaliates	Fall in labor-intensive exports	–1	2	–2
	Stock market disruption	–1	1	–1
	Geopolitical strain with U.S.	–1	1	–1

Next, the payoffs for India and the U.S. are calculated according to **Equation 1**, and shown in Table 2.c.

Table 2.c.: Calculated payoffs for the U.S. and India under different combinations of tariff actions and retaliatory responses, based on the underlying payoff formulas and trade data inputs.

U.S. Action	India Action	U.S. Payoff (u) Formula	India Payoff (i) Formula	(u, i)
Status Quo (10%)	**No Retaliation**	0.1 × 87.5 – 1 = 7.75	–0.1 × 87.5 + 0 + 5 + 4 + 5 = 5.25	**(a, A)** = (7.75, 5.25)
Status Quo (10%)	**Retaliation (5%)**	0.1 × 87.5 – 0.05 × 41.9 – 1 = 5.655	–0.1 × 87.5 + 0.05 × 41.9 – 1 – 1 – 1 = –10.655	**(b, B)** = (5.655, -10.655)
26% Tariff	**No Retaliation**	0.26 × 87.5 – 2.6 = 20.15	–0.26 × 87.5 + 0 + 5 + 4 + 5 = –8.75	**(c, C)** = (20.15, -8.75)
26% Tariff	**Retaliation (10%)**	0.26 × 87.5 – 0.1 × 41.9 – 2.6 = 11.46	–0.26 × 87.5 + 0.1 × 41.9 – 2 – 1 – 1 = –22.56	**(d, D)** = (11.46, -22.56)

Table 2.c illustrates the payoffs for both the U.S. and India under varying tariff and retaliatory strategies, quantifying the asymmetric consequences each scenario imposes on the two economies. Given these distributions, the rationale behind India's decision-making becomes clearer.

India's decision to respond to the U.S.'s 26% tariff with a lower 10% tariff reflects both asymmetric trade exposure and strategic restraint. Since 18% of India's exports go to the U.S., compared to only 2.3% of U.S. exports to India, a strictly reciprocal tariff would inflict disproportionate harm on India while having a limited impact on U.S. exporters. Thus, the 10% rate balances the need to signal resolve with the imperative to protect India's export-dependent sectors.

The initial phase of the analysis begins with a simultaneous strategic framework, reflecting moments where both countries set trade policies without strong leader–follower dynamics. However, the actual negotiations showed the United States acted first in announcing and imposing tariffs, establishing a leadership role with India responding as the follower. This real-world timing supports shifting to a Stackelberg sequential model, which better captures the strategic advantage of moving first and the corresponding optimal response of the second mover.

From a game-theoretic standpoint, a reduced retaliation functions as "soft" but credible signaling, consistent with Stackelberg competition models where the weaker player avoids escalation to preserve negotiation prospects.

Normalization of Payoffs:

To facilitate direct comparison across diverse measures, all raw values were normalized to a 0–5 ordinal scale according to **Equation 2**, and shown in Table 2.d.

This procedure allows for the preservation of relative rankings among categories, ensuring that patterns and strategic differences are discernible without dependence on underlying units or absolute magnitudes. It should be noted, however, that such normalization inherently abstracts away fine-grained distinctions; differences in magnitude between adjacent categories may not be uniform or proportionally represented.

$$\text{Normalized Score} = \frac{x - min}{max - min} \quad \text{... Equation 2}$$

Where:

- **x** is the computed payoff
- **max** is the highest observed payoff: **20.15**
- **min** is the lowest observed payoff: **-22.56**

Table 2.d.: Normalized payoff values for U.S.–India tariff strategies, derived using the min-max normalization formula to rescale raw payoffs onto a 0–1 scale for comparability across strategy combinations.

U.S. Action	India Action	u	i	Normalized US payoffs	Normalized India payoffs
Status Quo (10%)	**No Retaliation**	7.75	5.25	0.71	0.65
Status Quo (10%)	**Retaliation**	5.655	-10.655	0.66	0.28
26% Tariff	**No Retaliation**	20.15	-8.75	1	0.32
26% Tariff	**Retaliation**	11.46	-22.56	0.797	0

Payoffs are then **multiplied by 5** to map them onto a discrete ordinal scale **(0-10)** and rounded off (Table 2.e.)

Table 2.e.: Final game matrix of normalized, ordinal payoffs for U.S.–India tariff strategies, after mapping normalized scores onto a discrete 0–5 ordinal scale used for extensive-form modeling.

	India: No Retaliation	India: Retaliation
U.S.: Status Quo/negotiated tariffs	(4,3)	(3,2)
U.S.: 52/26% Tariff	(5,2)	(4,0)

Hence, we have obtained our payoff matrix for this strategic interaction. To better capture the sequential nature of decisions

in this negotiation, the interaction can also be represented as an **extensive form game**. (Figure 2)

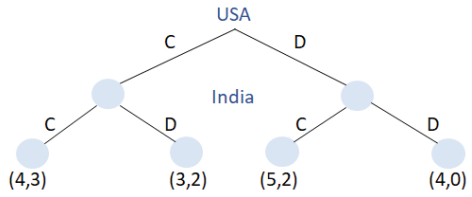

Figure 2: Extensive-form representation of U.S.–India tariff negotiations, illustrating the sequential structure of decisions where the U.S. acts first, followed by India's retaliation or cooperation choices.

Assumptions:

- For U.S. → C (cooperate) implies status quo or negotiated tariffs, D (defect) implies reciprocal or discounted reciprocal tariffs.
- For India → C implies no retaliation, D implies retaliation.

In this sequential game, the United States makes the first move: to either impose the full 26% reciprocal tariff or to apply the 10% baseline tariff under a negotiated pause. India then chooses whether to retaliate or to accept the tariff and cooperate by negotiating.

In this game, it is always rational for India to choose C in each subgame. For the U.S., defecting gives a higher payoff. So, the U.S. imposes discounted reciprocal tariffs with no retaliation from India. Therefore, the **subgame-perfect Nash Equilibrium (SPNE)** is initially - India: 10% tariff, U.S.: 26% tariff (5,2). However, factoring in India's agreement to negotiate a trade deal and its slashed tariffs on certain goods, the U.S. now chooses to cooperate instead, soon after defecting, now resulting in an SPNE of (4,3) – mutual cooperation – as discussed further in the next section.

The SPNE, as well as the Nash equilibrium in this analysis, is driven solely by the ordinal ranking of utility values. Only the order of preferences matters, not their absolute magnitudes. Among the three components of utility considered, it is asymmetric trade exposure that plays the decisive role in determining the equilibrium outcome. This result highlights the importance of our assumption regarding sensitivity to specific sector losses, which fundamentally shapes the strategic choices observed.

The equilibrium strategies are derived using **backward induction**, a standard game-theoretic technique for solving sequential or extensive-form games. This method begins at the final stage of the game, determining the optimal action for the player moving at that point, and then works backward through each preceding stage to identify earlier optimal actions. At each step, the selected choice is the best response given anticipated future play, resulting in a subgame perfect equilibrium under the assumptions of rationality and perfect information.

Note: All numericals used are of my own method, so no sources are applicable.

Limitations:

While presenting strategies and outcomes in a static payoff matrix can clarify the analysis, it is important to recognize several limitations inherent in this approach, especially given the qualitative nature of some inputs. These considerations inform how results should be interpreted and the degree of confidence placed in specific findings:

- **Unchanging assumptions:** The static matrix models incentive structures as fixed, even though real negotiations may involve shifts in priorities, external influences, or evolving responses from each side.
- **Limits of qualitative scoring:** Assigning impact scores using categories or rankings is influenced by subjective judgment or group consensus, which might not capture small but significant differences between outcomes.
- **Testing robustness:** Sensitivity checks help gauge how results might change if assumptions, scoring methods, or categories are adjusted. Nevertheless, using broad qualitative categories can sometimes overlook context-specific effects.
- **Cautious interpretation:** The results are better understood as illustrative of major strategic patterns rather than precise, definitive forecasts of behavior.

Result and Discussion

Game-Theoretic Analysis of the sequence of moves:

In game-theoretic terms, Trump's opening move was akin to a leader setting the rules of a game. In a **Stackelberg game**, one player—the *leader*—moves first, setting the terms of engagement, while the *follower* reacts based on this initial move. This structure captures power asymmetries in strategic settings, where the leader's early action influences the follower's optimal response. Thus, the U.S., acting as the leader, moved first with a credible threat of tariffs, expecting India to respond by lowering its own barriers. This proposal essentially framed the confrontation as a kind of matching strategy: if India was charging on average 52% on certain U.S. goods, the U.S. would reciprocally charge the same. The White House even declared a national emergency under the International Emergency Economic Powers Act to enable these tariffs, emphasizing America's large trade deficits and the "golden rule" of reciprocity.

Both U.S and India faced a classic strategic dilemma: the United States could follow through on tariff threats (defect in a cooperation sense) or further negotiate (cooperate), and India could either retaliate with its own tariffs or concede by reducing its trade barriers.

From the game in Table 2.e, we infer that the U.S. benefits the most from reciprocal or discounted tariffs if India chooses not to retaliate. Hence, Trump unveiled the "reciprocal tariffs" – tariffs aimed at mirroring the high duties countries like India impose on American goods – in February. This framing signaled a *tit-for-tat strategy*: since India charges 52% on average on U.S. exports, the U.S. would reciprocate. Trump highlighted specific disparities to justify this move – for example, the U.S. charges only 2.5% on imported cars while India charges 70%, or U.S. apples enter India at 50% duty, whereas Indian apples face zero U.S. duty.[19]

DOI: 10.36838/v8i1.41

These tariffs were a markup of the US's merchandise trade deficit with a given country. The Trump administration indicated that trade deficits are due to a variety of tariff and non-tariff factors. Non-tariff factors believed to be responsible for trade deficits include regulatory barriers to American products, environmental reviews, differences in consumption tax rates, compliance hurdles and costs, currency manipulation, and undervaluation.[20] India's merchandise exports and imports to the US in 2024 were $87.5 billion and $41.9 billion, respectively. This left a trade deficit of $45.6 billion, 52% of India's exports to the U.S, and hence, 52% was the expected tariff rate.

However, when the tariffs were implemented on 2nd April, they came at a rate of 26% instead of 52%. This discounted rate, including currency manipulation and trade barriers, tells us that the proposal was more of a negotiation strategy. To understand each player's incentives, we can outline their utility functions as follows.

The U.S.'s strategic objective in imposing tariffs was to pressure India into reducing trade barriers or making policy concessions. From a utility perspective, the U.S. benefits from increased export revenue and improvements in the trade balance—such as a reduced bilateral trade deficit and greater domestic employment—while incurring costs in the form of higher consumer prices and potential geopolitical backlash. Hence, U.S. utility increases with stronger export performance and favorable trade terms, and decreases with rising domestic costs or diplomatic fallout.

India's utility increases with continued export access to the huge U.S. market, and decreases with the economic hit from U.S. tariffs. It also decreases with any political cost domestically if it is seen as "giving in" too much.

India had benefited from a trade surplus of over $45 billion with the U.S. in 2024, and American demand was crucial for sectors like engineering goods, electronics, gems, and pharmaceuticals (Figure 3.a.).[21] Thus, India sought to maintain the status quo of its trade flows.

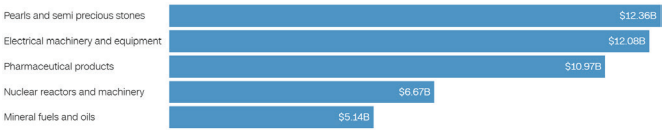

Figure 3.a.: Major U.S. imports from India in 2023, including fuels, jewelry, and machinery, were affected by tariff policies.

Meanwhile, U.S. exporters had been trying to break into India's market for products such as agriculture and motorcycles, often frustrated by India's high tariffs. India's top imports from the U.S. include crude oil, precious stones, nuclear technology, and machinery (Figure 3.b.) — sectors that stood to gain if India lowered its barriers.

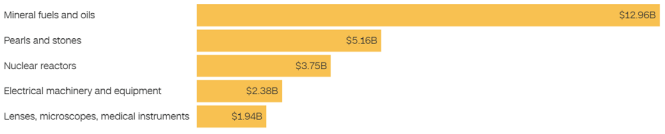

Figure 3.b.: Major Indian imports from the U.S. in 2023, including defense, reactors, and technology sectors, were affected by tariff policies.

Both countries thus entered this game with opposing objectives: the U.S. aimed to maximize leverage to force market opening, and India aimed to maintain the status quo of advantageous access while minimizing concessions.

Tariff Implementation and India's Calculated Restraint:

The discounted reciprocal tariff rate was severe enough to hurt Indian exporters, but also explicitly reversible if India came to the table with concessions. Game-theoretically, the U.S. had now defected in the one-shot sense (by breaking from free trade cooperation), testing India's response. New Delhi pointedly did not announce any counter-tariffs against U.S. goods. It prepared concession offers: India indicated it was open to cutting tariffs on 55% of U.S. imports (worth $23 billion) in a phased trade deal (Reuters, 2025).[22] This was a substantial offer – India's biggest tariff cut in years – aimed at securing a reversal or exemption from the 26% tariffs while protecting its sensitive sectors.

From the perspective of a **Chicken Game**, a classic game theory model where two players risk mutual destruction unless one yields, the U.S. and India were locked in a high-stakes standoff and hurtling toward a collision on April 2. The U.S. stayed on course while India swerved slightly by not retaliating. India's decision can be seen as an attempt to avoid the worst-case payoff (a full trade war) by yielding in the short term, even though it meant taking a tangible economic hit.

The transition from the Stackelberg model to the Chicken Game reflects a change in negotiation dynamics as public threats of escalation increased. While the Stackelberg framework suits the initial leader–follower setting, continued bargaining erased clear asymmetry, with both countries willing to risk costly outcomes to gain leverage. This escalation and the risk of mutual harm made the Chicken Game a more accurate representation, capturing strategic brinkmanship where neither side wishes to "swerve," yet both wish to avoid the worst-case scenario of a tariff war.

Indian financial markets tumbled on the news of the 26% tariff – the Mumbai Sensex index fell over 1.5% in a day, wiping out billions in investor wealth. The Reserve Bank of India cut interest rates and revised growth forecasts downward, citing "trade frictions" as a risk to the economy.[23] Indian exporters in sectors like electronics, auto parts, and textiles braced for reduced competitiveness in their largest market. Even the mere threat of sustained tariffs caused some U.S. importers to start re-evaluating supply contracts – for instance, Indian shrimp exporters (India is the largest supplier of shrimp to the U.S.) warned that a 26% duty could destroy demand for their ~$7 billion industry, as buyers would shift to countries with lower tariffs.[24] In short, India was feeling real pain, which increased the credibility of its promise to negotiate seriously.

Still, India's constraints included domestic political pushback – India retained high duties on dairy and agriculture to protect farmers, and on tech to nurture local industry. Any concession in these areas risked domestic censure. Also, Modi's administration had already shown flexibility by lowering tariffs on items like high-end motorcycles and bourbon whiskey,[25] and by scrapping a digital services tax that hit U.S. tech firms.[26]

In international negotiations, actions like delaying retaliation or agreeing to preliminary talks can serve as **confidence-building signals**, used to de-escalate tensions and signal cooperative intent before formal outcomes are decided. So, these moves made by India in the lead-up to talks were confidence-building signals to Washington.

Reduction of the U.S. tariff rate on India to 10%:

On April 9, 2025, President Trump announced a 90-day pause on the country-specific tariffs for all U.S. trading partners except China, effectively reducing India's tariff rate to the baseline 10% that was placed on all countries.[27] This was true to the SPNE – within just a day of imposing the 26% tariffs on India, Trump implemented the negotiated tariff rate at 10%.

This occurred after intense volatility in financial markets and diplomatic outcry. Trump insisted this pause was a reward: "all countries that had not retaliated against US tariffs would receive a reprieve – and only face a blanket 10% tariff until July". Since India had not retaliated, it qualified for this relief. The decision to reduce India's tariffs to 10% (and pause further escalation) was made by the U.S. unilaterally, but it was clearly in reaction to India's and others' choices.

Indian exporters got a reprieve: sectors like shrimp, which were at a tariff disadvantage, suddenly regained parity, and the threat to industries like diamonds and pharmaceuticals was postponed. India's payoff moved from a very low value under 26% tariffs toward a more moderate outcome, although it still faces a 10% duty. The U.S. payoff in this move was mixed: Economically, it avoided compounding inflation and supply shocks – the 10% universal tariff still had some effect on prices, but it was far less disruptive than the high surcharges on major partners, yet it would have gained more by a higher tariff rate imposition.

India used the 90-day window to accelerate alliance-building in a diplomatic sense. The India-U.S. bilateral trade agreement (BTA) was discussed, part of "Mission 500", aiming to more than double total two-way trade to $500 billion by 2030.[28] The deal is expected to cover a wide range of sectors, including energy, critical minerals, technology, and manufacturing, with India open to considering zero-duty imports from the US in select industries under its Production-Linked Incentive (PLI) schemes. By April 23, an Indian delegation was in Washington to kick off negotiations for a broader trade pact.

Once both nations signaled an intent to shift from confrontation to negotiation, the strategic problem changed from brinkmanship to cooperative coordination. After public threats subsided and reciprocal concessions were offered, both sides faced the challenge of aligning on mutually beneficial agreements. This shift is best described by a **Coordination Game**, which emphasizes the importance of selecting compatible strategies to maximize shared gains and avoid inefficiencies born of misalignment.

Outcome and Equilibrium Considerations:

By the end of the 90 days, one of a few outcomes will emerge:

(a) A partial trade deal is reached – likely the first phase of an agreement, reducing or eliminating the U.S.'s reciprocal tariffs permanently in exchange for specific Indian concessions. This outcome would be a win-win equilibrium relative to war: both avoid the worst tariffs and can claim victory (Trump gets some tariff reductions from India; Modi avoids 26% tariffs and gains a larger export market).

(b) Extended pause – if close to a deal, they might extend the negotiating period, effectively continuing the game a bit longer.

(c) Return to Tariff Conflict – if talks broke down, the game would revert to the harsher equilibrium: U.S. reinstates 26% (or even higher) tariffs, and India almost certainly retaliates now, having exhausted diplomatic avenues.

However, given the flurry of activity between the two countries and their delegations during the 90-day pause, and considering that since March, India and the US have been working toward a phased trade agreement, aiming to wrap up the first phase by September-October and with the broader ambition to more than double bilateral trade from the current $191 Billion to $500 billion by 2030, it is clear both prefer outcome (a) or at least (b) to avoid c).

In game theory terms, the players were attempting to transition from a non-cooperative equilibrium to a cooperative equilibrium via a negotiated agreement, effectively changing the rules of the game (from unilateral actions to a bilateral contract).

■ Conclusion

Through a comprehensive game-theoretic exploration, this paper demonstrates how the India-U.S. tariff standoff evolved from brinkmanship to tentative cooperation. The Trump administration's proposal of reciprocal tariffs introduced an abrupt shift in American trade policy, with India caught in a uniquely vulnerable yet strategically flexible position. Modeling the situation through strategic games—Prisoner's Dilemma, Chicken, and Stackelberg frameworks—enabled a clearer understanding of how utility, retaliation asymmetries, and sectoral dependence shaped decision-making on both sides.

India's restraint and willingness to negotiate, even under pressure, allowed it to mitigate economic damage while preserving long-term trade interests. The 90-day tariff reprieve and the fast-tracked bilateral negotiations signal a mutual desire to shift from non-cooperative equilibria toward a rules-based framework governed by formal agreement rather than retaliatory calculus.

These findings have broader implications for future trade negotiations under varying political regimes. By modeling the strategic choices and consequences of tariff actions and retaliations, this analysis highlights how changes in leadership style, domestic priorities, or diplomatic approaches can alter the structure and outcomes of bilateral negotiations. For instance, a more cooperative or multilateral regime may favor strategies resembling coordination games, emphasizing mutual gains and stable agreements. In contrast, more confrontational or protectionist governments could drive negotiations toward brinkmanship, escalation, and greater uncertainty, matching dynamics seen in Chicken or Stackelberg models. Recognizing these patterns allows policymakers to anticipate likely negoti-

DOI: 10.36838/v8i1.41

ation outcomes and adjust their approaches depending on the anticipated style and incentives of future administrations.

While the literature has explored tariff politics broadly, this paper fills a critical gap by providing a structured, quantitative, and country-specific model of strategic interaction. In doing so, it highlights not just the dynamics of retaliation and cooperation but also how economic diplomacy can be guided by mathematical insights, offering a model for other nations navigating similar asymmetries in global trade.

Acknowledgments

I'd like to sincerely thank Philip Liang for his invaluable mentorship and guidance throughout the research and writing process. I'm also extremely grateful to Dr. Sunitha Jadhav, Dr. Anand Shrivastava, and Dr. Ajay Massand for reviewing my paper and providing thoughtful suggestions. Finally, I thank my parents for their constant encouragement and unwavering support throughout my writing journey.

References

1. CSIS Economics Program. Liberation Day: Tariffs Explained. Center for Strategic and International Studies, April 2025. https://www.csis.org/analysis/liberation-day-tariffs-explained
2. The White House. Fact Sheet: President Donald J. Trump Declares National Emergency to Increase Our Competitive Edge, Protect Our Sovereignty, and Strengthen Our National and Economic Security. The White House, April 2025. https://www.whitehouse.gov/fact-sheets/2025/04/fact-sheet-president-donald-j-trump-declares-national-emergency-to-increase-our-competitive-edge-protect-our-sovereignty-and-strengthen-our-national-and-economic-security/
3. BBC. India Braces for U.S. Tariff Escalation. BBC News, April 2025. https://www.bbc.com/news/articles/cjw4epl1994o
4. The Hindu. India–U.S. Trade Talks from April 23 in Washington to Give Impetus to BTA Negotiations. The Hindu, April 2025. https://www.thehindu.com/news/national/india-us-trade-talks-from-april-23-in-washington-to-give-impetus-to-bta-negotiations/article69482422.ece
5. McGwire, J. A Game Theory Analysis of Donald Trump's Proposed Tariff on Chinese Exports. Student Econ. Rev. 2017, 31, Trinity College Dublin. https://www.tcd.ie/Economics/assets/pdf/SER/2017/9trump.pdf
6. Carvalho, C. Trump and Game Theory: Tariffs as a Geopolitical Strategy. SSRN 2025. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5180046
7. Atray, R.; Ramya, K. R. Checkmate or Stalemate: India's Trade and Output Losses under U.S. Reciprocal Tariffs. SSRN 2025. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5155287
8. State Bank of India (SBI). US Economy Heading Towards (Un) exceptionalism? SBI Research, 2025, Issue 32. https://sbi.co.in/documents/13958/43951007/US+Economy_SBI+Report.pdf
9. Bown, C. P. Trump's Mini-Trade War with India. Peterson Inst. Int. Econ., 2019. https://www.piie.com/blogs/trade-investment-policy-watch/trumps-mini-trade-war-india
10. Bagwell, K.; Staiger, R. W. An Economic Theory of GATT. Am. Econ. Rev. 1999, 89(1), 215–248.
11. India Today. Trump's Tariffs Could Hit U.S. Growth. India Today, April 17, 2025. https://www.indiatoday.in/business/story/ruchir-sharma-on-trump-tariffs-global-and-indian-economy-impact-stock-markets-interview-2710697-2025-04-17
12. Reuters. Apple Aims to Source All U.S. iPhones in India. Reuters, April 25, 2025. https://www.reuters.com/world/china/apple-aims-source-all-us-iphones-india-pivot-away-china-ft-reports-2025-04-25/
13. Economic Times. Samsung Seeks Extension of PLI Sops. Econ. Times, 2025. https://m.economictimes.com/industry/cons-products/electronics/samsung-seeks-one-more-year-of-pli-sops-in-lieu-of-fy22/articleshow/120560034.cms
14. The Times of India. India Fast-Tracks Trade Deal with U.S. Times of India, 2025. https://timesofindia.indiatimes.com/business/india-business/india-looks-to-fast-track-trade-deal-with-us-open-to-duty-on-imports-from-us-in-pli-others-sectors/articleshow/120121625.cms
15. Deccan Herald. Handicraft Exports Hit by U.S. Tariff Uncertainty. Deccan Herald, 2025. https://www.deccanherald.com/india/handicraft-exports-hit-by-us-tariff-uncertainty-2-3527820#
16. Economic Times. Trump's Tariffs Threaten India's Textile Sector. Econ. Times, 2025. https://economictimes.indiatimes.com/small-biz/sme-sector/fabric-of-the-industry-frays-what-trumps-tariffs-really-mean-for-indias-textile-sector/
17. Economic Times. India's Dairy Exports Threatened by Trump's Tariffs. Econ. Times, 2025. https://economictimes.indiatimes.com/small-biz/trade/exports/insights/trumps-tariffs-threaten-indias-niche-dairy-exports-heres-how-to-fight-back/
18. Mint. Trump's Tariffs Erase Rs. 19 Lakh Crore from Markets. Mint, April 2025. https://www.livemint.com/market/stock-market-news/rs-19-lakh-crore-wiped-off-from-indian-stock-market-as-trump-tariffs-unleash-economic-nuclear-war-11744000366679.html
19. The Times of India. India Charges 52%, Trump Imposes Discounted 26% Tariff. Times of India, 2025. https://timesofindia.indiatimes.com/world/us/india-charges-52-but-trump-imposed-a-discounted-26-tariff-heres-why/articleshow/119938146.cms
20. USTR. Reciprocal Tariff Calculations. Office of the United States Trade Representative, 2025. https://ustr.gov/sites/default/files/files/Issue_Areas/Presidential%20Tariff%20Action/Reciprocal%20Tariff%20Calculations.pdf
21. CNN. India-U.S. Trade Explainer. CNN Business, February 2025. https://edition.cnn.com/2025/02/11/business/india-us-trade-explainer-intl-hnk-dg
22. Reuters. India Unlikely to Retaliate Against Trump's Tariffs. Reuters, April 6, 2025. https://www.reuters.com/world/india/india-unlikely-retaliate-against-trumps-tariffs-deal-talks-progress-sources-say-2025-04-06
23. Economic Times. RBI Cuts Interest Rates Amid Trade Tensions. Econ. Times, April 9, 2025. https://m.economictimes.com/news/newsblogs/rbi-mpc-meet-live-updates-monetary-policy-meeting-fy-2025-26-repo-rate-change-gdp-cpi-inflation-highlights-09-april-2025/liveblog/120110026.cms
24. Reuters. Indian Shrimp Industry Impacted by Trump Tariffs. Reuters, April 14, 2025. https://www.reuters.com/world/india/indian-shrimp-industry-sails-troubled-waters-after-trump-tariffs-2025-04-14
25. Reuters. India Files for Harley-Davidson and Bourbon Concessions. Reuters, February 19, 2025. https://www.reuters.com/world/india/india-file-harleys-bourbon-modis-offerings-trump-2025-02-19/
26. Reuters. India Proposes Removing Equalisation Levy on Digital Services. Reuters, March 25, 2025. https://www.reuters.com/world/india/india-proposes-remove-equalisation-levy-digital-services-government-source-says-2025-03-25/
27. The White House. Trump Secures Historic Trade Win. The White House, May 2025. https://www.whitehouse.gov/fact-sheets/2025/05/fact-sheet-president-donald-j-trump-secures-a-historic-trade-win-for-the-united-states/

28. Economic Times. India-U.S. Aim to Double Trade to $500 Billion. Econ. Times, 2025. https://cfo.economictimes.indiatimes.com/news/india-us-aim-to-double-bilateral-trade-to-usd-500-bn-by-2030-announces-plan-for-mega-trade-deal/118249983

Author

Antara Shah is a high school senior at Greenwood High International School, Bengaluru, India. Her academic and research interests include economics, finance, and policy. She plans to pursue economics and related fields at the undergraduate level.

DOI: 10.36838/v8i1.41