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A Game-Theory Analysis of Political Decision-Making in Geopolitical Hotspots: Perspective on Crisis Management in Border Disputes

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ABSTRACT

This This review analyses the application of game theory and behavioural economics to political decision-making in geopolitical hotspots, with a focus on border disputes. Using case studies, it highlights how strategic interactions and psychological factors like loss aversion influence crisis management. The paper aims to provide insights for mitigating tensions and improving conflict resolution strategies

Keywords: Game theory, Behavioural economics, Border disputes, Crisis management, Political decision-making

Introduction

Game theory is a mathematical framework that studies strategic interactions where the outcome for each participant depends on the actions of all the parties involved in the decision-making.

Game theory provides valuable insights on how states navigate complex national-threatening issues involving competition, cooperation, and conflict. The significance in game theory lies in its ability to model situations where the decision of one party involved is dependent on the choices of the others involved, making it significantly more relevant, if not important, in international relations.

Behavioural economics incorporates insights from psychology into economic models, challenging the assumption that individuals always act rationally. It sheds light on the complexities of human behaviour in different environments, especially high-stake ones. like political decision-making. It emphasises the influence of emotion, bias, and cognitive limitations in decision-making.

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The key concepts in behavioural economics include prospect theory, loss aversion, and framing effect.

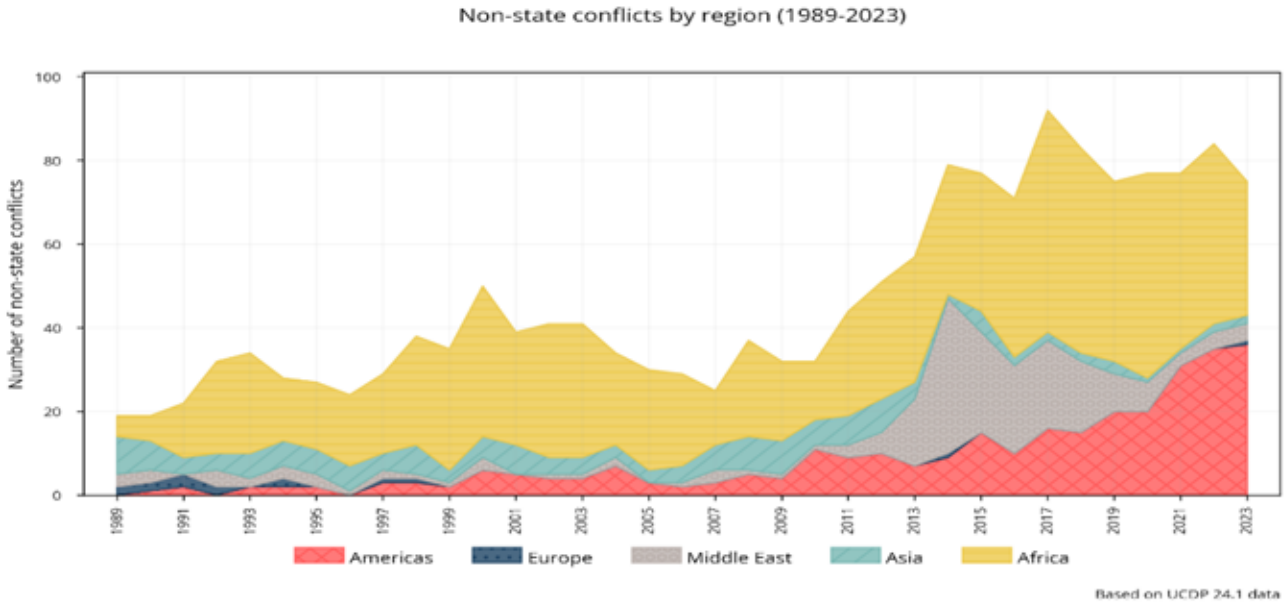
Relevance to Border Conflicts

Border conflicts are a prevalent issue in international relations, and they have been on the rise in recent years due to multiple reasons, from resource competition to territorial disputes. Game theory and behavioural economics offer valuable insights to analyse such disputes. The strategic calculations involved in border disputes were preceded by careful planning of the opposing actions and reactions of the public.

Game theory is often useful in such contexts as it models decisions made by the states in response to the threat or opportunity. For instance, during a border crisis, the state may choose between escalation or negotiation, bearing in mind the potential risks and rewards.

Behavioural economics addresses the psychological factors that influence decision-making. Leaders may be motivated by emotions like anger or fear, leading to overreactions or miscalculations. Furthermore, understanding concepts like loss aversion can explain why states may adopt aggressive methods of retaliation when negotiation may be more beneficial in the long run.

Conflict Data Graphs



Source: https://ucdp.uu.se/

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Statistics on border conflicts underscore the significance of this analysis. According to the Uppsala Conflict Data Program, there were 400 significant border conflicts worldwide between 1990 and 2020, leading to substantial human and economic costs. By applying game theory and behavioural economics, researchers, policymakers, and leaders can learn insights that would mitigate future crises.

Theoretical Framework: Classical Game Theory Concepts

Prisoner's Dilemma: Cooperative v/s Non-Cooperative outcomes

The prisoner's Dilemma is a fundamental model in game theory that illustrates the tension between individual rationality and benefit. It involves two players who must decide independently whether they want to cooperate or defect. If both cooperate, they receive a moderate benefit; if both defect, they suffer a significant loss. However, if one cooperates while the other defects, the defector receives a higher payoff while the cooperator suffers a significant loss.

In the context of border conflicts, the prisoner's dilemma can represent situations where two states must decide whether to maintain peace or escalate tensions. While mutual cooperation leads to stability, mutual defection can lead to prolonged conflicts causing major harm to all parties involved. However, the fear that the opponent may defect often prevents the parties from ever cooperating, even if it is for their benefit in the long run.

A commonly known example of this is the India-Pakistan conflict, where both states often face the dilemma of whether to engage in peaceful dialogues or resort to military posturing. The frequent lack of trust and fear can lead to suboptimal outcomes for both parties, seeing there is a recurring conflict over the Kashmir region. Understanding prisoners' dilemmas helps policymakers get better strategies for better cooperation.

Chicken Game: Decision under high-stakes scenarios

The chicken game is another model that illustrates situations where two players head towards mutual destruction unless one yields. The optimal strategy is for one player to back down, but if neither do, the result is catastrophic. The game is relevant to high-stakes international conflicts where states engage in the conflict, each hoping the other will step down first.

In border disputes, the chicken game can be seen in scenarios like military standoffs or nuclear standoffs, where the cost of escalation is summountable. A notable example is the Cuban missile crisis, where the United States and the previously existing Soviet Union engaged in a game of

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brinkmanship. Both sides placed immense pressure on each other, risking a nuclear war unless one party backed down.

Understanding the dynamics helps recognise the importance of signalling in negotiations. Leaders must communicate their resolve clearly but also leave room for de-escalation to avoid disastrous outcomes without appearing weak.

Repeated Games

Repeated games extend the analysis of one-shot games like Prisoners Dilemma by considering the implications of the ongoing interaction. In Iterated Prisoner's Dilemma, the game is played multiple times, allowing the player to develop a strategy based on the opponent's past behaviour. Cooperation early on is mutually beneficial for both parties.

In border conflicts, repeated interactions can lead to a tit-for-tat strategy where the state follows the opponent's previous action. For instance, if a state responds to a border invasion with a similar response, it sends in signals that it is willing to retaliate but prefers peaceful methods. In the long run, this would establish the norm and reduce the likelihood of the situation escalating.

The iterated prisoner's dilemma also highlights the importance of reputation. A state well known for not defecting on agreements is more likely to be trusted for future negotiations compared to a state that is not as cooperative.

Theoretical Framework: Behavioural Economics

Prospect Theory and Risk Perception

Prospect theory, developed by Daniel Kahneman and Amos Tversky, challenges the classical economic assumption of rational actors. It suggests that people evaluate outcomes based on perceived gains and losses rather than final outcomes. Losses are often weighted more heavily than equivalent gains, leading to risk-averse or risk-seeking behaviours depending on the context.

In the context of border disputes, prospect theory can explain why states sometimes pursue seemingly irrational strategies. For example, a state that perceives a territorial concession as a loss may take aggressive actions to avoid it, even if the overall cost of conflict outweighs the benefits. This behaviour is evident in conflicts where states refuse to cede disputed territory, viewing any compromise as an unacceptable loss rather than a potential gain in peace and stability.

Emotional influences on strategic decisions

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While classical game theory assumes rationality, real-world decisions are often influenced by emotion. Fear, anger, humiliation, and others drive the state to behave in ways that deviate from mathematically calculated strategic decisions. For example, fear may lead to pre-emptive strikes, while anger can lead to retaliatory actions that escalate conflicts.

In border disputes, emotional factors can be extremely influential. Leaders may be pressured to act strategically and maintain the national image. For example, the Kargil War between India and Pakistan in 1999 was influenced not only by strategic considerations but also by nations pride and desire to avenge past conflicts' humiliation.

CASE STUDY 1: Teesta Water Conflict

Background and Context

The Teesta River conflict between India and Bangladesh, primarily centred around water-sharing agreements, is an example of the Prisoner's Dilemma. Both nations could benefit from cooperation, but political pressures and loss aversion have led to non-cooperative outcomes. (The following data is used as an example and are not actual values.)

Construction of Payoff Matrix: (Table: 1)

India's strategies	Bangladesh's Strategies
Share 40% of the water flow during dry seasons.	Use 50% of available water during dry seasons.
Share 60% of the water flow during dry seasons.	Use water from the Dalia Project.
Do nothing; let the river flow freely.	Do nothing; accept the loss of resources.

The payoff matrix summarises the potential outcomes for each combination of strategies chosen by India and Bangladesh. The payoffs are hypothetical values representing the economic benefits or losses each country might experience based on their decision.

Table 1: Payoff Matrix for the Teesta Water Conflict

		Bangladesh		
		50% Use	Dalia Project	Do Nothing
India	40% Share	(1, 2)	(1, 1)	(0, -2)
	60% Share	(2, 3)	(2, 2)	(1, -3)
	Natural Flow	(-1, -1)	(0, -2)	(-2, -4)

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Analysis of Strategies

India Shares 40% of the Water	India Shares 60% of the Water	Let the River Flow Naturally
If Bangladesh opts to utilise 50% of the water, both countries benefit positively, represented by the payoff (1, 2). Here, India experiences slight gains, whereas Bangladesh benefits from significantly higher gains, accessing a larger share of water.	If Bangladesh uses 50% of the water, this scenario yields a higher payoff for India and a relatively higher payoff for Bangladesh, showing the mutual benefits of sharing a greater amount of water (2,3).	If Bangladesh implements the 50% use strategy, India incurs a loss, and so does Bangladesh, represented by (-1, -1).
If Bangladesh implements the Dalia project, India sees minimal benefit, and Bangladesh still gains some value, resulting in a lower payoff of (1, 1).	In the case of Bangladesh's Dalia project, both countries benefit, but Bangladesh loses out more than the previous scenario (2, 2).	For the Dalia project, while India still did not gain, the losses for Bangladesh are notable, resulting in (0, -2).
If Bangladesh does nothing, the situation deteriorates, resulting in a loss for India and a significant loss for Bangladesh, represented by (0, -2).	If Bangladesh chooses to do nothing, India's payoff is positive but lower, while Bangladesh incurs a significant loss, resulting in (1, -3).	If Bangladesh chooses to do nothing, both countries suffer considerable losses, demoted by (-2, -4), highlighting the severe consequences of no action taking place.

Nash equilibrium

In identifying the Nash equilibrium from the constructed matrix (Table 1), the strategy pair (60% share, Dalia project) with a payoff of (2, 2) represents a stable outcome where neither India nor Bangladesh benefits from unilaterally changing their strategy. India maximizes its gain by allowing a larger water share, while Bangladesh capitalizes on the Dalia project investments. This payoff matrix demonstrates the non-zero-sum nature of the conflict, where cooperation yields a higher combined payoff than competitive approaches. Ultimately, collaborative strategies benefit both nations more than short-term competitive gains, emphasizing the value of mutual cooperation in resource management.

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Behavioural Economics Insights

Incorporating behavioural economics into the Teesta conflict analysis highlights the influence of psychological factors, particularly loss aversion, on decision-making. Both India and Bangladesh overvalue potential losses. Bangladesh fears that accepting reduced water flow could lead to agricultural failure, while India worries that sharing more might jeopardize domestic needs. Political and emotional factors further frame the conflict as a zero-sum game, intensifying negotiations and preventing both nations from achieving mutually beneficial solutions.

Outcomes

The Teesta water conflict remains unresolved, despite multiple attempts to negotiate over the years. Past efforts have been delayed or ignored by regional interests, political interventions, and the lack of a formal treaty.

Insights gained from the different papers show that applying game theory and behavioural economics to some extent reveal that cooperation is essential to mutually benefiting the use of this resource.

CASE STUDY 2: Ecuador-Peru Border Conflict

The Ecuador-Peru territorial dispute can be modelled through the Chicken Game, where both nations engaged in military posturing to avoid backing down, eventually resolving the conflict with the 1998 Brasilia Peace Accords

Payoff matrix: Using an approximate payoff matrix, we can illustrate the conflict outcomes of the dispute had the nation's conflict not been resolved.

Table 2: Payoff Matrix for Ecuador- Peru Border conflict

		Peru Escalates	
		Peru Escalates	Peru De-escalates
Ecuador	Ecuador Escalates	(-10, -10)	(10, -5)
	Ecuador De-escalates	(-5, 10)	(0, 0)

Table 2 highlights the nature of the conflict. Both sides were incentivised to assert their strength and willingness to bear the costs of their actions in order to avoid appearing weak. This explains the repeated military confrontations, as both convinced each other that they would not back down.

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The eventual resolution, represented as (0, 0) payoff, came when both sides agreed to the Brasilia Peace accords. The presence of international mediators, along with economic and diplomatic pressure from nations, shifted the incentive to cooperate. This resolution demonstrates how game theory could provide a framework for understanding the strategic decisions of nations during conflict and their ability and willingness to bear the costs.

Behavioural Economics Insights

Behavioural economics offers insights into the decision-making processes of Ecuador and Peru during the border conflict. Cognitive biases, particularly overconfidence and loss aversion, significantly influenced their actions, often leading to suboptimal outcomes. Overconfidence bias led both nations to overestimate their military capabilities, as seen in the Cenepa War, where they engaged in multiple interventions without considering the costs. Loss aversion made them reluctant to cede territory, viewing it as a significant loss. Additionally, emotional framing of the conflict, emphasizing national honour, complicated negotiations and reinforced biases, making objective dialogue challenging.

Outcomes and lessons

The Ecuador-Peru conflict was resolved through the Brasilia Peace Accords in 1998, ending decades of disputes. Third-party mediation by Argentina, Brazil, Chile, and the United States was crucial, providing an unbiased platform for dialogue and fostering trust. The peace agreement included joint projects for infrastructure development in the border region, transforming a conflict zone into an area of opportunity. By focusing on mutual benefits, the accords laid the foundation for a thriving bilateral relationship.

CASE STUDY 3: Sino-Indian War Border Dispute

The Sino-Indian border dispute, analysed using the Hawk-Dove Game, shows how both countries alternated between aggressive posturing and diplomatic efforts, particularly evident in the 2020 Galwan Valley standoff.

Table 3: Payoff Matrix for Sino-Indian Border disputes

		China	
		China: Hawk	China: Dove
India	India: Hawk	(-10, -10)	(5, -5)
	India: Dove	(-5, 5)	(0, 0)

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In the context of the Sino-Indian dispute, the payoffs shown in table 3 are not just about territorial gains or losses but also involve maintaining the national image. For instance, if both India and China choose Hawk, the payoff matrix could reflect high military and economic costs for both (-10, -10)

If India chose Dove while China chose Hawk, China might gain strategic advantage with a payoff of (5, -5) and vice versa. These decisions are influenced by perceptions of the other's resolve and the willingness to escalate the conflict, making a mixed strategy equilibrium.

If India and China choose Dove, both nations choose a peaceful strategy, engaging in and negotiating and building confidence. This scenario represents a status quo situation where neither side gains nor loses significantly.

Behavioural Economics Insights

Behavioural economics provides insights into the decision-making processes of China and India, highlighting cognitive biases like loss aversion and overconfidence. Loss aversion drives both nations to prioritize avoiding perceived losses, such as territorial concessions, over achieving gains like peaceful relations. Overconfidence bias has led both countries to overestimate their military capabilities, evident in the 1962 war and the 2020 Galwan Valley standoff, escalating tensions along the Line of Actual Control (LAC). Additionally, framing effects contribute significantly, with leaders framing the conflict in nationalistic terms, influencing public perception and complicating negotiations.

Outcomes

Despite several rounds of diplomatic and military talks, the Sino-Indian border conflict remains unresolved, with both countries maintaining a huge military presence along the disputed areas.

The Galwan Valley has also led to economic repercussions, including India reducing their dependence on Chinese imports and increased scrutiny of Chinese investments.

Comparative Analysis of Case Studies

Similarities and Differences

Three cases—the Teesta River, the Ecuador-Peru border, and Sino-Indian disputes demonstrate a range of strategic interactions that can be analysed through various game-theory models. While each conflict is different in terms of their historic context, they share a common element of how countries look at national interests and make decisions.

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In the Teesta water conflict, India and Bangladesh's conflict has been analysed through the prisoner's dilemma. Both countries would benefit from cooperative water-sharing agreements, yet the lack of trust and political pressure from their respective countries has led them to follow the more non-cooperative route.

The Ecuador-Peru border conflict, on the other hand, can be analysed using the chicken game model. Here, both countries engaged to assert themselves while trying to avoid a large-scale war. The military confrontations of the 1990s highlighted this, where both nations mobilised troops but avoided direct, large-scale conflict. The risk of escalating to war was high, yet neither side wanted to back down and lose, much like the game of chicken trying to avoid swerving first. The resolution, where both countries agreed to compromise through the 1998 peace agreement, led to a successful de-escalation where both avoided collisions.

The Sino-Indian border dispute aligns more closely with the Hawk-Dove Game. Both nations have alternated between being aggressive (Hawk) and being diplomatic (Dove). The 2020 incident, where both sides engaged in a dispute.

One key difference among these conflicts lies in the nature of the stakes. The Teesta conflict is primarily about resources; the Ecuador-Peru and Sino-India conflicts, however, revolve around territorial sovereignty, which involves national image and military placement. The cost of conflict is measured not only in terms of economic terms but also in terms of human lives and diplomacy.

Role of Behavioural Economics in Both Cases

Behavioural economics provides a better understanding of the decision-making processes in these conflicts by highlighting the cognitive biases and emotional factors that shape the strategies. In the Teesta water conflict, availability bias plays a role. Indian and Bangladeshi leaders often base their decisions on recent water shortages, focussing on immediate issues rather than long-term benefits for the two nations.

In the Ecuador-Peru Conflict, overconfidence bias was seen in most nations that believed they could win the land through military interventions without engaging in a full-blown war. This misjudgement of the opponent's resolve and capabilities leads to repeated conflicts before a peaceful resolution.

The Sino-Indian conflict is influenced by status-quo bias, where both nations prefer maintaining the current territorial claims rather than risking any perceived losses. This was particularly evident in the Galwan Vally incident, where both nations refused to back down from their positions, leading to an expensive standoff. Loss aversion also played a role, as both countries

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are more willing to incur high costs to prevent losing territory than gain more by being more cooperative.

Conclusion

This review demonstrates how game theory and behsavioural economics provide valuable insights into geopolitical decision-making. By applying models such as the Prisoner's Dilemma, Chicken Game, and Hawk-Dove Game, we gain a deeper understanding of the strategic interactions and cognitive biases that drive conflict escalation and resolution. The case studies illustrate that while competition often leads to short-term gains, long-term cooperation yields more beneficial outcomes. Integrating these theories into policy development could enhance conflict resolution strategies and mitigate future crises. Moreover, the role of behavioural biases like loss aversion and overconfidence in decision-making should be considered in diplomatic negotiations to avoid escalation.

Reference

1. R, A. (n.d.). The evolution of cooperation https://ee.stanford.edu/~hellman/Breakthrough/book/pdfs/axelrod.pdf
2. BBC. (2022, December 14). *India-china dispute: The border row explained in 400 words*. BBC News. https://www.bbc.com/news/world-asia-53062484
3. Biato, M. F. (2016). The Ecuador-peru peace process. *Contexto Internacional*, *38*(2), 621–641.
4. Ayres, A. (2020, June 18). *The China-india border dispute: What to know*. Council on Foreign Relations. https://www.cfr.org/in-brief/china-india-border-dispute-what-know
5. Aaken, A. van. (n.d.). Behavioral International Law and Economics. https://journals.law.harvard.edu/ilj/wp-content/uploads/sites/84/552vanAaken.pdf
6. Biato, M. (n.d.). ProQuest | Better Research, Better Learning, better insights. https://www.proquest.com/scholarly-journals/google-scholar/docview/852813310/se-2, 621-641
7. Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263-291.
8. Wikimedia Foundation. (2024b, September 9). *Nash equilibrium*. Wikipedia. https://en.wikipedia.org/wiki/Nash_equilibrium

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

9. Neumann , & Morgenstern. (1944). Theory of games and Economic Behavior., 42-46

10. Nowak, M. A., & Sigmund, K. (1993). A strategy of win-stay, lose-shift that outperforms tit-for-tat in the Prisoner's Dilemma Game. *Nature*, *364*, 56-58.

11. Wikimedia Foundation. (2024c, October 13). *Prisoner's dilemma*. Wikipedia. https://en.wikipedia.org/wiki/Prisoner's_dilemma

12. Schelling, T. (1966). *The diplomacy of violence.* Yale University Press.

13. Simon, H. A. (1955). A behavioral model of rational choice. https://iiif.library.cmu.edu/file/Simon_box00063_fld04838_bdl0001_doc0001/Simon_box00063_fld04838_bdl0001_doc0001.pdf, 99-118.

14. *Why we should all worry about the China-India border dispute*. United States Institute of Peace. (2023, December 18). https://www.usip.org/publications/2023/05/why-we-should-all-worry-about-china-india-border-dispute

