

Conflicts and Cooperation: A Game Theory Analysis of the Israeli–Palestinian Conflict

“THE NATIONS MUST CONTINUE TO LEARN WAR, IN ORDER NOT TO FIGHT!”

Robert J. Aumann

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WAR AND PEACE

Wars and conflicts in general are some of the main sources of human misery. Cooperation is an essential prerequisite for the prosperity of society. If life was in an anarchic “state of nature” with its struggle of every man against every man (homo homini lupus) it would be, in Thomas Hobbes’ (1651) famous phrase, “solitary, poor, nasty, brutish, and short”.

Social scientists throughout history have tried to understand the fundamental causes of conflict and cooperation. The development of game theory in the middle of the twentieth century has led to major new insights and enabled researchers to analyze the subject with a more profound rigor. In fact, over the last forty years, game theory has become a universally accepted tool and language in economics and in many areas of the other social sciences. Current economic analysis of conflict and cooperation builds almost uniformly on the foundations laid by mathematician Robert Aumann

and economist Thomas Schelling. In this essay, we will analyze one of the most complex conflicts of the past century: the Israeli–Palestinian conflict. We will begin by briefly introducing the conflict, its history, and mentioning some of the past peace accords. After this, by making use of game theory rationale and formalization, we will be able to dissect the conflict, analyze it part by part, and simplify it in a model to be able to understand it as best as possible, all while attempting to determine a possible path of cooperation between the two actors.

Essentially, the only viable path to lasting peace for the Israeli–Palestinian conflict resides in cooperation through repeated interaction between the players, an appropriate discount rate and credible threats of punishment, combined with serious reflection on the negotiation and political leadership for the common good.

A BRIEF INTRODUCTION TO THE ISRAELI–PALESTINIAN CONFLICT

First off, it is important to understand that the ideology behind each player is extremely religious. Both, Islam and Judaism

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hold the Holy Land to have considerable religious value, specifically Jerusalem, where the Jews have the Wailing Wall, their most religious site, and the Muslims have the Dome of the Rock, their second most religious site.

Moving past the rise of the late 19th century Zionist movement and the 1917 Balfour Declaration, both of which play important roles in the birth of the “state for Jews”, in 1947 the United Nations (UN) motioned for the partitioning of

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British-owned Palestine into two states: a Jewish state and an Arab state. The Arabs detested the plan, sparking the first Arab-Israeli War one year later, during which the neighboring Arab countries (Egypt, Jordan, Iraq, Syria, and Lebanon) invaded the newfound state of Israel. When a ceasefire was reached in 1949, Jordan took control of the West Bank, and Egypt claimed the Gaza strip as territory.

Following this conflict, several wars ensued later throughout the decades and territorial boundaries fluctuated, particularly the Gaza Strip, the West Bank, and the Golan Heights of Syria. Throughout the bloodshed, Israel had to deal with military organizations such as Hamas in the Gaza strip and Hezbollah in Lebanon. Palestinian uprisings, called intifadas, also arised, forcing Israel to allow the formation of a Palestinian government in the West Bank after the negotiated Oslo Accords in 1993 and 1995.

However, in spite of the state of Palestine being recognized by the UN and over 100 countries, the Israeli government still believes that the land of Judea and Samaria should belong to the Jews. The problem persists because both states have reasonable claims to the disputed territories and declare Jerusalem as their capitals. Israel has many settlements throughout the West Bank, while Palestinian population is scattered about the territory. From the Israeli point of view, the growth of a hostile state from within its borders significantly jeopardizes Israel's security.

The most recent developments are mainly the normalization of diplomatic ties between Israel and other Arab nations, including the



United Arab Emirates, Bahrain, Sudan, and Morocco.

This is the current picture of the Israeli-Palestinian conflict, with the most significant decision lying in deciding who gets to control the West Bank and the Gaza Strip. In early 2020, former United States president Donald Trump proposed a plan that would divide the territory into two states, as have many actors in the past (Haddad, 2020), but as was previously mentioned, this situation is not so easily solved. Now we will study how this conflict, and all conflicts in general, can be analysed with the use of game theory and some concepts of behavioral economics.

GAME THEORY ANALYSIS

Game theory is a branch of economics that studies the ways in which the decisions taken by different rational actors (or players) produce outcomes with respect to the preferences (or utilities) of these players. Simply put, it is a formal study of strategic decision making. Even though some might consider game theory as somewhat detached from the reality of the conflicts or interactions it studies, the models we can create with it actually provide us

with creative tools for conceptual exploration and more precise communication of conflict, which can point us in the right direction to find resolutions.

On this note, it is common knowledge that people think of armed conflict as a zero-sum game –a game with a winner and a loser, in which two players' utility preferences are inversely correlated. However, Nobel Prize-winning economist Thomas Schelling stresses in his game theory studies that war typically has a non-zero-sum dynamic. The Middle East is now proving his point: continued fighting is massively lose-lose so peace would be win-win.

Yet, peace never comes. How does a game theorist account for this cruel irrationality? We can find a myriad of explanations stemming from different disciplines and, collectively, they can point toward the most plausible path to peace. Therefore, by analyzing this conflict with the rationale and formalization offered by game theory, we can infer possible long-term solutions which Israelis and Palestinians can attain according to these economists. In this essay, we will specifically use arguments to study conflicts used

by game theorists Robert Aumann and Thomas Schelling.

A. Aumann, Schelling, and Cooperative Games to Resolve Conflicts Robert Aumann, an Israeli-American mathematician and recipient of the Nobel Prize in Economics, said in his 2005 Nobel Prize acceptance speech that if he had to summarize economics in one word, it would be “incentives”. Therefore, among other things, we will study the incentives that lead to conflict, and those that could prevent it. Specifically, we will discuss repeated games and how they relate to the Israeli-Palestinian conflict.

Repeated games model long-term interaction. The theory of repeated games is able to account for phenomena such as altruism, cooperation, trust, loyalty, revenge, or threats –phenomena that may at first seem irrational from the classical economics seek-your-self-interest point of view– in terms of the “selfish” utility-maximizing paradigm of game theory and neoclassical economics. In repeated games, however, strategic equilibrium (the point in which no player can obtain a better outcome without worsening the other player’s outcome) does include this type of phenomena.

The theory of repeated games is extremely rich and deep, but Aumann focuses on one aspect: cooperation. He says that “repetition enables cooperation”. We use the term “cooperative” to describe any possible outcome of a game, as long as no player can guarantee a better outcome for himself. It is important to emphasize that, in general, a cooperative outcome is not an equilibrium; it is rather the result of an agreement. For example, in the well-known Prisoner’s Dilemma game (see figure 1), the

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If the game is played just once then Israel is clearly better off by dividing greedily, and Palestine by acquiescing (indeed, these strategies are dominant). Palestine will not like this very much -they are getting nothing-, but there is not much that they can do about it. Technically, the only equilibrium is (G,A) . But in a repeated game, there is something that Palestine can do. They can threaten to punish Israel for ever afterwards if they ever divide greedily

outcome in which neither prisoner confesses is a cooperative outcome; it is in neither player’s best interests, though it is better for both than the unique equilibrium. A simple model of the Israeli-Palestinian conflict using Aumann’s cooperative games theory can be seen in figure 2. In this matrix, there are two players, Israel and Palestine. Israel must decide whether both it and Palestine will receive the same amount of territory, 10, or whether it will receive ten times more, and Palestine will receive ten times less (100,0). Simultaneously, Palestine must decide whether or not to take a punitive action, which will harm both Israel and itself. If it does so, the division is cancelled, and instead, each player gets nothing. The outcome (E, A), yielding 10 to each player, is a cooperative outcome, as no player can guarantee more for himself. But like in the Prisoner’s Dilemma, it is not achievable in equilibrium because each player is just looking out for their own short-term self-interests.

Why are cooperative outcomes interesting, even though they are not achievable in equilibrium? The reason is that they are achievable by contract –by agreement– in those contexts in which contracts are enforceable. If this is the case, Israel and Palestine can achieve the cooperative outcome (E, A) by agreement. If not, (E, A) is, for practical purposes, unachievable. Now, we will discuss the relation of cooperative game theory to repeated games. The fundamental insight into the relation of Aumann’s cooperative games to the previously mentioned repeated games (Schelling) is that repetition works like an enforcement mechanism: repetition enables the emergence of cooperative

outcomes in equilibrium, even when each person is acting in their own best interests. Intuitively, this is well-known and understood: people are much more cooperative in a long-term relationship. They know that there is a tomorrow, and that inappropriate behavior will be punished in the future.

Illustrating this with the previous game, if the game is played just once, then Israel is clearly better off by dividing greedily, and Palestine by acquiescing (indeed, these strategies are dominant). Palestine will not like this very much –they are getting nothing–, but there is not much that they can do about it. Technically, the only equilibrium is (G, A). But in a repeated game, there is something that Palestine can do. They can threaten to punish Israel for ever afterwards if they ever divide greedily. So, it will not be worthwhile for Israel to divide greedily. Indeed, in a repeated game, this is actually an equilibrium in the sense of Nash (Nash equilibrium). As a result, Israel’s strategy is to “play E for ever”, and Palestine’s strategy is “play A as long as Israel plays E; if Israel ever plays G, play P for ever afterwards”.

The factor that maintains the equilibrium in these games is the threat of punishment, commonly known as “MAD” (Mutually Assured Destruction), the motto of the Cold War. Some conditions necessary for this to work are:

1. The discount rate must not be too high. The players must not be too interested in the present as compared with the future. Otherwise, cooperation is impossible because it would still be worthwhile for Israel to act greedily. In other words, for repetition to engender cooperation, the players must not be

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What is the best way to achieve lasting peace? The worst possible option would be a violent response. The only way to peace is the creation of two states and for this it is urgently necessary to restart the discussions between Israel and Palestine. It is important to reach agreements that benefit the losers. I would like to point out the importance of reflection and the need for good political leaders to bring this process to a conclusion of lasting peace



too eager for immediate results. The present must not be too important. If you want peace now, you may well never get peace. But if you have time and patience, then you may get peace.

2. The threat of punishment must be credible. If you have to enforce a punishment, then, after you punish, you are still in equilibrium – you do not have an incentive to deviate. Consequently, any player who does not carry out a prescribed punishment is punished by the other player for not doing so.

To summarize, in a repeated game of the conflict the cooperative outcome (E, A) is achievable in equilibrium. This is a special case of a much more general principle, known as the Folk Theorem, which states that any cooperative outcome of any single game is achievable as a strategic equilibrium outcome of its repeated game, even if that outcome is not an equilibrium outcome of the single game (Leyton-Brown, n.d.). Conversely, every strategic equilibrium outcome of the repeated game is a cooperative outcome of the single game. In brief, for any single game, we have The Folk Theorem: “the cooperative outcomes of [the single game] G coincide with the equilibrium outcomes of its [repeated game] supergame G.” Differently put, repetition acts as an enforcement mechanism: it makes cooperation achievable when it is not achievable in the one-shot game.

With this, we see that we should perhaps change direction in our efforts to bring about peace or an agreement in the Israeli-Palestinian conflict and all conflicts in general. Up to now, all the effort has been put into resolving specific conflicts. Instead, we should shift the emphasis and study war

in general. If war is rational, once we understand that it is, we can at least somehow address the problem. If we simply dismiss it as irrational, we can’t address the problem. We should start studying war and conflicts from all viewpoints, for their own sake. If we are able to understand what brings them about, then we might, eventually, achieve peace.

CONCLUSION

This conclusion will try to answer the following fundamental question: What is the best way to achieve lasting peace? There is an urgent need to restart the discussions between Israel and Palestine in order to achieve a long-term peace. There seems to be a common understanding between the two sides that the worst possible option would be a violent response.

Following the repeated games game theory analysis to assure cooperation, we can see how the only path to peace is the creation of two states. This would begin with factors such as the mutual recognition as states, the establishment of diplomatic relations, the de-escalation of tension, economic agreements that protect Palestine and agreements for disarmament, inter alia.

I want to point out how important it is to make agreements that benefit the losers. We have the historical example of the World Wars. The Treaty of Versailles (1919), signed at the end of the First World War, left the defeated in a very bad place. This tension has been considered one of the main causes of the outbreak of World War II. With this experience, at the end of World War II in 1945, other types of agreements were sought, more beneficial to the losers. This marked a before and after. A parallel could be drawn with this situation. Palestine would be the one to lose out economically.

Finally, I would like to point out the importance of reflection and the need for good political leaders to bring this process to a conclusion of durable peace. This is what Nickolay Mladenov, UN Special Coordinator for the Middle East Peace Process, says:

“What is needed is political leadership and serious reflection on what needs to be done to bring the parties back to the negotiating table. (...) It is time to listen to proposals to move the process forward and find the way back to a consensus mediation that will guarantee the resumption of substantive negotiations” •

ANNEX

Figure 1. Prisoner's Dilemma, n.d.

		PRISONER B	
		Remain silent	Confess
PRISONER A	Remain silent	A gets 2 years B gets 2 years	A gets 8 years B gets 1 years
	Confess	A gets 1 years B gets 8 years	A gets 5 years B gets 5 years

Figure 2.

		PALESTINE	
		Acquiesce	Punish
ISRAEL	Divide Evenly	10,10	0,0
	Divide Greedily	100,0	0,0

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