

Strategic Game Theory for Managers—Japanese Movie Rashomon

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Abstract: *A Game Theory provides a framework that attempts to capture the interaction of two or more decision makers, evaluating how the decision made by one player has an effect on the decision made by the other. It is widely used in decision making process, and has a number of interesting applications. During the paper, we will first develop the basic tools needed to understanding the concepts behind such discipline. Therefore, the first sessions of the paper will be focused on understanding what is a game, what are the elements of a game, and what are some of the classical games used to model well-known situations. In the second part, we will devote more attention to some applications of game theory. We will directly work on Japanese movie Rashomon case, and foster the strategic abilities of readers concerning the decision making process. The idea behind the case is that Game Theory can be used through the use of real world example, rather than through the introduction of abstract concepts and notions. Therefore, during the course, every concept will be presented in the context of real world situations and, thus, games and situations that arise in business settings will be thoroughly analyzed. An important part of the paper is to identify a situation of interest from the real world, analyze such situations using the Game Theory tools provided during the course, and offer specific strategic advises to the players of the game.*

Keywords: *Game theory, Nash Equilibrium, Mixed Strategy in Tennis, Dating and Paying Taxes, Evolutionary Games: Cooperation, Mutation, and Equilibrium*

1. Introduction

In this paper I try to analyze the complex of Rashomon. Rashomon is a movie that was realized in 1950, by the Japanese Director Akira Kurosawa^[1]. The movie relates four different version of the story of a Samurai who had been killed in a forest after having seen his wife being raped in front of him by the famous bandit, Tajomaru.

Through our analysis we demonstrate that each actor has an incentive to lie, allowing us to conclude that the scenario is a case of Multi-person Prisoner's Dilemma. Due to the complexity of the Multi-person Prisoner Dilemma but its similarities with the two players Prisoner's Dilemma in term of the dominant strategy, we analyzed the game with the two players Prisoner's Dilemma. The final outcome tells that whatever the other players are playing (telling the truth or lying), each player will always tend to lie even though they would be better off by all telling the truth.

Finally by using backward induction we tried to find an approximate truth of the game. We eliminated what we considered the biased elements of truth for each character in their respective story and kept the elements for which they had individually no incentive to lie.

2. Summary of the movie

Rashomon is a 1950 Japanese movie and known as one of the most valuable movies. It is also one of the best works of Japanese legendary movie director Akira Kurosawa, which first time opened the door from Japanese film to world's cinema. Rashomon explores human weakness and the ugly truth of human nature. As what Kurosawa mentioned, "Human beings are unable to be honest with themselves about themselves. They cannot talk about themselves without embellishing." In 1951, the movie won Golden Lion Award at Venice Film Festival, "Italian Film critics Award, and Honorary award as the most outstanding foreign language film released in the United States.

The story took place in 12th century in Japan, a samurai (the Husband) while he was traveling with his wife (the Woman), was killed in the jungle by the famous bandit Tajomaru. The Observer (firewood

dealer), the bandit (Tajomaru), the Woman and the Husband (speaking through a medium) have all been arrested by the police to provide evidence. However, with the purpose of their self-interest, the intension of protecting themselves, they provided four completely different versions of the story.

2.1 Problem Statement

2.1.1 The bandit (Tajomaru)

The bandit Tajomaru saw the husband and the woman walking by the forest and he decided to have her. However, he killed the husband but claimed out that he did not mean to kill him at the beginning. He emphasized that the woman was willing to make love with him even though he was trying to rape her at the first time. Before he actually had her, he brought the Husband somewhere else telling him that precious weapons were hidden in the forest. He had a fight with the husband and tied him up, and then he took the woman to see her husband. However when she saw her Husband tied she fought him back with a dagger. When Tajomaru dominated her she started to cry and dropped her dagger on the ground. Tajomaru also mentioned that he had her without having to kill the husband and he had no incentive and plan to kill him. Later on, the woman told him that one of them had to die and whoever wins, she will run away with him. Therefore, Tajomaru went back fight with the husband again and ultimately killed the husband.

2.1.2 The Woman (the wife of Samurai)

The woman was crying constantly at the police station and insisted that Tajomaru took advantages of her. She described that after Tajomaru raped her, she ran to see her husband that was tied up with ropes. Then she passed the sword to him and asked him to kill her but he just looked with disgust at her. Then she reported that she fainted. Later on when she regain consciousness, she saw that the dagger was in her husband's chest. She was very scared so she ran away. The woman emphasized that she wanted her husband to forgive her; she even tried to kill herself afterwards but unfortunately failed.

2.1.3 The Husband (through the medium)

After Tajomaru attacked the Woman, he tried to convince her to leave her Husband and run away with him. However, the Woman stimulated Tajomaru to take her with him and kill the husband. Nevertheless, Tajomaru was shocked by the woman's behavior so he threw the woman on the ground, turned back to husband and even asked him either he should kill the woman. She got scared and ran away. At that time, the husband felt really sad, disappointed and could not stop crying.

2.1.4 The Observer (Firewood dealer)

At the court the Observer claimed that he arrived on the crime scene after it took place. The only things that the Observer saw were a woman's veil, a man's hat and the dead body of the Husband.

Later in the movie, we come to know that when the Observer hears the story of the Husband telling that he committed suicide with the dagger, the observer claims that the husband was killed with a Korean sword. So the Traveler (background character) who is listening to the four successive stories suspects the Observer of having seen more than only the dead body (otherwise how would he know that the weapon was a Korean sword). At this point, the Observer tells another story.

Present during the entire scene, the Observer saw Tajomaru, the bandit on his knees begging for forgiveness to the Woman after he had raped her. Tajomaru claimed that she should marry him or he would kill her. The Woman replied that it was not her role to decide implying that the two men should have a deadly duel to win her and she freed her husband from the ropes with the dagger.

The Husband replied cowardly that he did not want to risk his life for such a "whore" and that he would regret more the loss of his horse than his wife.

The Woman, looking at both men, claimed that they were both cowards. While she expected her Husband to kill Tajomaru and ask her to committed suicide, she expected Tajomaru to be a braver man.

After this the two men entered in a timorous dual until the Husband fell on his back was cowardly killed by Tajomaru. Finally, the Woman fled without Tajomaru.

2.2 Incentive to lie

Each of the four characters present in the Rashomon's forest and responsible for appearing in court has an incentive to adapt the story to her or his self-interest. Thus, while each character reports on the

same story, each character emphasizes on points that are important for themselves to such an extent that the four stories present some incompatibilities.

In the following part we analysis the underlying reasons for each character to modify the truth.

2.3 Tajomaru

As a well-known bandit with a long list of crime records behind him, Tajomaru knows that he is going to be sentenced to death whatever happens. Hence, we assume that the only positive way-out left to him is the possibility to die with a certain pride and honor as a Japanese man. For this reason, he prefers to say that while he was trying to rape the Woman she felt for him and finally gave her consent to make love with him. In addition, unlike the description of the scene by the Observer where Tajomaru and the Husband fight cowardly, Tajomaru emphasizes that he fought bravely and killed the Husband after 23 sword exchanges.

2.4 The Woman

Being raped by Tajomaru, the Woman has most probably lost her dignity but we assume that she has an incentive to demonstrate that she was loyal to her Husband and that she has a great sense of honor. For this reason, she claims that after having freed her Husband who witnessed the rape, she begged him to kill her. She also explains that after having regained consciousness and seen her Husband dead, she tried to commit suicide in the river.

More importantly, we assume that, as she has a strong sense of honor, she most probably initiated the duel between the two men. Indeed after such an awful humiliation, she could only have stayed with any of the two men if one was killed by the other. Nevertheless, admitting this in front of the court may cause prejudice to her. Thus, we believe that she has an incentive to hide this fact.

2.5 The Husband

Even if the Husband is dead and speaks through a medium, we assume that he wants people to remember that he was an honorable man who loved his wife. Hence, through his story, the Husband wants to show that he was committed to his wife and that she was not only willing to betray him with Tajomaru but also asking Tajomaru to kill him.

2.6 The Observer (firewood dealer)

The Observer initially claims that he walked on the crime scene afterwards and that he only found the Husband dead body. Nevertheless, we come to know that when the Observer hears the story of the Husband telling that he committed suicide with the dagger, the observer claims that the husband was killed with the Korean sword. So the Traveler who is listening to the four successive stories suspects the Observer of having seen more than only the dead body (otherwise how would he know the weapon was a Korean sword). At this point, the Observer tells another story but still omitting to tell what happened with the disappeared dagger.

We assume that the Observer did not report the entire story to the authorities because he stole the dagger after Tajomaru and the Woman left the forest.

3. Game theory application

3.1 Multi-person Prisoner's Dilemma

As we have seen, in this game every of the four actors has an incentive to lie instead of telling the true story to the court. Even though all of them would be "morally" better off by telling the truth, they individually prefer to "betray" the others and tell a "lie" that suit their self-interest described previously.

3.2 Simultaneous game

As everyone has to tell his or her story separately from the others and without having the opportunity to collaborate with the others, we conclude that the game is played simultaneously. Hence, while none knows what the others are going to tell, everyone knows that each character has a good reason to tell a

different story.

3.3 Mathematical application's limitation

We assume that this game should be played with a multi-dimensional matrix. However, for simplicity purpose, we have decided to analyze it with a two player prisoner's dilemma matrix. The implications of this are that our analysis is limited with regards to the following outcomes:

In reality, the initial payoffs are different for every actor due to their relative incentive to lie

The individual payoffs vary according to the number of players telling the truth or lying.

Nevertheless, according to the theory the Multi-person Prisoner's Dilemma with simultaneous game, like traditional Prisoner Dilemma (2 players) is based on the following statements:

"Regardless of what the other players do, each player receives a higher payoff for defecting behavior (Lie) than for cooperating behavior (tell the truth)."

"All players receive a lower payoff if all defect than if all cooperate."^[2]

Payoffs

Assuming a simple prisoner dilemma, the payoffs are represented by points of "shame". On a scale from 1 to 4, less point is equal to less shame and more point is equal to more shame.(Table 1)

If two players tell the truth the individual payoffs are 2

If one player tells the truth and the other lies the respective payoffs are 4 and 1

If both players lie their individual payoffs are 3

Table 1 Prisoner's Dilemma Model

		Player 2	
		Tell the truth	Lie
Player 1	Tell the truth	2	1 ✓
	Lie	4	3 ✓

As we have seen every player as an incentive to lie whatever the others tell. Lying is the dominant strategy over telling the truth. The Nash equilibrium is always when everyone lies even though all players would be better off all telling the truth.

3.4 Possible truth using backward induction

Rashomon, is an exploration of subjective perception and reality. The movie tells us not only that every character has its own unconscious perception of truth and conscious incentive to alter the truth but also that the observers have a biased perception of truth because they unconsciously alter the observed information to their own comfort^[3].

In the following section we are trying to rebuild a certain model of truth by eliminating what we consider to be biased elements of truth for each character. For this, we analyze elements in each of the four stories for which the respective teller had apparently no incentive to lie. This method certainly provides a different version from the "real truth" with our own bias. Nevertheless it is certainly more objective than any of the four stories taken separately.

3.5 Elements of truth from the Observer (the firewood dealer)

Tajomaru most probably raped the Woman in front of the Husband tied with ropes.

Tajomaru begged the Woman to be with him after he raped her.

The Woman freed the Husband (cut the rope that was tiding her Husband) and asked for a fight between the two men to stay with the survivor.

The Woman told that both men were cowards.

The Husband should have tried to kill Tajomaru and asked her wife to commit suicide afterwards.

She expected a better way out from Tajomaru.

Tajomaru most probably killed the Husband.

The Woman most probably ran away without Tajomaru.

The observer stole the dagger after the crime.

3.6 Elements of truth from Tajomaru's story

Tajomaru probably set an ambush to the Husband telling him that he had some precious weapons hidden somewhere in the forest.

The Husband followed Tajomaru and got caught by Tajomaru who then tied the Husband up.

Tajomaru did not fight that intensively with the Husband and probably killed him not as honorably as he cited.

He did not mean to kill the Husband until the Woman asked for a death duel between the two men.

He stole the Japanese sword, the horse, the bow and arrows.

He did leave the dagger on the scene.

3.7 Elements of truth from the Woman's story

She initiated the deadly duel and stated that she would stay with the survivor (like this the secret of the rape stays within the "couple").

The Husband was disgusted by her Woman who got raped in front of him.

3.8 Elements of truth from the Husband's story (through the medium)

Tajomaru might have asked the Woman to be with him.

The husband did not commit suicide.

4. Conclusions

In short the overall story would look like that: Tajomaru probably set an ambush to the Husband telling him that he had some precious weapons hidden somewhere in the forest. The Husband followed Tajomaru and got caught by Tajomaru who then tied him up. Tajomaru most probably raped the Woman in front of the Husband. Tajomaru begged the Woman to be with him after he raped her.

Tajomaru did not mean to kill the Husband until the Woman asked for a death duel between the two men. The Woman freed the Husband with the dagger and asked for the fight claiming that she would stay with the survivor.

The Husband was disgusted by her Woman who got raped in front of him.

The Woman told that both men were cowards. The Husband should have tried to kill Tajomaru and asked her wife to commit suicide afterwards. She expected a better way out from Tajomaru.

Tajomaru did not fight that intensively with the Husband and probably killed him not as honorably as he cited.

Tajomaru most probably killed the Husband with the Korean sword (not the dagger). He stole the Japanese sword, the horse, the bow and arrows. He did leave the dagger on the scene.

The observer stole the dagger after the crime.

References

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