A Game-Theoretic Analysis of Tiananmen Square Protest in 1989

Abstract

The Tiananmen Square Democratic Protest, which nearly set China on the road towards democratization, is undoubtedly one of the severe tragedies that have shaped the history of China. In fact, if we trace the reality of that time and comprehensively examine the ideas and actions of both sides, we find that it would have been possible for both sides to find a peaceful compromise. This article illustrates the process of the Tiananmen Protest in Beijing 1989 by game-theoretic models, using the Theory of Moves. It can be shown that at the first stage of the protest, both players attempted to use their threat powers to induce a better payoff for themselves, but the overwhelming power of the party ensured the effectiveness of its threat power, successfully achieving its best payoff and to some extent mitigate the severe condition. In the second stage, however, the students became myopic under the influence of the emotional mass and gave up the chance of achieving a better outcome, resulting the game in a Pareto-inferior state with no actual winner.

Key word: democratic movement, game theory

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The Tiananmen Square Democratic Protest, which nearly set China on the road towards democratization, is undoubtedly one of the most significant events that have shaped the history of China. Today, many people feel that, if the government had not suppressed the protest, or the demand of the students had not been so radical, the tragedy would be avoided and China might have been closer to a democracy today. In fact, if we trace the reality of that time and comprehensively examine the ideas and actions of both sides, we find that it would have been possible for both sides to find a peaceful compromise. But the students, who were influenced by the emotional masses, became myopic, failing to choose the outcome that would have satisfied both sides.

This article will reexamine the process of the protest by game-theoretic models, using Theory of Moves[1]. Assuming that both sides, the students and the government, are individual players who have consistent preference in each game and are essentially rational to rank and pursue their payoffs, I argue that in the early stage the students made successful strategic choice but they then became shortsighted in the second stage, which led to the crackdown. To explain the historical process on detail, I will divide the whole event (game) into two sub-games: first, the protest action strategy of students and the reaction of the government after the death of formal Party Chief Hu Yaobang; the second game, describing the condition of the confrontation before the crackdown, will

[1] The Theory of Moves describes optimal strategic calculations in normal-form games in which the players can move and countermove from an initial state. Prof. Steven Brams first published it in 1994 in the book *Theory of Moves*. This paper is an application of this theory. Related conceptions and rules can be seen in footnotes and appendix.

substantiate that the students failed to make a wise choice, which resulted in the crackdown.

Stage 1: Threats from Each Side (Apr 15th-27th)

The reforms that began in the late 1970s greatly boosted the economy of China and improved the living standard of people. But at the same time, some policies allowed government officials with much political power to extract enormous economic privileges under the incomplete market system; such policies therefore caused the inflation. On the other hand, as China was gradually opening to the world, the influx of democratic and liberal thoughts strongly influenced people's, especially college students', minds. The dissatisfaction with the worsening domestic condition and the yearning for freedom came to a head the death of Hu Yaobang[2] on April 15th. On that day, the demonstration began. The difference between the students and the government began with a disagreement as to how to evaluate the merits and demerits of Hu. The students wanted to reevaluate Hu by admitting his promotion of democracy and freedom; the party, on the other side, did not want to consider it. Eventually this disagreement escalated into a public protest. The government found it was important to end the protest immediately and sustain a stable political environment to ensure the smooth implementation of economic reform.

The two players faced the following choices:

Students: demand democracy in a slight or an exhaustive level. A slight level means the demand is circumscribed in policy changes, such as reevaluating Hu, punishing corruption, admitting the legal status of autonomous student union and allowing private

[2] Hu, as a representative of reformist, was ousted because of his tolerant attitude toward the democratic protest in 1986. After his death, the CCP still claimed that it was his mistake. The students were discontent with such comment and urge the party to reevaluate Hu.

press and ending the censorship. An exhaustive demand requires the CCP to abandon one-party dictatorship and commence the democratization immediately.

The party: reject or accept the demand of students. Rejection may result in the uncompromising tune to condemn the protest as counterrevolutionary and suppress it. Acceptance, on the other hand, will lead to the change of Chinese politics, which may endanger the ruling position of the CCP.

I then designate the strategies of students as "demand slightly" (S) and "demand exhaustively" (E); and the CCP's strategies as "reject" (R) and "accept" (A). These strategies available to each side give rise to four possible states:

1. S-R: the conflict will remain but won't end in violence. The students' demonstration effort will be in vain but since they do not claim to overthrow the ruling position of the CCP, the party will not use drastic force to suppress or revenge the students after the suppression.

2. S-A: a compromise is likely to be reached. Although failing to realize democracy immediately, students will hold their justification to later effort for pursuing democracy. The party will temporarily maintain the ruling position but should redeem the requirement from the students.

3. E-R: the conflict will escalate. Since the students' pursuit is to overturn the communist regime, the party is justifiable to condemn them as counterrevolutionaries and use armed force to repress the demonstration. Both sides will suffer huge loss.

4. E-A: the student will successfully force the party to begin democratization and the CCP may lose the ruling position.

Each state is shown in the payoff matrix (figure 1).

		The Party	
		Reject	Accept
The Students	Demand slightly	<u>2,4*</u> [2,4]	3,3# [2,4]
	Demand exhaustively	1,2 [2,4]	4,1 [2,4]

Key: (x,y)=(payoff to the students, payoff to the party)
[x,y]=[payoff to the students, payoff to the party] in AG game
4=best; 3=next best; 2=next worst; 1=worst
Nash equilibrium underscored
Dominant strategy shaded
#=Students' deterrent threat state
*=Party's compellent threat state

Figure 1

The party will suffer its worst two payoffs if students demand exhaustively: acceptance means the party will give away its political monopoly status while rejection, although suppressing the protest by force, the huge casualties may result in a deteriorating image of the party dictatorship both domestically and internationally. On the contrary, if students demand slightly, the rejection of the party will not cause violence conflict and it is easier for the party to placate the students, but still holding its leading position which is given as the best payoff; the acceptance of slight demand let the party maintain the political monopoly but it should respond the demand and gradually commence the political reform, which gives it the second best payoff by maintaining power. On the other hand, the party's acceptance will let the students receive their best two payoffs by more or less making progress of their democratic movement. But the rejection, especially when they demand exhaustively, will lead to violent conflict and their efforts will all be in vain, which leaves with the worst payoff.

In the game, the party has its dominant strategy of R. By anticipating the party's choice, the students will choose S, making S-R the solution. At this state, the students only receive their next worst payoff, but they can induce (3,3) by a deterrent threat[3]. By choosing S, the students can threaten E, the party's two worst states including the party's breakdown state[4] E-R, and force the party to accept (3,3). At the same time, E-R is also the breakdown state of the students, which entails the party to exercise the compellent threat[5] power to stay at R, and forces the students to choose S, which leads to (2,4).

The exercise of these two kinds of threat power was represented in this phase of demonstration. The death of Hu Yaobang incurred large scale of public memorial activities in many cities. On Apr 18th, students protested on the Tiananmen Square proposed seven pleas[6] to the party, including reevaluating Hu, punishing corruption and ending the press censorship, which can be seen as "slight demand". Facing the surge of protest, the party seemed reluctantly and temporarily to "accept" the "slight demand" of the students, by conducting several dialogues with protesting students in local level, trying to pacify them[7]. But the students wanted the party to officially accept their demands and confirm the state of S-A (3,3). A few days later, the students began to exercise their threat power, by threatening to "demand exhaustively" shifting the focus to

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[3] This game involves in threat power. In a two-person game that is repeated, threat power is the ability of a player to threaten a mutually disadvantageous outcome in the single play of a game to deter untoward actions in the future play of this or other games. A threatener's deterrent threat is a threat to move to another strategy to induce the threatened player to choose a state, associate with the threatener's initial strategy, that is better for both players than the state threatened.

[4] Breakdown state is the Pareto-inferior state that a threatener threatens to implement, by choosing its breakdown strategy, unless the threatenee accedes to the threat state.

[5] A threatener's compellent threat is a threat to stay at a particular strategy to induce the threatened player to choose its (as well as the threatener's) best state associated with that strategy.

[6] The Power of Tiananmen: State-Society Relations and the 1989 Beijing Student Movement. Chicago: University of Chicago Press. April 1st, 2004. P148

[7] For example, Jiang Zemin, the General Secretary of Shanghai party committed and then formal General Secretary of the CCP, conducted the dialogue with the students and alleviated the radical emotion.

the pursuit of democracy[8]. However, the power of the students failed to sustain their effort. On April 26th, the party determined to deal the protest in a tough way, publishing an editorial on the party's press, "People's Daily", condemning the protest was used by counterrevolutionaries to overturn the communist regime, which means to stay at its dominant strategy R and threat the students to choose S. Acknowledging the possibility that the party will use military to suppress, on the protest of April 27th, the students went back to their previous demand and claimed that they still support the party. This game ended here with the success of the threat power of the party, achieving its best payoff under the party's dominant and compellent threat strategy at the state of S-R (2,4).

Stage 2: The Myopic Choice of the Students (May 20th-June 4th)

The result of previous game, S-R, although avoiding violent confrontation, did not fundamentally solve the conflict. Since the demand of the students was rejected, in order to gain more attractions and thus support, the students in Beijing continued the demonstration and even turned to hunger strike on May 13th. Facing the increasingly severe condition, the conservatives in the party who propose to implement force suppression ousted the reformists, represented by the General Secretary Zhao Ziyang, who had sympathy on the students, and decided to conduct martial law from May 19th. Under the pressure of approaching armies, the student leaders announced to end the hunger strike on May 20th, but the mass still stuck to sit in the Tiananmen Square.

Under such condition, both sides had two options. The students could choose either to carry on the demonstration (C) or to retreat from the square (R). On the other hand,

[8] The Students leaders established "The temporary University Student Union of Beijing" and announced that the focus of the protest has shifted from "relieve" to "pursuit of democracy".

although the martial law was implemented, the party still had opportunity to choose either to use force (F) or not to use ($\bar{F}$).

Here, the primary goal of the students was to urge the party to respond and redeem the demand and the secondary goal was to ensure the safety of them. Their tertiary goal, according to Chai Ling[9], was to gain more public support and sympathy and let the mass realize the brutality of this communist regime, which was likely to be achieved by carrying on the demonstration. For the party, the primary goal was to restore the order of Beijing and the secondary goal is to avoid casualties of the military. Its tertiary goal is to minimize the notorious effect of using force.

According to the preference rank and options, Figure 2 shows the payoffs in all four states:

		The Party	
		Use Force	Not Use Force
The Students	Carry on	<u>2,2</u> [3,4]	4,1 [3,4]
	Retreat	1,3 [3,4]	*3,4* [3,4]

Key: (x,y)=(payoff to the students, payoff to the party)
[x,y]=[payoff to the students, payoff to the party] in AG game[10]
4=best; 3=next best; 2=next worst; 1=worst
Nash equilibrium underscored
NME[11] in italic (3,4)
Dominant strategy shaded

Figure 2

[9] Chai Ling is one of the radical student leaders, who claimed to carry on the protest at any cost; death and casualties were necessary to let the people know the nature of this brutal party. See documentary film *The Gate of Heavenly Peace*. Long Bow Group Inc. 1995

[10] An anticipation game (AG) is described by a payoff matrix, whose entries, given in brackets, are the nonmyopic equilibria into which each state of the original game goes.

[11] In a two-person game, a Nonmyopic equilibrium (NME) is a state from which neither player, anticipating all possible rational moves and countermoves from the initial state, would have an incentive to depart unilaterally because the departure would eventually lead to a wors, or at least not a better, outcome.

C-F: violent confrontation happens. The military uses armed force to suppress the protest, which may cause casualties of both sides. The party will commit retaliation toward the students and keep them in jail. At this state, the students fails to achieve their first two goals, the asking for redemption of their demands and keeping safe, but the possible massacre may help them to reveal the brutality of the party and gain wide support and sympathy. For the party, it successfully ends the protest but causes casualties and leads to notoriety of itself.

C-$\bar{F}$: the party fails to suppress the demonstration and the students still hold stake to demand the party. At this state, the students achieve all their goals but the party only achieves its tertiary one.

R-F: violent crackdown still happens. The students voluntarily retreats but are driven away violently, and will suffer later retaliation from the party, like sentence. The reality is easy to be concealed by the party, leaving no chance for students to rouse the sympathy of the public. They fail to achieve all their goals. On the other side, the party achieves its first two goals but fails in the tertiary one.

R-$\bar{F}$: the demonstration will end peacefully without casualties of both sides. The students still hold future chance to pursue their demands and the party exterminates the protest without any cost. At this state, the students achieve all their goals except the tertiary one and the party tackles all its objectives.

Since the students were still protesting on the square and the military had not yet use force, the status quo of this game is (4,1) C-$\bar{F}$. According to standard game theory, the result of this game is the unique Pareto-inferior Nash equilibrium of (2,2) C-F, which is the product of the students' dominant strategy of "carry on" and the party's best response

of "use force". The reality follows the standard theory. The students carried on protesting until the night of June 3rd when the army began to use force to suppress. On the dawn of June 4th, although there was no large-scale casualty and the students were force to retreat, violent conflicts did happen in the Tiananmen Square. Addition to casualties, the crackdown strengthened the authoritarian regime, leaving no chance for the students to conduct protest and pursue for democracy ever since. For the party, although it successfully repressed the protest and stabilized its political position, its army suffered casualties and the image of the CCP deteriorated both domestically and internationally. The crackdown also weakened the confidence of Chinese people toward the reign of the CCP.

However, it is obviously no winner in this game because the result is a Pareto-inferior state (2,2), compared to the Pareto-superior state (3,4). It seems that the students should stick to the status quo (4,1) that gives them the best payoff and the party will take the precedence and move to (2,2). But based on the Theory of Moves, it is irrational to do so. According to the two-sideness convention[12], although the students prefer to stay at (4,1), recognizing that if the party moves the outcome will be (2,2), it is in both the students' and the party's interest that the students move and induce the Pareto-superior outcome of (3,4).

This Magnanimity[13] outcome of the students betters off both players than the Pareto-inferior Nash equilibrium result. If the students anticipate the outcome (2,2) by carrying on, it is rational for them to choose "retreat", inducing the result to magnanimity outcome

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[12] The two sideness convention describes the conditions under which one player will be magnanimous by moving from a state, even though this move leas to an outcome with a worse payoff for that player.

[13] A player is magnanimous when it moves from its best state to its next-best state.

(3,4). At this state, the demonstration will end peacefully with no casualty, and the students still have father chance to facilitate the democratization of China. Compared to what happened in reality, the state of (2,2), which resulted in later political prosecution and the total rejection of the party to democratic system, the NME (3,4) is undoubtedly better to avoid such consequences, keeping the possibility of carrying on future democratic movements. The CCP, on the other hand, can continue its reform with social stability and even voluntarily commence the process of democratization like what leaders in Taiwan and South Korea did. The tragedy could be avoided and a brighter future of China can be anticipated.

So why did these students stick on carrying on the protest? The direct responsibility is accounted to the students' leaders, who were generated and influenced by the emotional radical mass. It is resulted from the mechanism of populism, which, specifically, means that the emotional majority made the myopic choice. In fact, in the early period of this game, among students' leaders, there were many moderates [14] who accurately acknowledged the preference of the party and were insightfully able to anticipate the Pareto-inferior outcome of (2,2). They suggested to end the protest and to make the compromise with the party, retreating to the campus and establishing democracy first in campus, which means moving to (3,4). But the mass was myopic and emotional, insisting that carrying on the protest is the only way to threat the party to respond their demands. The proposition of the moderates failed to convince the mass and later some radical leaders, who took advantage of the mass's emotion, ousted the moderates. Since then the

[14] Moderates in this stage included Wang Dan, Wu'erkaixi, Wang Youcai, etc. They suggested that the students should retreat from the square and prepare for future protest, because the condition at that time cannot give a good outcome.

protest was under the control of the radicals, which finally led to the violent crackdown of the party.

Conclusion

This article illustrates the process of the Tiananmen Protest in Beijing 1989 by game-theoretic models, using the Theory of Moves. It can be shown that at the first stage of the protest, both players attempted to use their threat powers to induce a better payoff for themselves, but the overwhelming power of the party ensured the effectiveness of its threat power, successfully achieving its best payoff and to some extent mitigate the severe condition. In the second stage, however, the students became myopic under the influence of the emotional mass, resulting the game in a Pareto-inferior state with no actual winner. However, the actual process of the demonstration is far more complicated than the modeled game, which cannot be fully explained in a ten-page paper.

The result, however, shed some lights on the study of 1989 democratic movement and its related organizational construction. In fact, we cannot blame the students to be myopic, emotional and radical, because no student movement throughout the history is in calm and nonmyopic. The radical attitude of student movement is common. In this game, on the end of May, the condition on the square could be say as anarchic: student leaders split into many factions, attempting to establish their own protest organizations and struggle for the power of speech[15]. According to one of the student leaders, Feng Congde, "coups" happened everyday in order to gain power. At last, many moderate leaders lost confidence to the protest, leaving or being ousted from the protest; people who continued

[15] To better mobilizing the mass, what the student leaders of different factions actually fought for was the only broadcaster on the square. See *The Gate of Heavenly Peace*. Long Bow Group Inc. 1995

to stay on the square were mostly radicals. Their myopic strategic choice eventually led to the crackdown. Thus, making nonmyopic decision needs a united organization with effective power of execution and leadership. If the students acknowledged the importance of the unification of leadership, the myopia of the mass could be probably avoided.

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Appendix: Rules of Theory of Moves

1. Play starts at an outcome, called the *initial* state, which is at the intersection of the row and column of a 2*2 payoff matrix.

2. Either player can unilaterally switch its strategy, and thereby change the initial state into a new state in the same row or column as the initial state. The player who switches is called player 1 (P1).

3. Player 2 (P2) can respond by unilaterally switching its strategy, thereby moving the game to a new state.

4. The alternating responses continue until the player (P1 or P2) whose turn it is to move next chooses not to switch its strategy. When this happens, the game terminates in a final state, which is the outcome of the game.

5. A player will not move from an initial state if this move (1) leads to a less preferred final state (i.e., outcome); or (2) returns play to the initial state (i.e., makes the initial state the outcome).

6. Given that players have complete information about each other's preference and act according to the rules of TOM, each takes into account the consequences of the other player's rational choices, as well as its own, in deciding whether to move from the initial state or later, based on backward induction. If it is rational for one player to move and the other player not to move from the initial state, then the player who moves takes precedence: its move overrides the player who stays, so the outcome will be induced by the player who moves.