

A Game Theory Application of the Rational Actor Model to the Russo-Georgian War of August 2008

By Gela Pochkhua*

Introduction

The post-Soviet republics in general, and the Caucasus region in particular, have historically been and still remain within Russia's sphere of interest. Since the collapse of the USSR, the former Soviet republics still feel a tangible influence from their northern neighbor. Despite the fact that official Moscow policy has not changed much, few would have imagined that—in this new century of asymmetric threats—a dominant regional power would feel the need to conduct military campaigns in order to impose its own will in its immediate neighborhood. The generally accepted line of thinking would dictate that economic and social pressure would be sufficient. However, the clashes that took place in 2008 between Russia and Georgia tend to refute this claim, showing that direct military involvement may after all guarantee the implementation of the goals of powerful states, or at least maintain the *status quo ante*, even if they do not fully succeed. Some may see Russia's coercive politics, namely the August 2008 war with Georgia, as an attempt to take its "rightful place" on the geostrategic stage, but the logical question would be if war was a necessary step, and to what extent the decision to go to war was rational for both sides of the conflict.

It is beyond any doubt that Russia is a rising power, demonstrating to the Western democracies (and particularly to the United States) that the world is no longer unipolar. Russia's every effort is directed at regaining political influence over its neighbors and strengthening its position within the international arena. In sharp contrast to its condition during the 1990s, modern Russia is guided by a strong leader; it is under the sway of extremely coercive (but flexible, when necessary) policies; and it is

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gradually moving towards its ultimate goal, the reinforcement and restoration of its traditional spheres of interest. The flip side of the coin is that, in light of its ambitions to regain the status of a global power and a key player in the region, Russia is casually trampling on the interests of other smaller states in the region whenever it deems it necessary, using a variety of tools. For example, among the political tools Russia has deployed to pursue its interests, energy resources are one of the most fundamental. At present, Russia is responsible for a significant share of the delivery of oil and gas delivery to the EU and the CIS itself. The Russian Federation promotes an image as a very trustworthy purveyor, but some incidents involving interruptions in the flow of natural gas in the recent past show a different picture. Another tool of influence is Moscow's provision of support to breakaway regions within Georgia and Moldova, which also contribute to charging the situation around Ukraine. It is a most effective and direct attempt to not only establish control over these sovereign states, but to create positions that can be useful in bargaining and international trade-offs. With respect to Moscow's military tools of "persuasion," the Russo-Georgian war can be seen as an example of coercive, aggressive policy, which will be thoroughly analyzed by many scholars and experts, who are sure to come up with a range of conclusions and inferences in the future. In this regard, the research presented in this article cannot be seen as an intensive and comprehensive. However, my application of the rational actor model to this concrete instance will be hopefully fruitful for those who intend to pursue deeper research into the causes and consequences of the 2008 Russo-Georgian conflict.

The Russo-Georgian War of August 2008

The war that took place in August 2008 between Georgia and Russia was the culmination of a steadily deteriorating relationship between these countries since the disintegration of the Soviet Union. Close observers of the situation around the two main conflict zones in Georgia had been predicting the possibility of full-scale war between Tbilisi and its northern neighbor for some time.¹ A country with a relatively small population and two breakaway regions (Abkhazia and South Ossetia), Georgia was always considered to lie within the sphere of interest of its immediate neighbor. Traditionally backed during the 1990s by support from the Russian Federation, both breakaway regions were subjects of bargaining and negotiation between the big powers in the region. As no solution to these problems materialized, some minor armed incidents took place from time to time.

¹ See Svante E. Cornell and Frederick S. Starr, eds., *The Guns of August 2008: Russia's War in Georgia* (New York: M. E. Sharpe, 2009), 64.

Due to the fact that this conflict has not received much analysis via the rational choice and game theoretical framework, I decided to make a contribution by making a concrete game theory application of the Rational Actor Model (hereafter RAM) to this instance, because the conclusions of such a study may make future research related to this case much more fruitful. This article will examine the events of August 2008 from two perspectives. First, by applying RAM to this specific instance, I define to what extent decisions about going to war made by actors were rational. Second, I identify and answer some questions concerning potential alternative outcomes, based on different possible actions of the players.

Debate

Despite the fact that two years have passed since the conflict, and a significant body of solid facts has been presented by both its contestants and monitors, there is still no unanimous agreement on who started the war and who bears most responsibility for the devastating outcomes on one hand and the received benefits on other. The analysis of this game (the Russo-Georgian War) provides us with interesting information regarding both the theoretical and the practical side of the subject. However, it must not be forgotten that applying game-theoretical models calls for additional vigilance, because it is often very difficult to make pure applications of such models to concrete cases without facing difficulties. My research into this case was not an exception.

While applying the Rational Actor Model to the Russo-Georgian War, it must be assumed that rational actions can be identified as a deliberate, goal-oriented set of actions oriented towards utility maximization.² In other words, rationality is defined as a “particular and very familiar class of procedures for making choices.”³ Pure rational choice theories imply that all actions of individuals can be ranked with a preference order, and that actors should not be uncertain about a choice—that is, they should have “a set of complete and transitive preferences over the set of outcomes.”⁴ If they prefer **A** to **B** and **B** to **C**, then they prefer **A** to **C**. In other words, they should know what will happen in case they choose any of the alternatives. Thus, pure theories of rational choice assume that all alternatives and all consequences of those alternatives are known with certainty, and that all preferences relevant to the choice are also known.⁵

² Steve A. Yetiv, *Explaining Foreign Policy: U.S. Decision-Making and the Persian Gulf War* (Baltimore: The Johns Hopkins University Press, 2004), 30.

³ James March, *A Primer on Decision Making* (New York: The Free Press, 1994), 2.

⁴ James D. Morrow, *Game Theory for Political Scientists* (Princeton, NJ: Princeton University Press, 1994), 18.

⁵ *Ibid.*, 4.

However, in the real world, the assumptions named above are rarely met. For the most part, decision makers do not possess perfect information and, equally important, their problem-solving capacities are very limited; the human mind is incredibly complex, but unfortunately it is not almighty. That is why, according to Herbert Simon, human capabilities for making rational choices are very similar to the paradigm of bounded rationality.⁶ Furthermore, while selectively making a choice between large numbers of possibilities in order to discover what other alternatives are available and what consequences they hold, decision makers do not always pursue utility maximization. Instead, they usually terminate the search as soon as they find a suitable and satisfactory outcome. If so, Simon is right to say that pure rational choice theory will fail to explain actors' behavior if the information on alternatives and consequences is unavailable. Nevertheless, it does not necessarily imply that it is impossible to build a game-theoretical model of RAM in cases where players do not possess complete or perfect information. Thus, to understand the behavior of decision makers, it is crucial to specify what the players of the game want, what they know, and what can they compute.⁷ It is also critical to assume that their preferences are complete, fixed, and transitive.⁸

I share the view that game-theoretical modeling is very attractive because of its advantages over other approaches. It makes strong connections between theory, the model, and the case they are applied to.⁹ In addition, game-theoretical models imply that every player of the game has common knowledge about the rationality of other players—in other words, that everybody knows something, and everybody knows that others also know something. This is a very important and powerful assumption because it helps to understand the structure of the game, the preferences of its actors, and their strategic interaction.¹⁰

Research Design

The work presented in this article has one research question and one hypothesis. My research question is, Did the players of the game (in this case, the Russo-Georgian War of August 2008) make rational decisions? My hypothesis is that the decisions made by the players can be considered as rational.

⁶ Herbert A. Simon, "Human Nature in Politics: The Dialogue of Psychology with Political Science," *The American Political Science Review* 79:2 (June 1985): 294–98.

⁷ *Ibid.*, 295.

⁸ Scott Gates and Brian Humes, eds., *Games, Information and Politics: Applying Game Theoretical Models to Political Science* (Ann Arbor, MI: The University of Michigan Press, 1997), 8.

⁹ *Ibid.*, 5–6.

¹⁰ *Ibid.*, 5–9.

The units of analysis in this research are the actors who made decisions, while the units of observation are decisions themselves.

The games introduced in this essay contain three important stages of model building: conceptualization, operationalization, and interpretation.¹¹ Namely, they include players, their payoffs, and their nodes of decisions, actions, and information sets. One of the games (Figure 3) has a probability distribution for each node. The conceptualization of this particular case involves clarification and simplification.¹² While working on my research, I simplified the reality in order to have a better understanding of the specific aspects related to the game. The models I built are presented in both formal and extensive forms, because the former is commonly used by social scientists, while the latter presents more information regarding the game. Due to the fact that both sides claimed they were responding to each other's actions, retrospectively these game models can be seen as sequential, not simultaneous.

Game Figure 1, which has an extensive form of representation, was introduced to show that the strategies available to the players were dominant, and that there are no differences regarding the preference ordering of the players, regardless which of them was the first to start the game. Game Figure 2 and the subsequent analysis go deep into the roots of the game, addressing not only the questions of rationality but also aspects shedding light on the actors' motivations and goals. Figure 3 and 4 differ from the rest of the models. The former is based on the assumption that players did not possess complete and perfect information, while latter is a zero-sum representation of the Russo-Georgian War based on different goals of the players from those shown in the other figures.

Each of these games is analyzed on the basis of the rationality of the decisions made by the actors, their possible motivations, and perceived benefits. The operationalization level of each game includes a delineation of the strategies that produce equilibrium outcomes. In other words, I defined strategies that offer the solution to each particular game to find out how rational were the players' actions. Finally, I interpreted particular game results to gain a better understanding and explanation of the research question I intended to answer.

¹¹ Ibid., 12–13.

¹² Ibid., 11.

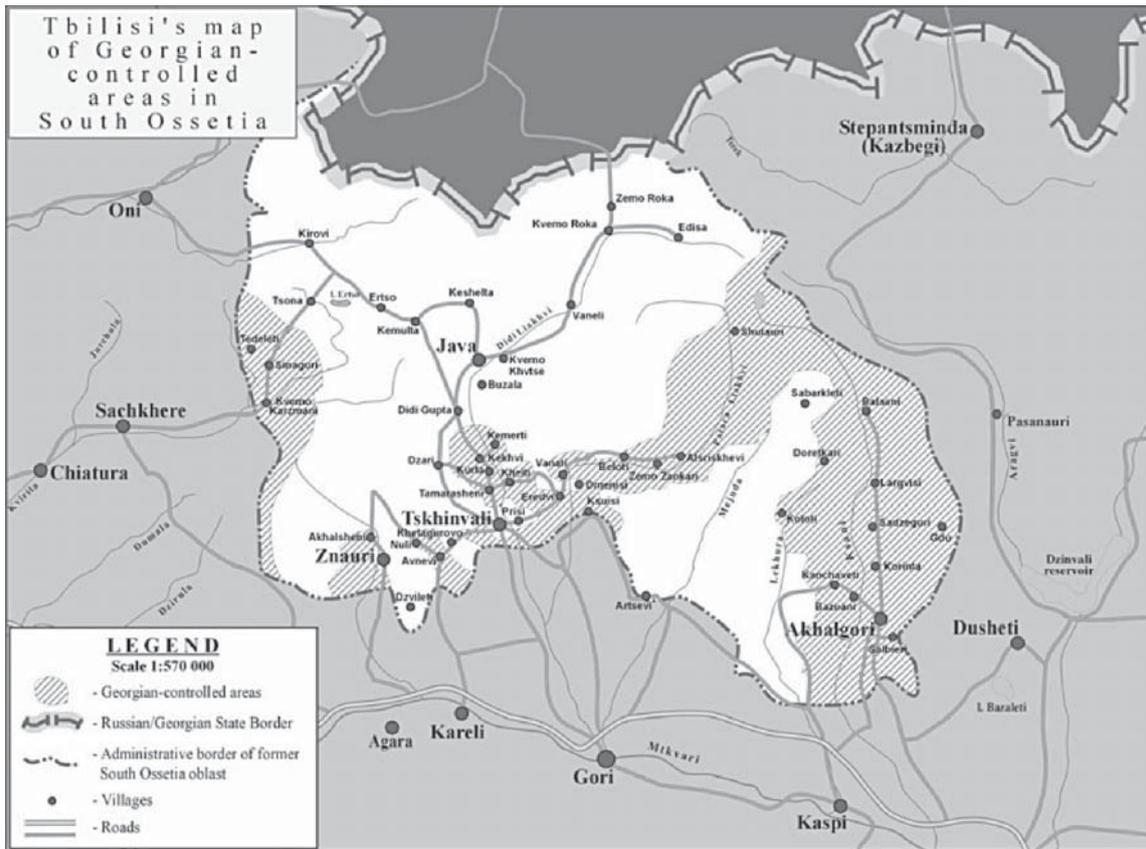
While conducting this research I used a content analysis method while analyzing the data. I analyzed the official documents adopted before, during, and after the conflict, including official investigations and the European Union's Taliagvini Commission's report. Second, I paid attention to magazine and newspaper articles and addressing subjects relevant to the conflict, because they contained valuable information, which was also very helpful. Finally, I collected data from books directly related to the empirical aspects of the case.¹³ In addition, I sampled data from various Internet media outlets, which also provided relevant information.

Representing the Conflict

In order to have a better understanding of this particular game, I will first provide a short chronology of events and a map of the conflict zone.

Map of the Tskhinvali Region (South Ossetia) representing the Georgian controlled areas prior the conflict (Courtesy: University of Texas at Austin, Perry-Castañeda Library Map Collection)

¹³ In particular, I relied on Ronald D. Asmus, *A Little War that Shook the World* (New York: Palgrave Macmillan, 2010) and *Guns of August*, edited by Svante Cornell and S. Frederick Starr. It should be mentioned here that the former is a real treasure trove for researchers working on the Russo-Georgian War, because it contains interesting and fruitful empirical data covering both general questions about this conflict and more specific questions related to behind-the-scenes decision-making processes.



Before the August 2008 war, the Region of Tskhinvali was under the *de facto* control of separatists; this region was populated both by Georgians and Ossetians. Villages were mixed in a chessboard order that actually favored the Georgian side, and were under the official control of the Georgian government in Tbilisi. Tensions rose gradually beginning in late July 2008, when all sides of the conflict (including the press) were spreading messages that the situation within the conflict territories was worsening. On July 28, separatist fighters opened fire on OSCE observers and peacekeepers, moving in the direction of the village of Chorbauli; on July 29, prior to the official outbreak of hostilities, the separatist militants initiated the shelling of villages inhabited by mixed ethnic populations.¹⁴

¹⁴ Parliament of Georgia, *Report of Temporary (Ad Hoc) Parliamentary Commission on Investigation of the Military Aggression and other Actions of the Russian Federation Undertaken Against the Territorial Integrity of Georgia* (Tbilisi: Parliament of Georgia, 7 January 2009); available at http://www.parliament.ge/index.php?lang_id=ENG&sec_id=1315&info_id=22617.

The bombardment rounds used were illegal under international law, because of their large caliber. The same day, the OSCE observers working together with peacekeepers were fired on again.¹⁵ Similar incidents, reported by the OSCE mission in Georgia, took place until August 6, including continuous minor armed clashes, shelling of villages, artillery bombardments, and numerous responses to “hostile fire” reported by both sides.¹⁶ On August 4–5, Tskhinvali was visited by journalists and diplomats, and on August 7 by Temur Yakobashvili, the Georgian Minister of Reintegration, and Yuri Popov, chief Russian negotiator over South Ossetia. While the Georgian minister’s attempt to start a negotiation process failed because of the Ossetian refusal to participate, Mr. Popov was more successful. He managed to contact the *de facto* ruler of the region, Eduard Kokoiti, but failed to convince him to attend a meeting. In a short time, General Marat Kulakhmetov, Commander of the Joint Peacekeeping Forces in the Tskhinvali region, admitted that his peacekeepers could not stop Ossetian combatants from shelling the villages, and advised the Georgian side to declare a unilateral ceasefire, which was announced by Mr. Saakashvili at 19:10.¹⁷ The peace did not last long. According to official reports from Tbilisi, at that time troops of the Russian Federation had already entered the region through the Roki Tunnel.¹⁸ The tunnel is approximately 3600 meters long, and is one of very few routes connecting Georgia and the Russian Federation. Bombardment of the Georgian villages resumed from 20:30, and at around 23:35 the President of Georgia transmitted three orders to the Commander of the Joint Chiefs of Staff: to halt the invasion of the Georgian territory by the regular army of the Russian Federation; to suppress the enemy fire directed against the Georgian villages through the elimination of the weapon emplacements of the adversary in the Tskhinvali region; and ensure the security of the peaceful civilian population of the Tskhinvali region.¹⁹ On the other side, the Russian President gave similar orders to his military command.

¹⁵ Organization for Security and Cooperation in Europe (OSCE), “Spot Report: Firing Incident in Sveri/Andzisi Area in the Georgian-Ossetian Zone of Conflict” (Vienna: Conflict Prevention Center, 2008); available at http://georgiaupdate.gov.ge/en/doc/10010618/Annex%2020_OSCE%20on%20Andzisi%20Firing.pdf.

¹⁶ Parliament of Georgia, *Report of Temporary (Ad Hoc) Parliamentary Commission*.

¹⁷ Office of the State Minister for Reintegration, Republic of Georgia, “On the Eve of War: The Sequence of Events on August 7, 2008,” 2008; available at http://www.smr.gov.ge/uploads/file/On_the_eve_of_war.pdf; OSCE), “Spot Report: Firing Incident in Sveri/Andzisi Area.”

¹⁸ Parliament of Georgia, *Report of Temporary (Ad Hoc) Parliamentary Commission*.

¹⁹ Parliament of Georgia, *Report of Temporary (Ad Hoc) Parliamentary Commission*.

The Russian operation, dubbed “Compulsion to Peace,” implied the use of all means necessary to protect the South Ossetian population from Georgian “aggression” and prevent such attacks in the future.²⁰ As a result, Georgian armed forces were forced out of the region, and more than half of the country was occupied by Russian troops. On August 15, with the active mediation of the French President Nicolas Sarkozy, Presidents Saakashvili and Medvedev signed a ceasefire agreement, containing the following six points:²¹

1. Adopting the regime of non-use of force
2. Halting all military activities
3. Ensuring free access to humanitarian aid in the region
4. Returning Georgian troops to their regular dispositions
5. Returning Russian troops to the lines held prior to the military activity, while empowering Russian peacekeepers with the provision of additional security measures until an international solution is attained
6. Starting international discussions on the preservation of security and stability in both the South Ossetia and Abkhazia regions.

I will stop the chronology of events, because this brief sketch is sufficient to see what preceded the war, what was the scale of escalation during the conflict, and what was its immediate endpoint. Later in the article I pay greater attention to the events that took place in August 2008 and examine the case more thoroughly.

²⁰ Oreanda-Novosti News Agency, “Medvedev Issued the Order about ‘Compelling’ Georgians to Peace,” (9 August 2008); available at <http://www.oreanda.ru/ru/news/20080809/common/events/article322225/>; Heidi Tagliavini, for the Council of the European Union, “Report: Independent International Fact-Finding Mission on the Conflict in Georgia,” vol. 2 (Brussels: Council of the European Union Press, 30 September 2009), 188–89; available at http://www.ceiig.ch/pdf/IIFFMCG_Volume_II.pdf.

²¹ Office of the State Minister for Reintegration, Republic of Georgia, “Russian-Georgian Ceasefire Agreement,” 15–16 August 2008; available at http://www.smr.gov.ge/en/tskhinvali_region/legal_documents/2008_events/6_point_agreement.

Modeling Games

Representation and Analysis of the Game: Figure 1

As mentioned above, this particular conflict (or “game”) took place in August 2008. The exact date of the conflict plays a crucial role in the existing debate among not only the players, but also the rest of the world. Both sides claim that they were responding to each other’s actions. More precisely, Tbilisi states that on August 7 troops of the Russian Army had already entered the region, while Moscow insists that they were given an order to intervene only on August 8. This discrepancy between the actors’ claims appears to be small, but it is actually very important. Nevertheless, there is not significant debate about the state of affairs preceding the entrance of the players into the game: namely, the increased shelling and bombardment with heavy artillery rounds of villages populated by ethnic Georgians and those with mixed populations controlled by the Georgian side.

The first game matrix is built on the assumption that facing the facts on the ground, the Georgian side had to make its move first. Thus, facing the situation described above, the President of Georgia issued three orders:

- To halt the invasion of Georgian territory by the regular army of the Russian Federation
- To suppress enemy fire directed against Georgian villages through the elimination of the weapon emplacements of the adversary in the Tskhinvali region
- To ensure the security of the peaceful civilian population of the Tskhinvali region.

Based on these orders, an assumption can be made about the policy preferences of the official Georgian government in Tbilisi. Namely, it can be said that by deploying troops in the region, Georgia wanted to defend its population by either ensuring the security and safety of its population or providing a secure corridor for their evacuation (as history showed). Of course, had the Russian troops been defeated, or had Moscow ordered them out, then the territorial integrity of the country would have been restored. Hence, the main preference of the Georgian side was to maintain the security of the Georgian-controlled enclaves, along with an auxiliary preference: the possible restoration of territorial integrity.

After the bombardment of Georgian villages increased, the regime in Tbilisi considered two options: either to resist the adversary, or to do nothing. At same time, the Russian side had the choice either to continue backing the Ossetians or stop providing help. It can be assumed that Russia’s interest in backing separatist forces within

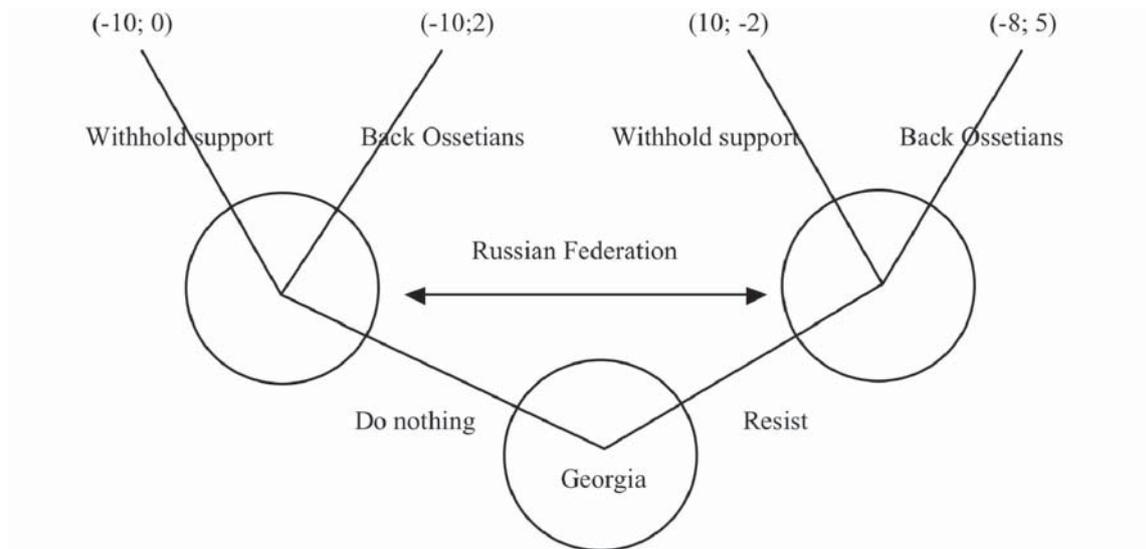
a neighboring country was motivated in no small part by the fact it did not want to set the precedent that territorial problems in its own neighborhood would be allowed to progress without Moscow’s mediation. Its decision to back the separatists was also likely driven by the desire to openly punish a once friendly and now rather problematic neighbor, thus ensuring for itself the status of supreme power in the region. Either way, it appears that Russia could not afford not to intervene, but the question remains as to what the cost of intervening would actually be.

The options available for the players and the outcomes related to their actions are represented in the game tree in Figure 1. Since the facts of the case described above imply that the Ossetians started the heavy bombardment of Georgian villages, and according to the Georgian side the Russian troops were providing assistance to the Ossetian separatists, we can conclude that decision makers on at least one side were in possession of perfect information about their opponent. Hence, we can consider that this particular game (at least for one side) had the element of perfect information.

The first decision node on the game tree belongs to the Georgian side; its strategy decision is either to “Resist” or “Do nothing.” Then, based on the actions of its opponent, the Russian Federation considers its own move. It also has two available strategies, leading to four different outcomes. Each of the four consists of two numbers representing the payoff values. In first two game matrices, I prefer to use absolute payoff values, because they not only represent the preference ordering, but also give a clear understanding to what extent players prefer (for example) outcome A over outcome B. Hence, in order to show a range between the values, the highest payoff for each of the players is 10, while the lowest is -10.

Figure 1: Extensive-Form Representation of the August 2008 Russian-Georgian Game

a) Population oppressed; no additional Russian troops in the region.	b) Population oppressed; additional Russian troops in the region; Russian image diminished.	c) Separatist forces defeated; population security ensured; territorial integrity restored.	d) Georgian forces defeated; population is evacuated; possible diminution of Russia’s image.
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The analysis of Figure 1 shows that the choices available to the players at a given time constitute their strategies. We can also observe the possible outcomes for the players should they have moved in different directions. Finding a solution for the game means finding its equilibrium. Every game can have two types of equilibriums—pure or mixed strategy—but each game must have at least one.²² Based on the given information, I delineate the strategies available to the players in order to find possible solutions. One way to find a solution in the game is to examine each player's best response to the opponent's move.

In this game, Georgia moves first, and has two strategies, against two available to the Russian Federation. Moscow can make its move after Tbilisi decides to deploy or not to deploy troops in the breakaway region. Due to the fact that Georgia wants to avoid losing control over its own enclave, and wants to ensure the security of the Georgian population, the decision to deploy troops in the region is in line with Georgia's preferences. It seems rational if Georgia's goal is to save people by buying some time for evacuation.²³ In fact, it is the only the rational move, even if Tbilisi harbors visions of conquering the region by defeating an adversary like Russia. The "Do nothing" strategy is simply not a realistic choice, for several reasons. First, this strategy would lead to deaths among the population, Georgian peacekeepers, and the police guarding the encircled villages. Second, if they chose to do nothing, government officials could hardly avoid damage to their image, even if they implied the impossibility of winning a conflict against a much stronger neighbor.

²² Gates and Humes, *Games, Information and Politics*, 30

²³ Asmus, *A Little War that Shook the World*, 189.

Choosing this strategy would lead to very unpleasant political consequences. Thus, knowing this, Georgia is more likely to choose the strategy “Resist” rather than the strategy “Do nothing.”

At this point, it is necessary to mention that four years before the current conflict Georgia chose to defend its population under very similar circumstances. On 19 August 2004, Georgian forces managed to capture a strategic hill that was used to shell Georgian villages, pulling its forces out after the mission was over.²⁴ Considering this, it was even more tempting for Tbilisi to choose the “Resist” strategy. It is obvious that, should Russia openly intervene, defeat for Georgia would be the most likely outcome, but at least the population would be saved, and the regime’s political opponents would not be able to accuse the government of adopting the “Do nothing” policy. Thus, it is most likely that objective “minimum” would be accomplished. At the same time, if Russia decides to stop providing support to Ossetians, then Georgia most probably will not only suppress the shelling, but also will defeat all separatist forces and restore its territorial integrity. If this scenario happens, it will be beneficial for the Georgian government not only strategically but also politically.

Thus, it can be argued that in this game Georgia has a strong dominant strategy: “Resist.” If so, what strategies are available to Russia? Officially, its objective is to repel the Georgian attack and save the lives of South Ossetians, but according to Asmus, the most obvious goal for Russia is “at minimum to consolidate Abkhaz and South Ossetian independence—most likely as a prelude for their eventual annexation.”²⁵ In either case, the achievement of each goal requires action. Moscow has two available strategies: “Withhold support” from the Ossetians or “Back Ossetians.” The “Withhold support” strategy is not beneficial for Moscow, because decision makers in Moscow know that unless the Russian Federation continues to assist its allies they will be defeated, and control over the breakaway region will be lost. Hence, Russia’s most optimal strategy is to continue supporting the Ossetians, which will lead to the defeat of the Georgian troops, preventing Tbilisi from reasserting control over the region, and also to the banishment of the Georgian population. Thus, based on the correspondence of best results, it can be assumed that Russia also has a pure dominant strategy in this game: “Back Ossetians.” It is also the dominant strategy because the decision makers in Moscow do not know whether Tbilisi will stop its military action after suppressing the hostile fire or whether it will try to regain the lost province. If so, this game has the following solution: {R (B)}. It is the equilibrium solution because, based on their goals, both players have dominant strategies, and both are rational because they strive for utility maximization. In addition, it seems that neither player has any incentive to change their strategy unilaterally.

²⁴ Civil Georgia, “Georgia Gives ‘The Last Chance for Peace’ in South Ossetia,” *civil.ge* (19 August 2004); available at <http://www.civil.ge/eng/article.php?id=7658>.

²⁵ Asmus, *A Little War that Shook the World*, 169.

One more interesting issue to be analyzed is related to the question of whether the Russian Federation will take into consideration or neglect the Ossetians' wishes. Theoretically, taking into consideration the Ossetians' desires implies a tit-for-tat strategy, which means that Moscow would provide help in cases of fruitful previous cooperation between the sides, and would restrain in cases where the opposite conditions exist. However, at least two problems arise here. First, Figure 1 does not represent the involvement of Ossetia as a player. It is simply assumed that the Ossetians participate in the game as part of the original facts on the ground. If so, there is no information showing Russian-Ossetian cooperation. Second, the tit-for-tat strategy calls into question the existence of Moscow's dominant strategy in this game. After all, it is hardly possible that the Russian side will endanger its preferences by building its own strategy based on previous cooperation with the Ossetians. Russia most probably would have entered the region had Georgia chosen the "Do nothing" option, or even had the Ossetians been able to defeat the Georgian troops on their own. Thus, regardless of how fruitful the previous cooperation with the *de facto* Tskhinvali regime was, Russia has two choices: to back the Ossetians regardless of their wishes, or to choose the "Do nothing" strategy.

Analysis of Figure 1 reveals that the outcomes and preference ordering of the players does not change no matter who starts the game, leading to the assumption that both Moscow and Tbilisi had dominant strategies in reality. To better understand why those strategies were dominant, and what the motivations of the players in August 2008 were, I built Figure 2. Again, it should be mentioned that, while on the verge of making a critically important decision, the Georgian president should have kept in mind at least three important issues: the safety of Georgian citizens living in the region controlled by hostile forces; the safety of the pro-Georgian Ossetian government led by Dimitry Sanakoev; and the historical analogy with events that took place in 2004. In addition, the main question that needs to be clarified is how large was Russia's invading force, because at the time Mikheil Saakashvili had intelligence reports that at least some units of Northern Caucasus volunteers and elements of the Russian Army had already entered the region on 6 August and 7 August, respectively. Thus, facing these consequences, and in light of the information provided by the intelligence service, the President of Georgia entered the game, or what afterwards would be called "a little war that shook the world."²⁶ Like the previous game discussed in this essay, the next one is not simultaneous but sequential. This means that players are operating within a given set of facts, and their moves are dependent on the possible moves of their opponent. Figure 2 is an extensive representation form of this game, which contains the strategies, payoffs, and outcomes available to the players.

²⁶ Ibid., 215.

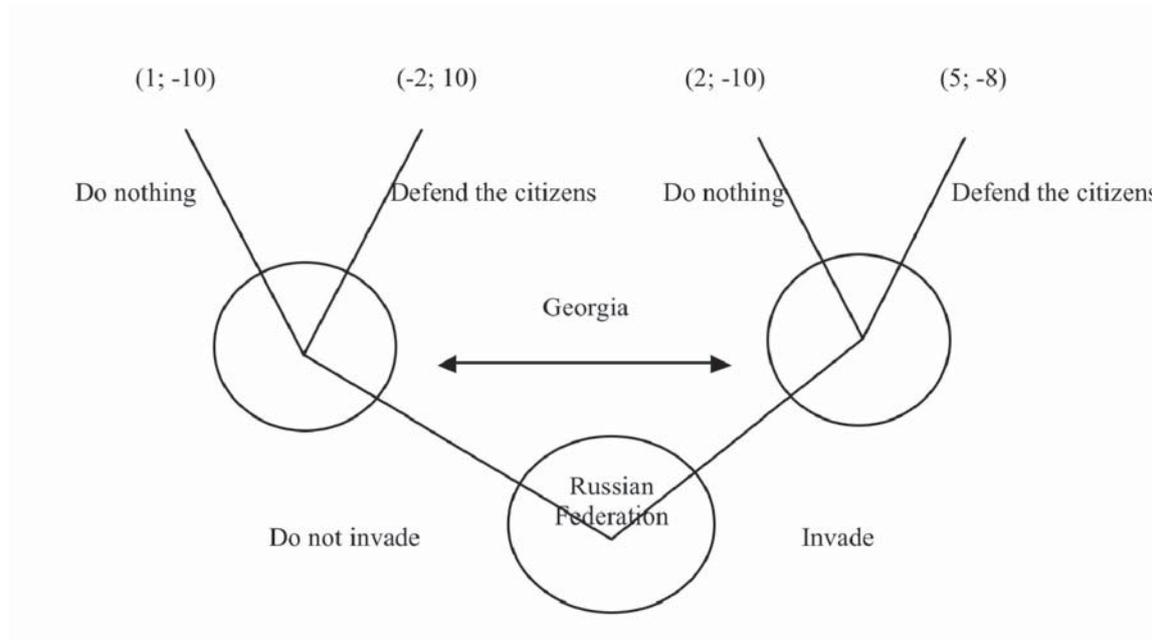
Representation and Analysis of the Game: Figure 2

The given facts in this particular game are the same as shown in the previous section. Namely, the Ossetian combatants are shelling Georgian-controlled enclaves more intensively, using larger-caliber ordnance. The difference here is constituted in the fact that, unlike in the previous game, here the Russian Federation takes the first step, to which Georgia then responds. What about the information the players possess about each other? Clearly, both realize and are aware about things taking place on the ground. Simply put, the Georgian side knows perfectly well that villages under its control are being continuously shelled, and so does the Russian Federation. While the former should have received all of its information from the bombed enclaves themselves, the latter should have known about the situation on the ground from the Commander of the Joint Peacekeeping Forces in the Tskhinvali region, General Marat Kulakhmetov, who admitted at the time that his forces could not stop the Ossetian separatists from shelling Georgian villages. Hence, the parties should have known what was going on, and should have been aware of who their adversary was. If so, they possessed complete information. However, does it necessarily imply that they were also aware of each other's goals and available strategies to achieve these goals? This is not an easy question to answer, because even now it is a subject of debate between officials and scholars. The reason for this uncertainty is rather simple: if we knew this kind of information, we could name the side responsible for the five-day war with a high level of confidence.

I already mentioned that it is quite difficult to argue whether the actors had perfect information about each other or not; thus, I chose to analyze both possibilities. Building this particular game (Figure 2), I assumed that both players had complete and perfect information. In other words, I assume that the Georgian side knew what strategies were available to the Russian Federation and what its goals were, and vice versa.

Figure 2: Extensive-Form Representation of the August 2008 Russian-Georgian Game

a) Population is oppressed; however no Russian Troops entered the region	b) Separatist forces defeated; population security ensured; Possible restoration of the Territorial integrity	c) Population oppressed; additional Russian troops in the region; Russian image decreased.	d) Georgian forces defeated; population is evacuated; possible decrease of Russia's image.
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The analysis of this game starts with an emphasis on how many and what kinds of strategies were available to the actors. Figure 2 shows that the Russian Federation starts the game, and has two available options: Either refrain from doing anything, or invade the region. Obviously, decision makers in Moscow should have worked out other strategies as well; however, those two were most salient at the time. It is important to consider the fact that the so-called theatre of operations was so small that it was hardly possible to maintain the status quo for a long period of time. Clearly, the Ossetian forces would have been destroyed in a matter of two or three days. Hence,

strategies based on long-term effects should have been unacceptable to Moscow. Diplomatic efforts vis-à-vis the West might have given the Georgian side enough time to crush the separatists, while options like a blockade were considered as futile, largely due to geographic reasons. Therefore, if the goals of the Russian Federation—which had been supporting separatist regimes for quite some time—included preventing the fall of their allies under any circumstances, implementing strategies oriented towards diplomatic solutions or blockades were unacceptable. Decision makers in Moscow should have known that they had to come up with strategies that would allow them to achieve the maximum benefits in the shortest period of time. Hence, the “Invade” or “Do nothing” options were the most salient.

One can argue that another strategy would have been to conduct surgical strikes in order to disable certain Georgian strategic objects, but this approach would probably have caused serious diplomatic fallout, which would have been unwelcome in Russia. The problem with the “surgical strike” option is that the targets to be destroyed would need to be very well defined. With regard to this pre-emptive measure, the question would have arisen of what targets should be bombed: targets outside or inside the Tskhinvali region, or maybe both? Had the “surgical strikes” strategy been used to neutralize targets outside the disputed region, the diplomatic consequences might have been very severe, raising at minimum questions about the disproportionate use of force. The West might have not accepted Russian support for a separatist movement in a neighboring country, but in the end it had little power to deny Georgia’s right to defend its own citizens’ lives on its own *de jure* controlled territory. Besides, it was obvious that small surgical strikes could hardly stop the Georgian forces had they decided to advance into the region.

Could Russia have actually bombed or threatened to bomb capital of Georgia itself in order to halt the Georgian forces’ response to the separatist shelling? That is another question that is still a subject of debate. However, in the “Chronicles of August,” a documentary done by journalists at Alania TV, it is argued that a message that the capital was to be bombed was transmitted to the Georgian government by some friendly nations.²⁷ With respect to the option of conducting surgical strikes solely within the Tskhinvali region, they no doubt could have made more sense. Such strikes could have temporarily halted the advance of Georgian troops, but again not without some cost. As was mentioned above, the region is small, with many ethnically-mixed villages, and unmixed villages arranged in a so-called chessboard order. Therefore, conducting only air strikes without also carrying out a ground offensive operation would not have been very fruitful, leading to significant deaths among both the Georgian and Ossetian populations. I am not an expert on military tactics, and this work is not intended to analyze those decisions in great detail. But my own research, as well

²⁷ *Alania TV*, “The Chronicles of Georgian August,” Part 3(6); available on YouTube, at <http://www.youtube.com/watch?v=xOP8KDNwHv8&feature=related>.

as the secondary literature, leads me to conclude that in the context of this particular game (Figure 2), the “Surgical strike” strategy would not have been among those viewed as preferable by decision makers in Moscow. As history showed later, both the region and the rest of the Georgia were bombed by Russian military forces, but as part of a ground offensive operation.

Knowing what strategic options were available to the Russian Federation, the Georgian side should have also come up with its own courses of action. Decision makers in Tbilisi knew that they should have made their move based on the steps taken by the Russian Federation. Hence, they should have worked out their strategies taking into account Russia’s two possible moves: “Invade” or “Do nothing.” Based on the available information, Georgia would have had two possible strategies. Namely, it could have engaged the enemy, or it could have acquiesced should the Russian Federation have entered the region. The question is if there were other possible strategies available to the Georgian side other than those named above. The most salient might have been a diplomatic solution—the choice that would have been so strongly preferred by the West and, as history showed, so useless for the Georgians. But the diplomatic solution is actually incorporated in the “Do nothing” option available to Tbilisi, because doing nothing would have implied only doing nothing militarily—that is, it would not have precluded Georgia from being very active diplomatically, using all available levers and networks.

Aside from the diplomacy option, I should also raise the “Suppressing fire” option, since the “Blockade” option simply did not meet the needs of the Georgian side. The “Suppressing fire” option should have been the only alternative strategy available to Georgia other than deciding to defend or not defend its citizens in the region. The reason why I think it was not considered by Georgian decision makers is that, despite its efficiency, it would have resulted in high casualties among the civilian population, which would have clearly run counter to Georgia’s policy to win the “hearts and minds” of the Ossetians. Actually, this also was one of the reasons why Georgian forces were instructed not to fire against Russian peacekeepers unless they were fired upon first.²⁸ Thus, in this game (Figure 2), there are two strategies available to the Russian Federation and two available to Georgia. What about their potential outcomes?

The best outcome for the Russian Federation comes when it conducts an invasion, and Georgian authorities decide to fight in response. The payoff for this option is represented by a numerical value of 5. It is the best desired outcome for Russia because, aside from the main goals of having a stronger military presence in the region and achieving a more ethnically homogeneous population (which would mean fewer less problems in the future), it also implies the defeat of the Georgian armed forces, which

²⁸ Asmus, *A Little War that Shook the World*, 43.

would likely create instability in the country, possibly leading to regime change. The difficulty here is to introduce enough evidence and significant arguments to justify the invasion of a sovereign state.

The next best outcome for the Russian Federation is when it decides to enter the region and the opponent acquiesces to the move. This payoff has a numerical value of **2**. The reason why this option is the second best is that it still insures the achievement of some preferred goals, but not all. For instance, Moscow again achieves a stronger military presence and a more homogeneous population in the Tskhinvali region, but the Saakashvili government would be able to survive with support provided by the Western democracies. Of course, this kind of action comes with a price affecting the prestige of the country, but by maintaining a peacekeeping mission in place after the conflict it would not be difficult to argue that it was being done solely for reasons of restoring stability. This option is Moscow's next preferred choice because it is connected to the issue of recognition of the two breakaway regions. It is much easier to recognize separatist provinces of a neighboring country as independent states when appealing to the need to defend the lives of one's own citizens; it is significantly more difficult if the separatists themselves are provoking the escalation, with no response from the opponent. However, the main criticism of this claim would be that Russia's movement toward recognizing the independence of the two breakaway regions was already underway prior to the war, and would have resulted in a positive decision in the end despite 2008 drama. On 13 and 21 March 2008, the Russian Duma discussed and adopted a special resolution that essentially declared support for the independence of the *de facto* regimes in Sokhumi and Tskhinvali.²⁹ If so, it would have meant no difference for the Russian Federation had the Georgian side decided to enter the region or not—the strategy “Invade” was still strongly dominant.

The next preferred outcome from the Russian side perspective a numerical value of **1**. It is related to the opposite strategy from invasion, and is conditional. It is achievable if and only if Moscow chooses the “Do not invade” option and so does Tbilisi afterwards. So what would happen if the players choose these strategies, and why does it still give some benefits to the Russian side? Under such circumstances, Moscow has to rely solely on the military capabilities of the separatist forces and the so-called North Caucasian volunteers. Obviously, even without the help provided by the volunteers, the Ossetian separatist forces armed by the Russian Federation could eventually overrun the small garrisons of Georgian police and peacekeepers protecting the Georgian enclaves (500 hundred men in total).³⁰ The main positive outcome for Moscow is that the Georgian enclaves will be destroyed without being involved direct Russian involvement; as actual events showed, those forces did participate in

²⁹ Ibid., 108.

³⁰ Ibid., 146.

the ethnic cleansing of Georgian villages and carried out raids against towns outside the conflict zone.³¹

This strategy would produce benefits in the short term, but would not prove very fruitful in the long term. Decision makers in Moscow should realize that, after the dust of battle is settled, they would be blamed for failing to ensure peace in the region and for letting Ossetian combatants kill innocent people because of their ethnicity. The Russian Federation was supposed to be acting as a mediator in the Georgian-Ossetian conflict, despite the fact that its soldiers were operating under the mandate of OSCE. Hence, such a decision could have potentially shaken Russian domination in the region by introducing other peacekeeping forces as mediators in the ongoing conflict. Had it come to pass, the presence of an EU mission would have been probably acceptable to Moscow, but had it turned out to be a peacekeeping force operating under the NATO umbrella, it would have been clearly regarded as a loss and diplomatic disaster. The irony of the fate for the Georgians is that, had events followed this scenario, they would have clearly lost in the short run because of the deaths of innocent Georgian civilians, but the state could have benefited in the long run if a peacekeeping mission would have been put in place after the conflict. But, as history showed, Georgian decision makers were unwilling to sacrifice the lives of their peacekeepers, police, and at least some part of the population in return for a possible resolution of the conflict in the future.

The last potential outcome for the Russian side has a numerical value of -2, and is clearly the worst option. It would be achieved if Moscow chooses the “Do not invade” strategy and if Tbilisi afterwards opted for the “Defend the citizens” option. This is the worst possible outcome for the Russian Federation for several reasons. In this case, Georgia would crush the separatist forces in a matter of days, even if the North Caucasus volunteers came to the Ossetians’ aid. The *de facto* Tskhinvali regime will crumble, which will be a signal to Abkhazia that it is high time to begin productive negotiations around the future status of its own breakaway region, because it would look like Moscow was willing to simply let it happen by not intervening. Moreover, it will again underline Russia’s incompetence in dealing with peacekeeping missions, and especially one that is ongoing within its immediate neighborhood. Without the frozen conflict in the region, the regime in Moscow would be seen as a big power that is willing to surrender its interests very easily. For instance, after the Russo-Georgian War was over, President Medvedev introduced several arguments explaining why the Russian Federation recognized Georgia’s breakaway regions. Among those reasons, one was relatively new: Medvedev admitted that, like other states, Russia also had “privileged interests” in regions where countries friendly to Moscow are located.³²

³¹ See Cornell and Starr, eds., *The Guns of August 2008*, 176.

³² Asmus, *A Little War that Shook the World*, 211.

If granting independence to entities like Abkhazia and South Ossetia means taking steps toward the restoration of the traditional spheres of interest as one of Moscow's goals, its implementation must not be questioned. Thus, it would be pointless to choose the "Do not invade" option, even if the intelligence service had predicted with a significant level of confidence that Georgia was not going to enter the war. Hence, decision makers in Moscow should have known that the stakes were very high, and that the "Do not invade" strategy was not a feasible option.

What are the potential outcomes for Georgia in this particular game? According to Figure 2, Tbilisi has two possible strategies, depending on the opponent's move, and therefore four possible outcomes. In this game, Georgia has only one best possible payoff, and three bad ones, of essentially equal value. The best possible outcome is assigned a numerical value of **10**, and is conditional. It is achievable if and only if the Russian Federation decides not to continue backing the Tskhinvali forces militarily, after which Georgia will enter the game facing only separatist forces and volunteers. Had this scenario come to pass, Georgia's armed forces would have been able to protect its citizens by crushing the separatists and probably restoring the state's territorial integrity in a matter of days. It might have happened had the West provided all available diplomatic assistance to the Georgian side, or if Tbilisi had something to offer Moscow in return. In either case, with one problem solved, Georgia would have been able to devote most of its energy and resources to the other breakaway region.

The first bad outcome for Georgia has a numerical value of **-8**, and it occurs if the Russian Federation opts to "Invade" and Georgia chooses the "Defend the citizens" strategy. The question that arises here is why decision makers in Tbilisi would have considered that option at all, because obviously it was not possible to defeat an adversary like the Russian Federation. The answer to this question should be sought in the situation the Saakashvili government was facing on 7 August and the goals it had defined. The goals of the Georgian side can be evaluated by analyzing President Saakashvili's order issued later that day: stop the invasion by the Russian Federation's military forces, suppress enemy fire towards the Georgian villages by eliminating the adversary's firing positions in the region, and ensure the security of the noncombatant civilian population. In order to have a better understanding of why the Georgian president issued those orders, they need to be better specified. The interesting issue regarding the orders is their chronology. Note that the order to stop the invasion came first, followed by the order sanctioning the elimination of the adversary's positions that were shelling Georgian villages. The third order is a matter for separate discussion, and is analyzed later. So, why would President Saakashvili—who had to ensure the security of the Georgian population in the Tskhinvali region—have placed first priority on halting the Russian invasion?

In the national security meeting held in the Tserovani presidential residence on 7 August 2008, the Minister of Interior Affairs, Vano Merabishvili, introduced an in-

telligence report indicating that the Russian military had taken control over the Roki Tunnel and started entering the region. According to intercepted data, the tunnel was full. At least 150 pieces of armor had entered the region, as well as the 693rd and 135th Regiments of the 19th Division of the Russian 58th Army. The number of hostiles in the region was considered by the Georgian side to be no less than a battalion.³³ In contrast, Moscow declared that its military forces had entered the Tskhinvali region only on the afternoon of 8 August; however, this claim is questionable. For example, Andrei Ilarionov, a former chief economic advisor to Vladimir Putin, stated that by 7 August at least 1200 Russian soldiers were already stationed in the Tskhinvali region.³⁴ Those claims are part of the larger debate on the subject of who started the war, and will probably not be clarified anytime soon.

Returning to the evening of 7 August, President Saakashvili had information that Georgian villages were being shelled, and that the bombardment was far more intense than had previously been the case, resulting in casualties among civilians and peacekeepers. Things got even more complicated when he received intelligence reports indicating that Russian forces had started entering the region. At minimum, this would have meant that the separatists' positions would be strengthened, and at maximum that the Russian military was launching an assault to take Tbilisi.³⁵ In my opinion, Georgian officials believed the latter and, of course, they had to take measures to ensure the security of Georgian civilians. Thus, it can be argued that by issuing the order to halt the Russian invasion first, President Saakashvili was confident that changing the regime in its neighboring country was Moscow's primary goal. In this case, for the decision makers in Tbilisi it would have been irrational to sit and wait until enough enemy forces had entered the region to overthrow the Georgian government. But apparently they wanted to avoid a direct confrontation with the Russian Federation at the same time, instructing Georgian forces not to fire upon the Russian peacekeepers unless they were fired upon first. However, this strategy does not decrease but instead increases the uncertainty related to the game. The paradox is that, by giving orders to attack the Russian military forces that had entered the region, and at the same time forbidding its forces from attacking the Russian peacekeepers unless attacked first, Georgian decision makers rendered their forces on the ground more vulnerable. So, why risk a death of a single Russian peacekeeper if it can afterwards be used to justify the invasion? Two things can be said about this paradox. The first is the paramount importance placed on defending Georgian civilians, police, peacekeepers, and the Sanakoev administration. The second relates to the issue of intelligence failure. The protection of own citizens can be seen as a "Sword of Damocles" for Tbilisi, and is analyzed below, while intelligence failure is related to the notion of uncertainty, and

³³ Ibid., 20.

³⁴ In Cornell and Starr, eds., *The Guns of August 2008*, 74.

³⁵ Asmus, *A Little War that Shook the World*, 49.

the personal traits of a decision maker. It is explored later with relation to Figure 3, which is based on the assumption that players in the Russo-Georgian War did not have perfect information.

The second order issued by the President of Georgia was the elimination of positions from which Ossetian separatist forces were shelling Georgian villages. As was already mentioned, this bombardment of the civilian population was much more severe than previous cases, and President Saakashvili was informed about casualties among both civilians and Georgian forces. He ordered troops to enter the region knowing that some Russian military elements had crossed the border at least twice during the day. What course of action was more rational to Tbilisi at the moment: do nothing in a face of much stronger adversary, calling for help from the West and the United States, or defend the population but guarantee the eventual loss of the war from the moment of issuing that order? The point is that, in light of significant casualties among the civilian population and the Georgian forces defending those civilians on the ground, the “Do nothing” option would have led to negative political consequences. But resisting the invasion would have also carried serious negative implications, when the Georgian forces would have inevitably been crushed by the Russian military machine. The only thing that makes this move rational is the emphasis placed on saving the lives of the oppressed population, the Sanakoev administration, peacekeepers and police. Sadly for the Georgians (and very much according to the Ossetians’ desires), events showed that approximately 25,000 people had to leave their homes during the conflict and are still unable to return; however, their lives were saved. Considering the fact that preserving the security of these citizens was one of the main orders given by President Saakashvili, the order focusing on the elimination of the artillery positions shelling the villages can be considered to be rational and logical. It is a question of territory versus the lives of civilians, and it is rational to choose to save lives of 25,000 people at the expense of losing the disputed territory. Had Saakashvili ordered the opposite, he would have been accused by his own people of acting improperly—and therefore, irrationally.

The third order issued by the Georgian president was to ensure the security of the noncombatant civilian population. Can it be said that Saakashvili implied both the Ossetian and Georgian populations in this order? I think it can. He could have hardly meant that the military was to defend only those people who were standing between his forces and the shelled Georgian enclaves, or even worse, that they should defend only ethnic Georgians. The president meant the entire population of the region. Some can say that this is simply natural, that no democratic government engaged in a similar conflict would make distinctions based on ethnicity, but some may say otherwise. Perhaps Tbilisi hoped that the tide of the battle would shift in their favor? Or that the West might intervene, letting the Georgians enjoy a new, more favorable *status quo*? Or perhaps there was hope the Russians would have chosen the “Do nothing”

option? These questions cannot be answered yet, but if they contain even a small seed of truth, then it is understandable why the President of Georgia ordered his military forces to reach the shelled villages and evacuate the people on one hand, and wanted to ensure the security of the entire peaceful civilian population of the Tskhinvali region on the other.

The remaining outcomes for the Georgian side are equally bad, and are assigned same numerical values of **-10**. Both are associated with the “Do nothing” strategy: the only difference is that in one case Tbilisi prefers not to enter the conflict if the same is done by Moscow, who makes the first move; in the other, it acquiesces after the Kremlin decides to invade. The questions here are why those outcomes can have the same values, and why the “Do nothing” option is not beneficial to Georgia. The answer to these questions lies in the goals of the government in Tbilisi. Orders issued by Saakashvili underline that his main concern was to save the lives of people living in the enclaves by providing protection and forming a corridor for their evacuation in case attempts to halt the military threat to the region proved futile.

There were two main reasons why the “Do nothing” option was regarded as unacceptable to the Georgian side. First, it would have caused a political fiasco for the president and his regime, because it would have not been tolerated by the Georgian people, and especially not by the political opposition in Georgia, which at the time was constantly urging citizens into the streets to demand a change in government. Second, Georgian enclaves in South Ossetia were key to any successful resolution of the conflict, because they played an essential role in Tbilisi’s policy to win “hearts and minds” in the region. The Georgian government was spending significant resources to make alignment with Tbilisi look more attractive to the Ossetians, and to illustrate the differences between life under the *de facto* Kokoit regime and the *de jure* Sanakoev administration. Saakashvili also hoped to underline that his government was eager to solve the conflict by political, not military means.³⁶ With help provided by Tbilisi, Dimitri Sanakoev became the *de jure* president of South Ossetia. An ethnic Ossetian and an enemy of Tbilisi in the past, he now was representing the interests of enclaves largely populated by Georgians, or of villages made up of mixed Ossetian and Georgian populations—those civilians that Saakashvili wanted to defend. Thus, by losing those enclaves, Tbilisi was losing hope of successfully resolving the conflict. Decision makers in Tbilisi were aware of the reasons and dangers stated above, and thus should have considered “Do nothing” strategy to be a non-starter. If so, it would have made little difference for the Tbilisi to choose the “Do nothing” option whether Moscow decided to invade or not.

³⁶ Heidi Tagliavini, for the Council of the European Union, “Report: Independent International Fact-Finding Mission on the Conflict in Georgia,” vol. 2 (Brussels: Council of the European Union Press, 30 September 2009), 15; available at http://www.ceiig.ch/pdf/IIFFMCG_Volume_II.pdf.

Thus far, I have introduced the strategies and outcomes available to the players. In order to find a solution to the game represented in Figure 2, I use a method of backward induction, conducting an analysis of the game by moving from the strategy of the last player to the one that started the game.³⁷ Based on the facts discussed above, it becomes obvious that Georgia will choose the option to defend its citizens. Knowing this, the Russian Federation cannot allow the separatist forces to face the Georgian troops on their own, and therefore will choose the “Invade” option. Hence, strategy {I; D} is the equilibrium solution of this particular game, which is sequential and is based on perfect information. Two questions arise here. First, can it be a Nash equilibrium? And second, does this game have a subgame perfect equilibrium? It might be a Nash equilibrium in case both players do not have incentives to unilaterally change their strategies, because in this case they would become even worse off. The Russian Federation is the first one to move in this game. Knowing that Georgia will order its troops to enter the region, Moscow does not have any incentive not to invade, and therefore has a dominant strategy in this game. What about Georgia? It makes its move after Russia. Decision makers in Tbilisi already know that Russian military forces have entered the region, and as stated above will still choose to defend their population. If so, the players do not have incentives to unilaterally change their strategies, and hence {I; (D; Dn)} is a Nash equilibrium in this particular game. Is it subgame perfect? It will be subgame perfect in case strategy D (defend the citizens) is a perfect equilibrium strategy, no matter what moves will be made by the Russian Federation. And apparently the “Defend the citizens” option is the best rational strategy for Tbilisi, because it either results in an outcome of **10** if Russia does not invade, or an outcome of **-8** if Russia decides to cross the border. Hence, it can be concluded that Figure 2, which is sequential and is based on the assumption that the players possess perfect information, has one pure equilibrium solution—{I; (D; Dn)}, which is a Nash equilibrium—and it is subgame perfect.

The last question regarding Figure 2 is whether it contains more than one equilibrium solution. Since an equilibrium strategy can be considered a rational strategy for players, it should be connected to their payoffs. The Russian Federation has three positive payoffs (**1**, **2**, and **5**), while Georgia has only one (**10**), and their strategies are strictly dominant. Both nations will choose the option of intervention, regardless of the steps taken by the other. However, in case either of them has a weakly dominant strategy, more equilibrium solutions might be seen in this game too. What if the Russian Federation knows in advance that Georgia is not going to intervene under any circumstances, because it is afraid to be called an aggressor?

³⁷ Gates and Humes, eds., *Games, Information and Politics*, 41.

Moscow will choose the strategy “Do not invade”; so will Georgia, and the outcome will result in an exodus of the Georgian population, strengthening Russia’s control over the region. This strategy can be represented in the following way: $\{D_n; D_n\}$. It can be an equilibrium strategy if by choosing the “Do nothing” option Georgia acts rationally. For example, if decision makers in Tbilisi want to show that their country is not an aggressor, that the Russian Federation fails to fulfill its own duties as a mediator, that its peacekeepers cannot stop Ossetian combatants from slaughtering Georgian population, and that therefore the negotiations format should be changed. Another possible equilibrium situation can emerge if Georgia chooses the “Do nothing” option and Russia, knowing that it will be blamed for failure in its peacekeeping mission, will decide to enter the region regardless of Tbilisi’s actions. In this case, the equilibrium strategy will be $\{I; D_n\}$.

Nevertheless, these two possible equilibrium strategies can hardly be Nash equilibriums, since players of this game may have some incentives to unilaterally change their courses of action. The clearest example of this claim can be one showing Georgia changing its own strategy from “Do nothing” to that of defending the population after a “Do not invade” decision is made by the Russian Federation. Hence, $\{D_n; (D_n; D)\}$ may be an equilibrium solution for this game, but it cannot be subgame perfect. As regards another possible solution, $\{I; (D_n; D)\}$, it can emerge as a Nash equilibrium only under certain conditions. For instance, if Georgia will decide that it is worth sacrificing the lives of at least some part of its own population to be better off in the long run by excluding Russia’s peacekeeping presence from Georgian territory. If this were Georgia’s real goal, then $\{I; (D_n; D)\}$ can be a Nash equilibrium. In case Tbilisi’s strategy is weakly dominant, then it may be still an equilibrium, but it cannot be subgame perfect, because Georgia may have an incentive to unilaterally switch from one strategy to another.

So far, I have introduced an extensive analysis of games built on the assumption that the players knew what type of an opponent they were facing, they were aware of the strategies available to each other, and of the potential outcomes of those strategies. In other words, I applied game theory to a concrete instance, assuming that both Russia and Georgia had complete and perfect information. However, in reality it is hardly possible to find an empirical case where one side is aware of an opponent’s preference ordering and its outcomes and vice versa. Below, I analyze the Russo-Georgian War from the perspective that the players of this game did *not* possess perfect information, though they knew that they were facing each other. The information available to the players is represented in Figure 3. Please note that this time the outcomes for the players are not represented in solid numerical values, and are only assigned letters. Because of the uncertainty that has been introduced, Figure 3 is slightly different than the previous matrices.

Representation and Analysis of the Game: Figure 3

The game of incomplete information implies that it contains an element of uncertainty.³⁸ The assumed facts in this particular game are the same as in those presented above. The difference, however, is that Georgia is not aware of Russia's goals and outcomes with any certainty, nor is Russia aware of Georgia's. More precisely, on 7 August, decision makers in Tbilisi receive intelligence that some elements of Russian military forces have entered the region, but their goals and precise numbers cannot be clearly determined. Villages are being shelled, and the Georgian president has to choose either to enter the region or to let the Ossetian combatants destroy the enclaves. Saakashvili personally places a call to his Russian counterpart to discover what Russia's goals are, and sends his special envoy to the region in order to establish the facts on the ground.³⁹

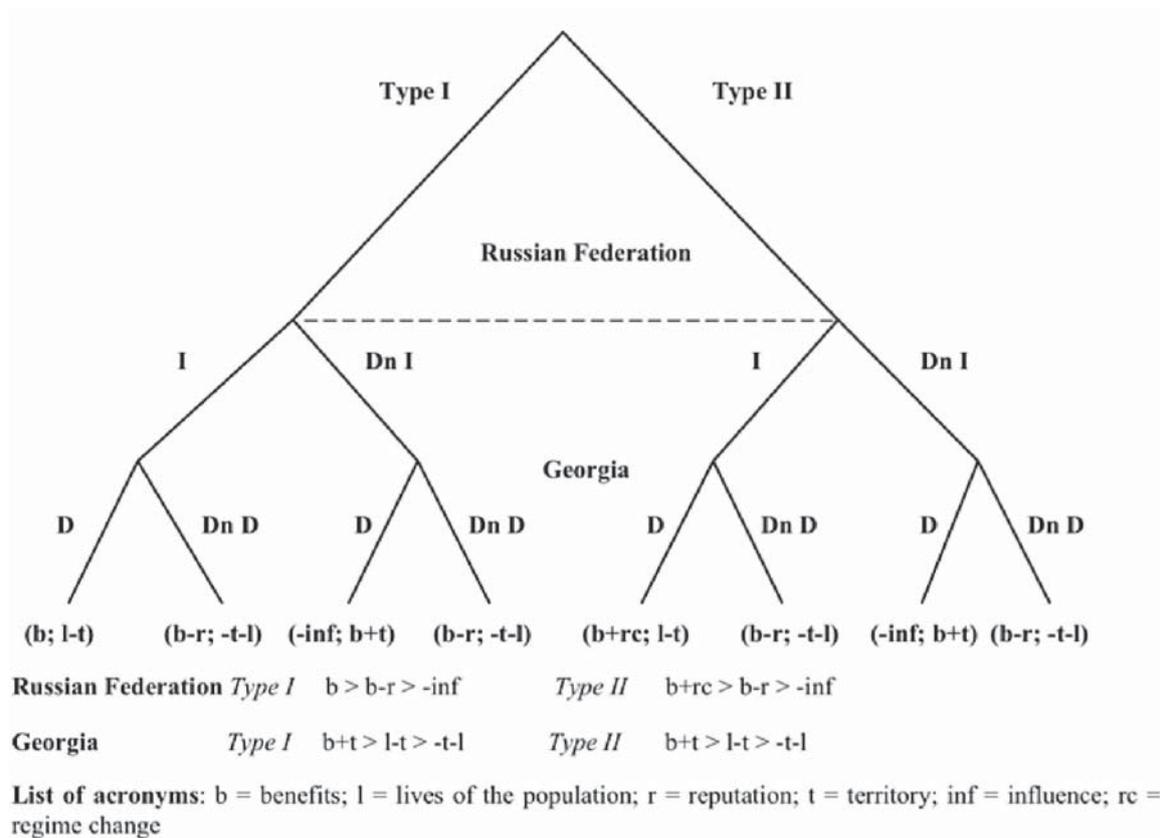
What about Moscow? Do the Russian decision makers know what Sakashvili's plans are at the moment? They do not know with any, certainty but they have their own estimates, because in response to orders from President Saakashvili, Georgian forces began to deploy at the edge of the Tskhinvali region around 18:00 hours.⁴⁰ Hence, the situation in this particular game assumes the following: shelling of Georgian controlled enclaves, some elements of Russian military forces in the region, and Georgian troops deployed on its edge. Moscow had already made its move; now it is up to Georgia to answer it.

³⁸ Gates and Humes, eds., *Games, Information and Politics*, 45.

³⁹ Asmus, *A Little War that Shook the World*, 23–33.

⁴⁰ *Ibid.*, 32.

Figure 3: Extensive-Form Representation of the August 2008 Russian-Georgian Game with Incomplete Information



Since this game is one with incomplete information, the outcomes do not have numerical values. The biggest problem for Georgia is to identify the goals of its opponent. In other words, decision makers in Tbilisi should identify what type of a player they are facing. Figure 3 contains two types of subgames. Type I is a subgame implying Moscow’s less aggressive course of action, while Type II is one showing that Russia actually wants to achieve regime change in Georgia, and therefore wants to punish its opponent. Figure 3 represents the preference ordering of the actors. However, it is not enough to find a solution to this particular game. Both sides have to assign probabilities for each other’s outcomes; based on these values, equilibrium(s) can be identified.

Suppose that taking into consideration various assumptions, Georgian decision makers believe with enough probability ($\alpha > 0.5$) that in this particular game they face a Type I opponent. They know that Russian troops are in the region, but they think that these forces probably are not going to violate the borders of South Ossetia and most likely do not intend to march on Tbilisi. Please note that the purpose of the adversary’s move is as yet unknown, but if Georgian decision makers think with a

probability of $\alpha > 0.5$ that Russia's main goal is not to punish Tbilisi, it may change Georgia's preference ordering, resulting in a different solution. What is a preference ordering of the sides if Georgia identifies its opponent as Type I? Tbilisi obviously wants to defend its citizens, and possibly hopes not to lose its controlled enclaves. This would be its best outcome. The next best is to save the lives of the people, even if it becomes impossible to maintain control over the enclaves. The worst outcome is one under which Georgia loses both the and civilian lives, causing interna political turmoil ($b+t > l-t > -t-l$).

What about the opponent? In case Russia truly is a Type I player, its best outcome is to benefit from defending themselves against the Georgian forces if Georgia decides to fight, but without causing damage to its reputation by being seen as an aggressor. The next best outcome is again to benefit from making the conflict zone more homogeneous, but this time risking damage to its reputation. (There are two $b-r$ payoffs here: the first comes as a result of Russia entering the conflict zone, while Georgia refrains; the second occurs if both players decide not to enter the region.) Finally, the least preferable outcome Moscow can have is to lose its influence in the region ($b > b-r > -inf$).

Figure 3 also illustrates what happens to the preference ordering of the players in case the Russian Federation is a Type II player. The key changes are that Moscow's preferences will become $b+rc > b-r > -inf$, while Tbilisi's will stay the same ($b+t > l-t > -t-l$). To sum up, it can be said that if Moscow is concerned with its reputation and does not want to risk violating the borders of a conflict zone, then the preference ordering of Player 2 may be the following: $b > b-r > b+rc > -inf$. However, if the punishment of tis opponent is a goal that Russia wants to pursue no matter what, then the preference ordering changes to $b+ch > b > b-r > -inf$.

As events showed, the Georgian president was more inclined to believe that Russia was a Type II player. But nevertheless, on the verge of making its move, Tbilisi does not know with full certainty who its adversary actually is: is it fighting Ossetian separatists, or the full military machine of Moscow? Realizing what possible outcomes may occur, Georgian decision makers have to compare these potential outcomes, also taking into consideration α (probability) and the type of the opponent they face.⁴¹ However, that is not an easy task, because in games with incomplete and imperfect information, players (here, Georgia) face a problem regarding expected outcomes.⁴² Tbilisi cannot say with certainty what type of player it faces, but it can make its own judgments evaluating its opponent's actions and strategy.

⁴¹ Gates and Humes, eds., *Games, Information and Politics*, 47.

⁴² Ibid.

At this point, Saakashvili sees that Russia chose to send troops into the region; from this point onward, he should probably incline to identify his opponent as Type II. But, no matter what type of opponent Player I is facing, it has to compare its expected payoff values, and then make a decision how to act.

In order to define what strategy choice would be preferable to Georgia, I introduced a simple inequality represented by Gates and Humes.⁴³ The expression to the left of inequality shows the approximate value of a strategy based on the “Defend the citizens” option, while the one on the right represents the approximate value of the “Do nothing” option: *Defend the citizens* $\alpha(b+t) + (1-\alpha)(l-t) > do\ nothing$ $\alpha(-t-l) + (1-\alpha)(-t-l)$

Georgia does not know the values of Russia’s payoffs, but it knows the values of its own with certainty. If we put the values given in Figure 2 into this inequality, we receive the following result: $\alpha 10 + (1-\alpha)(-8) > \alpha(-10) + (1-\alpha)(-10)$. Finally, we shall have: $\alpha 18 - 8 > -10$. The interesting thing emerging here is that this inequality will hardly change. It simply does not matter for Georgia whether it perceives its opponent to be a Type I or Type II player. Assigning any values from 0 to 1 to α , the inequality will hold. For instance, assume that $\alpha = 0$ —that is, Tbilisi sees its opponent as Type I. In this case, the value of the “Defend the citizens” strategy is **-8** against a **-10** for “Do nothing.” This would imply that the inequality holds, and that even if it is perceived that Russia’s main goal is not punitive in nature, priority is given to the “Defend the citizens” option. If $\alpha = 0.5$, when Georgia is indifferent or simply cannot identify its opponent as Type I or Type II, the inequality still holds. This time the result is **1** $>$ **-10**, implying that the strategy to defend prevails. Lastly, if decision makers in Tbilisi clearly identify their adversary as Type II, $\alpha = 1$, and the “Defend the citizens” option has a value of **10**.

Due to the fact that the inequality holds under any value of Alfa from zero to one, it can be concluded that Georgia is indifferent in its perception of its adversary. For Tbilisi, it will be rational to choose to defend its own enclaves both if Moscow acts aggressively against its neighbor or not. Based on these payoff values and Georgia’s beliefs about the type of opponent it faces, a (probability) solution of the game can be found. Again, it appears that Tbilisi has a dominant strategy, and therefore will choose D, regardless of the opponent’s choice. The same can be said about Moscow’s strategy, because the “Do nothing” option is beneficial if and only if Georgia would also prefer to refrain from going into the region. Hence, both in cases of incomplete information, Russia will most probably invade the region. The difference will be how aggressive the invasion will be. If Russia is a Type I player, it will claim that its goal is to restore the *status quo ante*. If Russia is a Type II player, then it will likely punish Georgia by conducting actions leading to regime change in Tbilisi.

⁴³ Ibid.

Nevertheless, the equilibrium solution for this particular game will be $\{I; (D; D)\}$.

It is slightly different from the one given in Figure 2, which is $\{I; (D; Dn)\}$. Here, unlike in a game with complete and perfect information, Georgia prefers to choose strategy D regardless of its opponent's move, and so does the Russian Federation. In other words, it is a pooling equilibrium, because Player I chooses to act in the same way regardless of its type, meaning that Player II cannot learn anything by observing the actions of the former.⁴⁴

But does it have to learn anything? Since the "punish" or "not punish" is incorporated in the "Invade" strategy, it makes a little sense for the Georgians to guess the type of player they face. For example, they will never know who they face unless the opponent invades only the region or attempts to occupy the entire country. In addition, Tbilisi's own estimates show that it is rational to choose an option to defend its own enclaves both when Moscow is identified as being either a Type I or Type II player. In other words, based on the equation introduced above, the expected values of strategy D will be always more than the expected values for strategy Dn. Thus, Georgia does not really need to distinguish between the types of the players. If so:

- Russia will:
 - Choose strategy *I* if nature chooses Russia as *Type I*
 - Choose strategy *I* if nature chooses Russia as *Type II*

- Georgia will:
- Choose strategy *D* if Russia has chosen strategy *I*
 - Choose strategy *D* if Russia has chosen strategy *Dn I*

Theoretically, knowing that Tbilisi will choose strategy D, Moscow might even be indifferent in choosing between acting as a Type I or Type II player. The question of whether or not to punish is a matter of empirics, and unfortunately could not be shown in Figure 3. I hope that those who work on the subject in the future will overcome this problem. As regards the empirics, history shows that nature chose Russia as a Type II player, and it severely punished its opponent by establishing control not over the conflict zone but almost over all of Georgia.

Are there other equilibrium solutions in this game? In order to answer this question, all the other strategy combinations for both players should be examined. However, based on the outcomes and types of strategies available to the players of this particular game, it became impossible.

⁴⁴ Evelyn C. Fink, Scott Gates, and Brian D. Humes, eds., *Game Theory Topics: Incomplete Information, Repeated Games, and N-Player Game* (Thousand Oaks, CA: Sage Publications, 1998), 21.

All other interactions between the strategies of Player 1 and Player 2 are simply eliminated under given conditions. It appears that, based on the data represented in Figure 3, the Russian Federation will always choose strategy I, while Georgia will always select strategy D. These strategies are dominant because they will always promise the best outcomes, regardless of the opponent's moves. Nevertheless, I believe that scholars working on this subject will be able to find other equilibrium solutions of the Russo-Georgian War based on different payoff values and goals of the players.

The last issue I analyze related to Figure 3 is the notion of uncertainty and its role in games of incomplete information. As I have already mentioned, uncertainty is usually a key to fiasco outcomes for a decision maker, because it implies either a lack of information or a poor interpretation of available information. Both may be responsible for a bad outcome in the end. It is difficult to answer to what extent these factors affected the decisions made in Tbilisi and Moscow in August 2008. It is likely that memoirs written by those involved in those events in the future will highlight some missing tiers of the larger story. Until then, scholars can hypothesize or draw conclusions by making theoretical applications to empirical cases.

Any decision maker as an individual or a member of a group operates as a decision-making unit oriented toward producing a concrete outcome through the implementation of various strategies (for instance, advisors in presidents' cabinets). In either case, the individuals can be named and viewed as the primary source of the decision-making process itself, because, as links between social structures and outcomes, the latter are ultimately reduced to explanations in terms of individual action.⁴⁵ Hence, while engaged in a decision-making process, actors usually select a particular strategy from a given set of strategies, which consist of the various decision sequences called choices, which are in turn made at various decision points called moves.

Actors are assumed to be able to make critical evaluations and comparisons of "consequences associated with the set of possible outcomes."⁴⁶ Strategic behavior is usually dependent on the actions and moves of one's opponents, because they seek to influence an opponent's choice by working on his expectations of how his behavior is related to one's own. Besides, each actor's best choice depends on the moves he or she expects his or her opponent to make.⁴⁷

⁴⁵ Walter Carlsnaes, "Foreign Policy," in *Handbook of International Relations*, ed. Beth Simmons, Thomas Risse, and Walter Carlsnaes (London: Sage Publications, 2007), 335.

⁴⁶ Frank C. Zagare, *Game Theory: Concepts and Applications* (Thousand Oaks, CA Sage Publications, 1984), 12.

⁴⁷ Graham Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed. (New York: Longman, 1999), 41.

This aggregation of decision makers' choices and actions underline the complexity of the decision-making process itself, placing a great emphasis on the environment where decisions are made. Thus, if an environment has an element of uncertainty, as was shown in Figure 3, a decision-making unit should have problems determining what information it possesses and/or how to interpret that data.

According to Schelling, strategy analyzes and explains the maze of national actions and reactions as more or less advantageous moves in a game of interdependent conflict.⁴⁸ He points to the critical importance of information as a basis of actors' actions, and highlights the notion of interdependence, related to the ability to make the best possible choices depending on the choices made by one's opponents.⁴⁹ While this claim is plausible, it does not mean that decision makers necessarily possess full and reliable information when fulfilling their daily activities. In other words, uncertain environments put constraints on actors' problem-solving capabilities, which may lead to disastrous outcomes.

Was this the case with Georgia when its forces entered the conflict zone? According to Simon, the principles of pure rationality cannot really make good predictions about various political phenomena if they neglect relevant auxiliary assumptions and do not take into account the importance of the extensive empirical research.⁵⁰ Moreover, he argues that decision makers usually terminate their search for the best possible decision as soon as they come up with a suitable and satisfactory outcome. Simon proposes that in order to understand this kind of behavior, it is necessary to specify what the problem solver wants, knows, and can compute.⁵¹

This claim has a point, but it is also debatable, because usually it never works out quite so neatly: for example, we rarely see cases where U.S. presidential advisers either terminate a search for a strategy because they have imperfect information or simply accept the first satisfactory outcome. Uncertainty pushes decision makers to assign estimates, form expectations—or, as Simon argues, to come up with auxiliary assumptions.⁵² For instance, examples of decisions made in conditions of uncertainty, like those around the Bay of Pigs invasion and the Cuban Missile Crisis illustrate that, even under conditions of uncertainty, decision makers were trying to achieve the best possible outcomes. Hence, if the situation involves uncertainties, actors prefer at least to choose the alternative for which the expected utility is the highest.

⁴⁸ In *ibid.*, 40–41.

⁴⁹ In *ibid.*, 41.

⁵⁰ Herbert A. Simon, "Human Nature in Politics," 296, 303.

⁵¹ *Ibid.*, 295.

⁵² *Ibid.*, 296–97.

By “expected utility of an alternative,” I mean the average of the utilities of the different possible outcomes, each weighted by the probability that the outcome will ensure if the alternative question is chosen.⁵³

The equation showing the average value of different strategies shows that Tbilisi was rational when choosing strategy D, because it promised the most benefits. Thus, from a theoretical standpoint, given that they were operating in an uncertain information environment, the Georgian decision makers were rational. When uncertainty is high, success or failure related to both the decision-making process and its outcome depends on the relationship “between the importance of an assessment and the likelihood that latter will be accurate.”⁵⁴ Thus, alongside the available data, individual factors also play an important role. Decision makers may misinterpret even relatively full information sets.

Obviously, the data provided by the intelligence service of Georgia was solid, but it was not complete. Tbilisi knew about its opponent’s actions, but did not know with certainty why the Russian Federation decided to cross the border (unlike the situation in 2004). As Ronald Asmus points out, “President Saakashvili’s decision to fight ... was a desperate response to what he believed was the imminent threat of the ethnic cleansing of tens thousands of Georgian citizens, the possible loss of South Ossetia and Abkhazia once and for all, and a possible Russian assault on Tbilisi itself.”⁵⁵ Here it can be seen that personal factors are responsible for Georgia’s decision to regard Russia as a Type II player, one that was going to punish them regardless. Nevertheless, the very fact that decision makers operate in a fundamentally uncertain environment, and that actors themselves generate uncertainties, leads to the realization that the occurrence of strategic surprises is simply the natural order of things. However, it does not imply that decisions made under conditions of uncertainty will always lead to bad outcomes. In the end, it all depends on the capabilities and resources available to the players—and in terms of resources, Georgia and Russia are hardly comparable.

⁵³ Ibid., 296.

⁵⁴ Richard Betts, *Enemies of Intelligence: Knowledge and Power in American National Security* (New York: Columbia University Press, 2007), 31.

⁵⁵ Asmus, *A Little War the Shook the World*, 10.

Representation and Analysis of the Game: Figure 4

While it is still difficult to say to what extent uncertainty affected the decisions made in Moscow and Tbilisi in August 2008, the readiness and resolve with which Moscow dealt with the situation remains remarkable. The fact that the Russian Federation could deploy almost 40,000 troops to Georgia in only five days underlines the importance of the Georgian situation for Moscow, and raises at least two questions: What were its real goals? And did it consider the game in zero-sum terms?⁵⁶

Officially, Operation “Compulsion to Peace” was intended to stop the “genocide” against the Ossetian people by reinforcing Russia’s own peacekeepers and drawing Georgian forces out of the region. However, in reality, Russia’s military operation expanded greatly beyond the conflict zone, resulting in an occupation of almost all of Georgian soil. Accusations from Moscow that Georgians were carrying out a genocide against the Ossetian population in the conflict zone were dismissed by the Tagliavini Report as “neither founded in law nor substantiated by factual evidence.”⁵⁷ Moreover, while the report indicates that Georgia was the first one to fire in this war, it clearly states that Russia’s military operation “cannot be regarded as even remotely commensurate with the threat to Russian peacekeepers in South Ossetia,” and also concludes that the distribution of Russian passports in the region over the past several years was an illegal action.⁵⁸ The very fact that Moscow intervened with all its might and deterrence indicates that the stakes were viewed in the Kremlin as being extremely high—high enough to put almost all of Russia’s chips on the table.

So, what made Russia’s strategy in this game strictly dominant? According to Asmus and Felgenhauer, Moscow’s real goals were different from just defending the Ossetian population.⁵⁹ Namely, the Kremlin’s key motives were to eliminate Georgian control over the enclaves inside the conflict region, achieve regime change in Georgia, and make sure Georgia could not join NATO. If those were the primary goals of the Russian Federation, and if Georgia’s goal was to protect its own population, possibly preserving the *status quo ante* or even restoring its territorial integrity, then it is possible to analyze the Russo-Georgian War from the perspective of a zero-sum situation. Figure 4 is a normal form of representation of this game.

⁵⁶ Ibid., 165.

⁵⁷ Ibid., 221.

⁵⁸ Ibid.

⁵⁹ Asmus, *A Little War that Shook the World*, 108, 170–82; Felgenhauer, in Cornell and Starr, *The Guns of August 2008*, 162.

Figure 4: Normal-Form Representation of the August 2008 Russian-Georgian Game

		Georgia	
		Defend the enclaves	Do Nothing
Russia-Ossetia	Back Ossetians	A. War (3; 3)	C. Russia establishes military presence leading to possible regime change; Georgia loses control over its enclaves; population oppressed (4;1)
	Do Nothing	B. Russia loses control in the region; Georgia restores its territorial integrity (1;4)	D. Russia fails to achieve regime change and to stop Georgian integration to NATO; Georgia loses control over its enclaves; population oppressed (2;2)

The essence of a zero-sum game lies in the fact that the players' preferences are exactly opposite; the goals of the actors listed above actually show the conflict of interests.⁶⁰ Unlike in previous games, Russia-Ossetia is presented as one player, because both have a common preference to eliminate the Georgian presence in the conflict zone. The matrix shows four possible outcomes based on the strategies available to the players and their outcomes. Note that this time the payoff values range from one to four, because the aim of this particular game is not to show the exact complexity and weights of preferred choices, but rather to introduce the zero-sum character of the conflict.

In order to select a strategy in a zero-sum game, players can first observe which strategies maximize their security level, and which strategies on the contrary make them vulnerable. According to the maximin principle—which holds that a decision should be based on an effort to maximize the minimum possible gain—when these are defined, players can see what courses of action they should take to maximize their security level.⁶¹

⁶⁰ Zagare, *Game Theory: Concepts and Applications*, 21.

⁶¹ Zagare, *Game Theory: Concepts and Applications*, 23.

Figure 4 shows that the Russia-Ossetian security level is high if it chooses the offensive strategy (Back Ossetians). The same can be said about the security level of Georgia, which is maximized if Tbilisi chooses to protect the enclaves. Thus, in order to maximize their own security levels, Russia has to back the Ossetians, and Georgia has to defend its own enclaves. If players of this particular game follow this theoretical principle, then they chose their best, optimal strategies, which will shall lead them to Outcome A. Outcome A contains the same payoff values for both Tbilisi and Moscow, and is achieved because none of the players have an incentive to unilaterally change their strategies. Hence, {B; D} is an equilibrium of this particular game. However, it should be noted that it is achievable only if both players are determined to follow the choices that best maximize their security. If for some reason they do not follow this principle, the outcome may not result in any equilibrium solution at all. If the maximin principle is complied with, then it simply does not matter whether Player I knows about its opponent's choice or not. But if for some reason Player II chooses not to follow the utility maximizing principle, and Player I had knowledge of it, then the former may be punished (or vice versa).⁶² For instance, it may happen that Russia will choose the "Do nothing" strategy, and Georgia, knowing about it in advance, will choose strategy to "Defend the enclaves."

This particular game has another possible equilibrium solution. If the players do not follow the maximin principle, and if their strategies are not dominant, then they might end up with outcome D. This time the equilibrium solution is {Dn; Dn}. The possible motivation for Russian Federation to choose strategy Dn should be fear to lose own reputation and hope that Georgia will not engage separatist forces fearing to provoke a retaliation. Theoretically, it is still an equilibrium, despite the fact that Russia's main goal to achieve regime change and stop Georgia from entering NATO is not achieved and Georgia, with the government intact and having no obstacles towards NATO integration, loses enclaves inside the conflict zone.

This type of equilibrium is usually hard to achieve, because players have no incentives to risk their security levels in non-repeated games; however, in case the game is repeated, then under some circumstances players can chose sub-optimal strategy among available to benefit on the long run. Hence, Figure 4 shows that in this particular game there are only two possible equilibrium solutions and due to the fact that this game is not repeated outcome will most likely result in solution {B; D}.

⁶² Zagare, *Game Theory: Concepts and Applications*, 31.

Conclusions

The Russo-Georgian War that took place in August 2008 was the culmination of the fast deteriorating relationships between Moscow and Tbilisi. It raised many discussions among politicians, historians and scholars. This thesis made a game theoretical application of Rational Actor Model (RAM) to this concrete historical event. In particular, it answered the question whether decisions taken by actors could be regarded as rational. In order to test this I built four different games related to the Russo-Georgian war trying to analyze decisions taken by actors, focusing on various circumstances and trying to define equilibrium solution of each of these games. I also tried to define other alternative outcomes; solutions of the game that could have possibly emerged had players of this game acted in a different manner.

The four game theoretical models included three crucial stages of model building: conceptualization, operationalization and interpretation. The formal structure of each game included players, their payoffs and their nodes of decisions, actions and information sets. Operationalization of all four games showed that game theoretical application of RAM to this empirical case was successful. In addition, I was able to delineate strategies available to players and found solutions to all four game instances, which leads to the conclusion that decisions taken by both players were rational.

Analysis of game Figure 1 showed that outcomes and preference ordering of the players do not change no matter who starts the game, leading to assumption that both Moscow and Tbilisi have dominant strategies in this game. For better understanding why those strategies were dominant and what the players' motivation were I introduced game Figure 2, a sequential game with complete and perfect information. Analysis showed that the main argument for the Russian Federation to pursue dominant strategy in this game was the fact that, on the one hand, it maximized its utility which was rational, and on other the "Do nothing option" would have lead to the loss of reputation. As regards Georgia, it appeared that its dominant strategy was based merely on two things: necessity to defend its own enclaves and allies (the Sanakoev administration) and the negative political consequences had the "Do nothing" strategy been chosen.

Since the majority of games do not necessarily imply existence of complete and perfect information, I built another game model that included probability distribution for each node. Conceptualization of Figure 3 showed that Georgia would always go for the strategy "Defend the enclaves", because regardless of α value - that is regardless of how Georgians perceived their opponent (Type I or Type II) - Tbilisi was better off defending controlled villages. Another interesting finding was that Georgia was not able to understand Russia's intentions by observing the actions, unless the latter made it clear. That is, had the Russian Federation gone beyond the conflict zone

it would have been regarded as a Type II player; had it stopped the conflict without occupying the rest of the Georgia, it would have been regarded as a Type I player. Hence, according to game theoretical concepts, player 1 (Russia) would at least have entered the region, with incentives to unilaterally change the strategy - to punish or not punish the opponent - and player 2 (Georgia) would have chosen to maximize its security level regardless opponent's moves.

The determination and readiness of Moscow to deal with the problem was remarkable. Suggestions of some experts like Asmus, Illarionov and Felgenhauer introduced above about Russia's real goals, together with the presence of dominant strategies for both players, raised questions about zero-sum character of this game, which was presented in Figure 4. The analysis showed that, first of all, it was possible that players considered themselves on zero-sum terms, and secondly, it once again underlined that depending on their goals and preference ordering each would have chosen strategies maximizing own security levels regardless opponent's move.

In the end, I would like to reiterate that my research has been a successful attempt of game theory application to the particular case of the Russo-Georgian War. The problems I encountered while working on it were related first of all to the absence of rich data, so, the conclusions are uncertain. Nevertheless, I am sure that my work has provided some insights concerning those tragic events of August 2008 while still leaving other questions unanswered. However, when more data becomes available more light will be shed on this particular case, making application of other game theoretical or decision-making theories and, therefore further contribution, possible.

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