

## ZERO-SUM GAMES AND MIXED-MOTIVE GAMES IN THE FIGHT OF THE RUSSIAN FEDERATION WITH THE WEST FOR UKRAINE

**Sebastian Blidaru, PhD Student**

National University of Political Studies and Public Administration  
Bucharest, Romania  
blidaru.sebastian@yahoo.com

### **Abstract**

Researchers' attention for the *Game Theory* increased during the Cold War, and even more after this moment, therefore nowadays it is being used in multiple domains. This evolution led, inevitably, to the overuse of different concepts and/or elements, an eloquent example being what happened during the Ukrainian crisis of 2014 and after it.

The main purpose of this paper is to examine the “race” for Ukraine between the Russian Federation and the West, analysed through the concepts of *zero-sum games* and *mixed-motive games*. The research will focus on the Russian state. The conclusions of my endeavour are that the *zero sum-games* are too simplistic and are not the appropriate tool to use to understand the foreign policy of the Russian Federation, whereas the *mixed-motives games* are more suited for this kind of process.

### **Keywords**

Mixed-motive games; the Russian Federation; the West; Ukraine; zero sum-games.

## 1. INTRODUCTION

The year of 2014 marked the international scene and the near future in a fundamental manner. Although one may remember other difficult times, like the Russian military intervention in Georgia, from 2008, the Chechen conflict, or the disputes with Ukraine over the transit of Russian energy resources to Europe, we can say that, after the Cold War and the disintegration of the Soviet Union, nowadays we witness the most tense situation between the West and the Russian state under Vladimir Putin.

After the annexation of Crimea and Sevastopol, the West condemned such actions and decided to react by introducing a series of economic sanctions. The conflict in Syria, where the Kremlin chose to intervene in supporting Bashar al-Assad, against the Western interests, is a good indicator of the increasing tension which led to a great deal of attention on the military dimension of states.

Moscow's decisions regarding Syria led to an extremely tense and dangerous event in 2015, when the Turkish aviation shot down two SU-24 Russian planes, after the two aircrafts ventured on Turkish territory. It was the first time since 1950 when one of NATO's members shot down a Russian military plane.

As expected, the actions from 2014 changed the researchers' perception. In an analysis of the international think tank The Jamestown Foundation, named "*Syrian War and the Return of Zero-Sum Thinking in Russian-US relations*", Pavel Felgenhauer<sup>1</sup> (2017) states, about the relationship between the United States and Russia, that "Washington and Moscow are becoming ever more deeply engaged in a worldwide zero-sum game, with no letup in sight". Rolf Mowatt-Larsen<sup>2</sup> (2016), senior fellow at Harvard Kennedy School's Belfer Center for Science and International Affairs, also highlighted the present situation, saying: "Left unchecked, the zero-sum game the US and Russia are playing will produce the

---

<sup>1</sup> He is a Moscow-based defense analyst and columnist for *Novaya Gazeta* as well as a non-resident senior fellow at The Jamestown Foundation.

<sup>2</sup> Served over three years as the Director of Intelligence and Counterintelligence at the U.S. Department of Energy, and he also worked for 23 years as a CIA intelligence officer in various domestic and international posts.

global disorder neither country desires". They labelled Kremlin's foreign policy, regardless the subject, as being one which falls into the category of *zero-sum games*, but, as mentioned before, the main objective of this paper is to highlight the limited degree of a *zero-sum* approach, in relation to the more elaborate *mixed-motive* one, and the contemporary need to overcome this bellicose logic.

The methodological approach is based on document analysis and conceptual analysis. For the direct document analysis, I will use: The Foreign Policy Concept of the Russian Federation from 2013 and 2016; The Military Doctrine of the Russian Federation – 2014, National Security Strategy of the Russian Federation – 2015; the European Neighbourhood Policy and the Eastern Partnership; Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization – 2010, Wales Summit Declaration – 2014, Warsaw Summit Communiqué – 2016, and other public statements; for the indirect analysis, I will use research documents.

From a theoretical point of view, this paper is based on elements of *Game Theory*; I intend to explore here the events regarding the above-mentioned subject between 2014 and 2017 through the categories of *zero-sum games* and of *mixed-motive games*.

The hypothesis of this paper is that the concept of *zero-sum games* is limited, therefore, a more complex approach is needed. Even if the first concept (of *zero-sum games*) can be seen as useful in the context of the fight for Ukraine between the Russian Federation and the West, it is also limited.

## 2. GENERAL ELEMENTS OF GAME THEORY

The ideas behind *Game Theory* can be found, in the view of some authors, long before the twentieth century in "[...] the Bible, the Talmud, the works of Descartes and Sun Tzu, and the writings of Charles Darwin" (Huang 2010, 1), but others consider that it started with "[...] the work of Daniel Bernoulli, a mathematician born in 1700" (Huang 2010, 1), or with the work of Thomas Bayes (Huang 2010, 1), who offered the famous theorem.

Most authors consider the year of 1944 the main starting point in *Game Theory*. John von Neumann and Oskar Morgenstern publish "*Theory of Games and Economic Behaviour*". Between 1950 and 1960, *Game Theory* was mainly applied to solve problems in politics and war. Due to these developments, in the late 1960s and early 1970s, *Game Theory* became "[...] a new formal language for economics in particular" (Hans 2008, 2). This period coincides with the moment when *Game Theory*, as a way of approaching strategic situations, has begun to be used in multiple/different fields, including in the economic sphere, in international relations, business, biology.

Consequently, *Game Theory*, and everything related to it, has expanded substantially through the establishment of numerous research centres in different countries and universities. It has been successfully applied in areas like "[...] evolutionary biology (Maynard Smith 1982; Selten 1980) and computer science, where system failures are modelled as competing players in a destructive game designed to model worst-case scenarios" (Kelly 2003, 14).

*Game theory* "[...] analyses the interaction between agents and formulates hypotheses about their behaviour and the final outcome in games [...]" (Finus 2001, 1), or, in other words, "Game theory is concerned with how rational individuals make decisions when they are mutually interdependent" (Romp 1997, 1). This leads us to the core element of *Game Theory*, the concept of instrumental rationality which means "[...] that individuals are assumed to act in their own self-interest. This supposes that individuals can determine, at least probabilistically, the outcome of their actions, and have preferences over these out-comes" (Romp 1997, 2). An element of individualism in *Game Theory* means that the subjects are always trying to maximize their own interests. It is also important to specify this mutual interdependence, which translates here by the fact that "[...] in this situation, the welfare of any individual in a game is, at least partially, determined by the actions of other players in the game" (Romp 1997, 3).

Before going further, I have to mention here some of the most important, but by no means all the limits of *Game Theory*. Starting from the idea which claims that, "Of the serious challenges to game theory mounted over the last few years, the three issues of rationality, indeterminacy and inconsistency are the most

interesting” (Kelly 2003, 174), in what follows, I will explore two of those dimensions. Instead of talking about inconsistency, which concerns the technique of backward induction and the concept of subgame perfect Nash equilibrium, I will include the limits which refer to the game rules.

The first critique focuses on instrumental rationality which can be problematic in a game like Prisoner’s Dilemma. In this specific situation “Instrumental rationality suggests that the players in such a game should refuse to cooperate, yet they can both do better by rejecting this strategy” (Kelly 2003, 175). This has led many researchers (like those mentioned above, but not only) to discuss the possibility of identifying other definitions for the concept of rationality (and a starting point is the work of Immanuel Kant – Kantian rationality or with the elements of bounded rationality associated with Herbert A. Simon).

The second major critique is centred on the fact that *Game Theory* “[...] sometimes fails to deliver unique solutions, usually because the game has more than one equilibrium. In such cases, the optimal strategy remains undetermined and selections are usually made on the basis of what players think other players will do. Therefore, strategic selection is not necessarily rational” (Kelly 2003, 177).

Regarding the category of the game rules, in which we find “[...] the set of players in a game, the strategies or choices they confront, the way these choices are sequenced, the preferences of actors, and the information actors possess when they make their choices” (Tsebelis’s work as cited in Munck 2001, 184), the main critique is the fact that all elements mentioned above “[...] are taken to be exogenous and hence assumed to be given and to remain constant [...]” (Munck 2001, 184). In Munck’s opinion (2001, 184), this fact “[...] leaves unanswered a critical question: why is one game, as opposed to a range of other conceivable games, played when it is?”.

Taking into account all critics above, even if a theoretical model is able to produce explanations and to indicate possible predictions, this does not necessarily mean it has the key to *all* possible analyses. Thus, this paper starts from the presumption that *Game Theory* is a consistent tool (some of the games are more complex than others, therefore, the complexity should bring more light to a subject or other) to understand as much as possible, but not totally, the dynamics of the international stage.

## 2.1. What is a game

In a game we identify “[...] a number of players N, a set of strategies for each player, and a payoff that quantitatively describes the outcome of each play of the game in terms of the amount that each player wins or loses” (Barron 2008, 1). For a better understanding, it is necessary to briefly explore the elements we find in a game. The number of players can vary considerably but is often limited to only two. In the specific situation of this paper, I will start from the presumption of the existence of two camps, well-defined: on the one hand, the Russian Federation, and, on the other hand, the West (EU/USA-NATO).

Another element we have in a game is a number of strategies of actions which represents “[...] a predetermined *way of play* that guides an agent as to what actions to take in response to past and expected actions from other agents” (Huang 2010, 2).

A specific combination of strategies leads to the agent payoff, or utility, a concept “[...] that refers to the amount of satisfaction that an agent derives from an object or an event” (Huang 2010, 2).

As I mentioned before, *Game Theory* has grown substantially, this fact being felt also when we talk about the types of existing games. From the perspective of this article, the attention is focused on *zero-sum games* and *mixed-motive games*. The first category, in which “[...] players’ interests are conflicting (i.e. strictly competitive games) are known as zero-sum games of strategy, so called because the pay-offs always add up to zero for each outcome of a fair game, or to another constant if the game is biased” (Kelly 2003, 6). The second category, of the *mixed-motive games* of strategy, “[...] in which the interests of players are neither fully conflicting nor fully coincident [...]” (Kelly 2003, 7), it is a more complex approach. I consider rather important to underline that, in the case of *mixed-motive games*, the solutions are multiple, and even more, the idea of cooperation stands, as the players get more interested (or – knowing which the stake is – even somehow obliged to) in working together towards a solution as opposed to the win/lose game presented before. Thus, in both situations, *zero-sum* or *mixed-motive games*, players know that losing can be a disadvantage for both sides, but,

if in the first case, the only purpose is winning, in the second, the strategic game becomes more important.

In what follows I will explore these concepts belonging to *Game Theory* and I will apply them to the present situation of the confrontation between the Russian Federation and the West. A first step is to identify, as accurately as possible, the positions of each side in this struggle for Ukraine.

### 3. THE ACTORS STANDING POINT TOWARDS UKRAINE

#### 3.1. The Russian Federation and Ukraine

In the '90s it seemed Russia wanted a closer cooperation with the West, but after the upraise of a new leader at Kremlin, the Russian state returned to the old ambitions and preoccupations.

Fiona Hill and Clifford G. Gaddy (2013, 3) described very expressively Vladimir Putin as being “[...] ‘a man from nowhere’, who can appear to be anybody to anyone. Indeed, as president and prime minister, Mr. Putin has turned himself into the ultimate political performance artist”. This kind of an apparently unimportant person, who raises from the people (as one can remember the communist assertion) is not uncommon, and one political character with these *qualities* can actually change the political stage, not only for its country and interests, but for the entire surrounding area.

Besides the new leadership (after the year of 2003), and the existence of global-power aspirations, I must mention, that the assertiveness of Putin’s Russia is also due to the constant fear of an invasion. This fear is grounded on the fact that “the country was often in an uncertain and volatile external environment and could only survive by constantly defending its unstable borders from the expansionist ambitions of its neighbors” (Tsygankov 2012, 31).

In the process of establishing Russia’s standing point toward the West and Ukraine, I will use information from the Foreign Policy Concept of the Russian Federation, approved on November 30<sup>th</sup>, 2016, and the previous Concept, released on February 12<sup>th</sup>, 2013. I am aware the two official documents, and

others which are mentioned below, do not represent the whole picture over the Russian position regarding the West and Ukraine, but they provide a substantial insight into the Kremlin's approach. Followingly, I will try to add to the perspective which emerges from these strategic documents, some aspects of the public speeches of Vladimir Putin.

The latter document emphasizes, among other things, that "For the first time in modern history, global competition takes place on a civilizational level [...]" (Concept of The Foreign Policy of the Russian Federation 2013), situation in which "Russia pursues an independent foreign policy guided by its national interests and based on unconditional respect for international law" (Concept of The Foreign Policy of the Russian Federation 2013). Regarding Ukraine, in the Foreign Policy Concept it is mentioned that Russia will: "[...] build up relations with Ukraine as a priority partner within the CIS, [and] contribute to its participation in extended integration processes" (Concept of The Foreign Policy of the Russian Federation 2013). This highlights the importance of Ukraine for the Russian Federation from the perspective of political, economic, military and other dimensions (relevant for the main objectives of the Commonwealth of Independent States).

The document from 2016 underlines that "The world is currently going through fundamental changes related to the emergence of a multipolar international system [...] The struggle for dominance in shaping the key principles of the future international system has become a key trend at the current stage of international development" (The Foreign Policy Concept of the Russian Federation 2016). This is the context when the Russian Federation "[...] conducts an assertive and independent foreign policy guided by its national interests and based on unconditional respect for international law" (The Foreign Policy Concept of the Russian Federation 2016). As we can see, from the document in 2013 to the one in 2016, a different formulation ("assertive and independent foreign policy") can be identified, one which specifically underlines that, after 2016, the Russian Federation will pursue in a more focused manner its own interests on the international scene.

In the category "Strengthening International Security" one can find out that "Russia facilitates the resolution of regional conflicts by political and diplomatic



means through collective action by the international community, believing that such conflicts can only be resolved through inclusive dialogue and negotiations involving all sides rather than by isolating any of them" (The Foreign Policy Concept of the Russian Federation 2016). Subsequently, in the section called "Regional Foreign Policy Priorities of the Russian Federation" is mentioned that the Russian state is "[...] interested in developing political, economic, cultural and spiritual ties with Ukraine in all areas based on mutual respect and commitment to building partnership relations with due regard for Russia's national interests" (The Foreign Policy Concept of the Russian Federation 2016). This section of the second document highlights, on the one hand, that Russia is an important player in the regional context and, on the other hand, the fact that Moscow will not renounce at its interests in this area, especially regarding Ukraine.

Following the Ukrainian events, in 2014, the new Military Doctrine of the Russian Federation was also approved. In the category "General Provisions" is specified that: "The Military Doctrine reflects the commitment of the Russian Federation to protect national interests of the country and the interests of its allies [...]" (Military Doctrine of the Russian Federation 2014). This strategic document identifies, as some of the main risks for the Russian state, the "[...] power potential capacity of the North Atlantic Treaty Organization (NATO) [...]" The approach of the military infrastructure of the countries which are NATO members near the Russian Federation borders [...]" (Military Doctrine of the Russian Federation 2014). In the same time, the further expansion of the military organization is seen as a threat. Dmitri Trenin (2014b) synthesized the essence of this document: "The new iteration of Russia's military doctrine makes it clear that even if the West is not officially an adversary, it is a powerful competitor, a bitter rival, and the source of most military risks and threats".

The last document quoted here is the one approved on December 31<sup>st</sup>, 2015, by the president Vladimir Putin, the National Security Strategy of the Russian Federation. In this document we can see the differences of vision between Russia and the West, "The Russian Federation's implementation of an independent foreign and domestic policy is giving rise to opposition from the United States and its allies, who are seeking to retain their dominance in world affairs"

(National Security Strategy of the Russian Federation 2015). It is also mentioned (about NATO), that: “[...] the further expansion of the Alliance, and the location of its military infrastructure closer to Russian borders are creating a threat to national security” (National Security Strategy of the Russian Federation 2015). The Kremlin administration also adds that according to their vision the West incites at coloured revolutions. Regarding Ukraine, the Russian document emphasized that “[...] the support of the United States and the European Union for the anti-constitutional *coup d'etat* in Ukraine led to a deep split in Ukrainian society and the emergence of an armed conflict” (National Security Strategy of the Russian Federation 2015). Thus, from the perspective of Kremlin’s administration, what happened in Ukraine in 2014 and after, is the West’s fault. The 2015 National Security Strategy roughly contains the same features as the other official documents: it has a bellicose character, it justifies the actions/visions of the Kremlin and underlines the insecurity of the Russian state. Together with the image detached from the official documents, the position of the Russian Federation regarding Ukraine, and more specifically towards Crimea, can also be seen in the public statements of the Russian president. Vladimir Putin (2014) declared that “Crimea is our common historical legacy and a very important factor in regional stability. And this strategic territory should be part of a strong and stable sovereignty, which today can only be Russian.” Regarding the extension of NATO, Putin (2014) underlined that “We are against having a military alliance making itself at home right in our backyard or in our historic territory” and that in this situation the Russian Federation had to “react accordingly” (Direct Line with Vladimir Putin 2014). The Russian leader has often expressed this view concerning Ukraine and the West, being a fierce critic of any action contrary to the interests of the Russian Federation. His position is also consistent with the view expressed by the official documents (Russia is a great power in a multipolar international system; NATO is a threat; the Russian state’s interests regarding the “common neighbourhood” cannot be neglected by the international community).

### 3.2. USA/ NATO – EU and Ukraine

In the Ukrainian context, from my point of view, it is important to recall NATO's position regarding the Eastern space, and consequently Ukraine. One of the main elements of the Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization is that "it restates our firm commitment to keep the door to NATO open to all European democracies that meet the standards of membership, because enlargement contributes to our goal of a Europe whole, free and at peace" (Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization 2010). Regarding Ukraine, the aim was to "[...] continue and develop the partnerships with Ukraine and Georgia within the NATO-Ukraine and NATO-Georgia Commissions, based on the NATO decision at the Bucharest Summit 2008, and taking into account the Euro-Atlantic orientation or aspiration of each of the countries" (Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization 2010). We have to keep in mind that, at the Bucharest NATO Summit in 2008, Vladimir Putin already expressed his concerns about the possibility of Ukraine's accession to the Alliance. Moreover, in the context of a post-2014 reality, it seems necessary to develop a new strategic document of the North Atlantic Alliance, one that will accommodate the current tense situation of the international stage.

Following the events from 2014, at the NATO Summit in Wales, the Alliance condemned the illegal annexation of Crimea and the Russian military intervention in Ukraine, emphasizing that "This violation of Ukraine's sovereignty and territorial integrity is a serious breach of international law and a major challenge to Euro-Atlantic security" (Wales Summit Declaration 2014).

NATO member countries reiterated their position at the Summit in Warsaw, 2016, in favour of a settlement of the conflict. As mentioned above, the Russian Federation is also prepared for a settlement of the conflict in Ukraine, but not in the terms that the West wants.

The heads of state and government participating in the meeting in Warsaw added that the Alliance "[...] will continue to support Ukraine in carrying out its reform agenda, including through the Annual National Programme in the

framework of our Distinctive Partnership” (Warsaw Summit Communiqué 2016). At the Warsaw Summit, they also adopted the Comprehensive Assistance Package “[...] aimed at consolidating and enhancing NATO’s support to Ukraine, including by tailored capability and capacity building measures for the security and defence sectors [...]” (Warsaw Summit Communiqué 2016). These efforts of the Alliance seem to suggest they are continuously trying to adapt to the “new reality”, where much more attention is paid to the interests of the Russian Federation in Eastern Europe.

After a speech at the École Militaire in Paris, NATO Secretary General, Jens Stoltenberg was asked if the Alliance should or could include new members, referring explicitly to the case of Ukraine. Stoltenberg (2017) declared that “[...] NATO’s door is open [...] the question is whether we are going to have new members [...] My message is that whether these countries are going to become members of NATO or not it’s only up to the applicant or aspirant countries to decide, and the 29 allies”. Despite the fact that the Alliance expresses the possibility to include new members, it is difficult for Ukraine, at least in the near future, to obtain a “yes” from NATO, especially in the context of Russia’s opposition.

Concerning the EU position, as mentioned before, I chose to invoke the European Neighbourhood Policy and the Eastern Partnership. Not wishing to explore the historical evolution, effectiveness, and usability of these tools, I will limit my incursion at the EU’s position towards Ukraine. The main objective of the European Neighbourhood Policy, launched in 2003 and developed in 2004, was to “[...] share the benefits of the EU’s 2004 enlargement with neighbouring countries in strengthening stability, security and well-being for all concerned” (Communication from the Commission 2004), also emphasizing the necessity “[...] to prevent the emergence of new dividing lines between the enlarged EU and its neighbours and to offer them the chance to participate in various EU activities, through greater political, security, economic and cultural co-operation” (Communication from the Commission 2004).

Following the “Arab Spring” in 2011, the ENP was reviewed. The process repeated also in 2015 when the “Review of the European Neighbourhood Policy” emerged. The objective of the new ENP is “[...] to propose how the EU and its

neighbours can build more effective partnerships in the neighbourhood.” (Review of the European Neighbourhood Policy 2015, 2), and the focus is on the stabilization of the region in political, socio-economic and security-related terms. It is also very important to mention that “Differentiation and greater mutual ownership will be the hallmark of the new ENP, recognizing that not all partners aspire to EU rules and standards, and reflecting the wishes of each country concerning the nature and focus of its partnership with the EU”. (Review of the European Neighbourhood Policy 2015, 2). In the specific context of Ukraine, Georgia and the Republic of Moldova, countries which signed the Association Agreements/Deep and Comprehensive Free Trade Areas, is specified that “The EU will work with those partners to further develop their relations and to maximise the benefits for both parties to those agreements” (Review of the European Neighbourhood Policy 2015, 4).

After the moment of 2008, when the Russian Federation military intervened in Georgia, a more concentrated version of ENP, the Eastern Partnership was issued. In the joint declaration of the Eastern Partnership Summit from Riga was reaffirmed that: “Summit participants recommit themselves to strengthen democracy, rule of law, human rights and fundamental freedoms, as well as the principles and norms of international law, which are and have been at the heart of this Partnership since it was launched [...]” (Joint Declaration of the Eastern Partnership Summit 2015, 1). This vision can also be found in the declaration which followed the 5<sup>th</sup> Eastern Partnership Summit, in November 24, 2017. In the last document mentioned above, it is stated that “[...] it is timely to engage the AA/DCFTA partners in joint discussions on the progress, opportunities and challenges concerning the association-related reforms, as requested by these partners, and with the aim of facilitating full implementation of the AA/DCFTAs”. (Joint Declaration of the Eastern Partnership Summit 2017, 4).

Both the Eastern Partnership and the European Neighbourhood Policy are intended to support the European trajectory of Ukraine, or of any other included states. However, it should be noted that the Association Agreement it is not a clear promise for EU membership. This path is encouraged also by leading figures of the EU, such as Donald Tusk, who, with the occasion of EU-Ukraine Summit in 2017, stated that “[...] for me the key sentence of the Association

Agreement still is that, and I quote, ‘the European Union acknowledges the European aspirations of Ukraine and welcomes its European choice’ ”, or Federica Mogherini (2018), who emphasized that “The European Union is Ukraine’s partner and strongest supporter in striving to build a stable, prosperous democracy and economy”.

This part, of mentioning the US/NATO-EU and the Russian Federation standing points is of particular importance for this study because preferences are the driving force of game models, expressing the objectives of the players. Given the fact that we cannot know the true motivations of the actors, as I have already mentioned, the numerous strategic documents and public statements of the main political factors contributed to the process of shaping an appropriate image of reality. Even if the parts analysing the two categories of *mixed-motive games* and *zero-sum games* are of a great importance, this stage comes to lay a foundation for everything else.

#### 4. ZERO-SUM GAMES CATEGORY

As I mentioned before a *zero-sum game* is “[...] one in which the payoffs of the two players always add up to zero, no matter what strategy vector is played; that is, for all strategies  $s_1$  and  $s_2$ ,  $p_1(s_1, s_2) + p_2(s_1, s_2) = 0$ ” (Dutta 1999, 139). Within this typology we find games as chess, cards and many others, in which there can only be one winner, a situation known as *pareto-efficiency*, where “[...] the lot of one player cannot be improved without worsening the lot of at least one other player” (Kelly 2003, 77).

It is important to mention that this kind of game “[...] obeys a law of conservation of utility value, where utility value is never created or destroyed, only transferred from one player to another” (Kelly 2003, 77).

*Zero-sum games* can be played a finite or an infinite number of times, but my attention will be focused on the first category. “*Finite zero-sum games* are those in which both players have a finite number of pure strategies” (Kelly 2003, 78) and *infinite zero-sum games* “[...] are those in which at least one player has an infinite number of pure strategies from which to choose and are thankfully fairly rare.

Only some infinite games have solutions, but all finite ones do" (Kelly 2003, 78). For *zero-sum games*, a solution "[...] is a specification of the way each of the players should move. If both players move according to this specification, then the pay-off that result is known as the value of the game" (Kelly 2003, 78).

**Table no. 1**

Player 1	Player 2		
	Strategy	Strategy A	Strategy B
	Strategy A	AA	AB
	Strategy B	BA	BB

*Source: A pay-off matrix for a two-person zero-sum game. (Kelly 2003, 80)*

In a pay-off matrix of a *zero-sum game* we can see a lot of strategies (the rows coincide with a pure strategy for player 1 and the columns are the equivalent for player 2. At the intersection between a row and a column we find the pay-off for the player 1. The second player's pay-offs are the negatives of those included on the matrix), but a player must select the optimal one. One way of doing that is by applying the *maximin strategy*. If one tries to define this concept, will sound as follows: "[...] a maximin strategy of player 1 maximizes the minimal (with respect to player 2's strategies) payoff of player 1, and a minimax strategy of player 2 minimizes the maximum (with respect to player 1's strategies) that player 2 has to pay to player 1" (Hans 2008, 22).

If in a game the first player's strategy (*maximin*) coincides with the second player's (*minimax*) we have a *saddle or equilibrium point*, "[...] which represents the pay-off that results from best play by both players. The players can only do worse, never better, by selecting anything other than the optimal *saddle point strategy* – it is the outcome that minimizes both players regret" (Kelly 2003, 80). Regarding this concept I have to specify that "Sometimes saddle points are unique and there is only one for the game. Other times there is no saddle point or there are multiple ones" (Kelly 2003, 81).

#### 4.1. Ukraine as a *zero-sum game*

Before exploring the concept of *zero-sum games*, often invoked in the public space, with reference to the situation between Russia and the West, I will dissect, in the first instance the moment of 2014, when Crimea and Sevastopol were annexed.

It is important to have in mind the beginning of the Ukrainian crisis, when Viktor Yanukovich decided to renounce the agreement with the European Union in order to strengthen the ties with Russia. This event led to massive protests which culminated, in February 2014, when at least 88 people were killed in 48 hours in Kiev (Ukraine in 48-hour ultimatum to east's pro-Russia activists 2014). After that, the Ukrainian president fled to Russia, the protesters took control of the government buildings and the Parliament voted to remove Yanukovich from power and to organize new elections.

The Kremlin leadership saw an opportunity, and on February 27<sup>th</sup> and 28<sup>th</sup>, pro-Russians seized important buildings in the Crimean capital, Simferopol, and within days they organized a referendum in which 97 percent (Official results 2014) of the voters expressed their will to join the Russian Federation. The annexation was not the last moment in the Ukrainian crisis because after that the troubles spread eastwards (a series of pro-Russian demonstrations took place across south-eastern Ukraine and led to an armed conflict between the Ukrainian government and the separatist forces, which culminated in Donetsk and Luhansk declaring their independence, thus affecting the stability of Ukraine). As a known fact, the current situation is still very difficult even though we have a ceasefire agreement.

Mentioning the players' positions, one can say, at a first glance, that the views of the two camps concerning Ukraine, are opposed. Applying the logic of *zero-sum games*, when a party wins, the other must lose. In this specific case, in the events of 2014, Russia was the winning side.

If we were to use *maximin strategy* for the Kremlin, it means they had the following manner of thinking: "[...] I watch each strategy and determine which is the worst possible outcome. Then I compare these results and I choose the least bad result" (Miroiu 2007, 7). In the context of the events of 2014 and the possibility of losing Ukraine to the European and the Atlantic structures, the



“least bad” strategy for Moscow was to intervene in order to annex Crimea. This was their way to show the European structures that, on the one hand, Ukraine is still important for Moscow’s politics, and on the other, the situation in this country is far from being a clear one.

After a close read of the above-mentioned official documents, I consider that the main purpose of the Kremlin was to keep Ukraine away from NATO and the EU, and to attract it to Russia’s projects, such as the Eurasian Economic Union. In this process, the Russian researcher, Dmitri Trenin (2014a, 6-7) talks about two central objectives: “The first was to make Crimea off limits to the new post-Yanukovich authorities in Kiev [...] Moscow’s second objective was to achieve a new federal settlement in Ukraine, which would forestall complete domination of the country by Kiev and western Ukraine and thus make and move toward NATO structurally impossible”. If we follow the arguments above, and agree Russia tried to make Ukraine undesirable for the EU – NATO, then we can understand the objectives proposed by Trenin.

If we refer to the main objective, it must be said that, by annexing Crimea, the Russian Federation “[...] has made a big step toward restoring its dominance in the Black Sea area [...] Russia now occupies the strategically strongest position in the area. The Russian Black Sea Fleet, with Sevastopol as its main base, will now grow and modernize faster, which will enhance Moscow’s capability to project power, including to the Eastern Mediterranean” (Trenin 2014a, 15). This affects the hierarchy of the Black Sea fleets. After the collapse of the Soviet Union, Turkey’s fleet (a NATO member country) was the most important one in the region. Thus, the annexation of Crimea made Russia an important player again.

The second objective is that “The leadership in Moscow is well aware that countries marred by ethnic conflicts and unresolved territorial disputes cannot, according to NATO’s rulebook, join the western security alliance” (Götz 2015, 7). This argument can also be seen by using the concept of *buffer zones*, category defined by Oxford Dictionaries as “a neutral area serving to separate hostile forces or nations” (Buffer zones n.d.). Obtaining such areas “[...] can be reached by creating frozen, or what would be frozen, conflicts [...]” (Matsaberidze 2015, 81). In the case of Ukraine, it can be said that this was achieved after the Kremlin supported the separatist tensions in the east.

The annexation was a strong statement for the leadership in Kiev and for the West, portraying the Moscow administration as a fearless player, who would be able to do anything for protecting its interests and in the same time, “Russia has raised fundamental questions about the principles of the European order [...] Russia wants to both restore and re-legitimize spheres of influence as an organizing principle of European order” (Buras et al. 2014).

Another important thing won by the Russian Federation after the intervention in Ukraine is that these actions “[...] made the Kremlin increasingly seek recognition on its own terms from other non-western powers (e.g. the other BRICS)” (Nitoiu 2016, 151). This could contribute substantially to the future position of the Russian state on the international stage.

In the case of the fight for Ukraine if we assume that the *maximin strategy* of the two players coincide, we can catalogue the present Ukrainian situation as being a *saddle point*. If the Russian Federation or the West had chosen anything else than the *optimal saddle point strategy* (which means, that both subjects done their best), they would have lost much more. However, this strategy, in which every player did everything they could, should be seen differently from a subject to the other. Russia assumed several significant risks, disrespecting the norms of international law and international conventions, while the West acted through the institutions they have, in a more reserved manner.

The *zero-sum games* category might provide some relevant information about the events from 2014, but there are still numerous elements which remain unsolved by this type of approach. As mentioned before, the interests of the two actors in the *zero-sum games* are opposed. If one wins, the other loses; there is no other option (but in reality the interests of the two players, as we will see in what follows, are not totally opposed nor coincident). This is the reason why neither a *zero-sum game*, nor an *infinite zero-sum game* might be applied here (as explained above, they are a part of the same theory, so they will lead to similar results), because of the richer offer of the next category. But, for example, one could ask what happens if the dispute for Ukraine is an *infinite zero-sum game*, as only some infinite games have solutions, the others remain unsolved, and this can be – at least for the moment – said also about the dispute between the Russian

Federation and the West, because this conflict is not over. Therefore, another part of *Game Theory* could be applied.

Furthermore, I will explore the *mixed-motive games* category.

## 5. MIXED-MOTIVE GAMES CATEGORY

The second category of games I chose to use for this article could be defined as the area of a sensitive balance between cooperation and conflict and is named *mixed-motive games*. Like in the case of *zero-sum games*, I will refer only at the elements which define this concept. I do not intend to create an exhaustive list of the diverse games, strategies, and equilibria this category includes, as this is not the purpose of this paper.

Although at the beginning of its development, *Game Theory* was primarily focused on *zero-sum games*, around the 1960s, Thomas Schelling drew attention on *nonzero-sum games*. In his opinion, the *zero-sum games* are the exception, whereas the *nonzero-sum games* are more likely to show significant results. If a *zero-sum game* offers a narrow variety of solutions, in the case of *nonzero-sum games*, the variety of solutions is much broader. Therefore, Schelling (1960, 1980, 4) emphasized that “Pure conflict, in which the interests of two antagonists are completely opposed, is a special case”. From this moment on, *mixed-motive games* have received a special attention from many researchers, policy makers and others. Around 1970, Anatol Rapoport wrote, “It seems to me that the real value of game theory [...] lies in the subsequent development of the theory beyond the context of the two person constant sum game” (Rapoport’s work as cited in Robinson and Goforth 2005, 4).

Like in the case of *zero-sum games*, games with *mixed-motive* can be played a finite or infinite number of times. The way of playing them will lead to the existence of different strategies and manners of solving the game. Amongst the most well-known and used games are: the prisoner’s dilemma, the leader, the battle of the sexes, chicken. This type of games can have one or more *Nash equilibria*, but there are situations without a unique *Nash equilibrium* point. A *Nash equilibrium* “[...] is a unique pair of strategies from which neither player has an incentive to deviate

since, given what the other player has chosen, the Nash equilibrium is optimal” (Kelly 2003, 101).

What is important to mention regarding *mixed-motive games* is that “[...] the sum of the pay-off differs from strategy to strategy, so they are sometimes called variable-sum games [...] They rarely produce pure solutions, but they are interesting for the real-life situations they represent and for providing an insight into the nature of conflict resolution” (Kelly 2003, 98).

As we can see in Table no.2, *mixed-motive games* are just slightly different from *zero-sum games*. Player 1 (row) has a finite number of strategies, exactly as the player 2 (column) and the pay-offs for both players are exemplified through the utility functions  $u_1$  and  $u_2$ , but as I mentioned above, in the case of *mixed-motive games*, what one player gains it is not necessarily what the other loses, like in the situation of *zero-sum games*.

**Table no. 2**

	Player 2		
	Strategy	$c_1$	$C_2$
Player 1	$r_1$	$u_1(r_1, c_1),$ $u_2(r_1, c_1)$	$u_1(r_1, c_2),$ $u_2(r_1, c_2)$
	$r_2$	$u_1(r_2, c_1),$ $u_2(r_2, c_1)$	$u_1(r_2, c_2),$ $u_2(r_2, c_2)$

Source: A mixed-motive game with two players. (Kelly 2003, 100)

### 5.1. Moscow's foreign affairs approach after Crimea

As we have seen, the events from Ukraine (the annexation of Crimea) can be understood through a *zero-sum game*. However, the reality is more complex than that. The *zero-sum category* can capture a series of extremely expressive elements of the international stage, but even if the actors of the international context may find themselves in situations of competition on certain topics, they may also have common positions on others. Most often their interests are somewhere in between. A good example is the fact that, even if in the case of Ukraine, Russia and the West wanted different/opposite things, it is obvious that in this fight for "common neighbourhood", neither one of the actors wanted to launch a war (it is useful to mention here the mutually assured destruction possibility, even if it can be seen as *ultima ratio*). In Mark Galeotti's<sup>1</sup> (2016) words, "[...] while Russia is clearly mounting a much more aggressive challenge to western will and morale, and indeed the credibility of the international legal and political order, this does not translate into a willingness to start a war it could not possibly win".

To consider the Russian Federation's foreign policy, regarding the West, in the fight for Ukraine as being a *finite zero-sum game*, it means that in the future interactions, Moscow will see the reality in the same thick and simplistic shades, and it will use the *maximin strategy*.

From my point of view such a perception is not feasible and in what follows I will explore the results of the events from 2014.

Amongst the European Union's actions post-Crimea we can find:

*"[...] the EU-Russia Summit was cancelled; instead of the G8 summit in Sochi, a G7 meeting was held in Brussels in 2014; EU countries supported the suspension of negotiations over Russia's joining the OECD and the International Energy Agency; 152 people and 37 entities are subject to an asset freeze and a travel ban over their responsibility for actions which undermine or threaten the territorial integrity,*

---

<sup>1</sup> Senior research fellow at the Institute of International Relations Prague; coordinator of the Centre for European Security and principal director of the Mayak Intelligence consultancy.

*sovereignty and independence of Ukraine; the Council imposed substantial restrictions on economic relations with Crimea and Sevastopol; a full ban on investment has been in place since December 2014, along with a prohibition to supply tourism services in Crimea; in July and September 2014, the EU imposed economic sanctions targeting exchanges with Russia in specific economic sectors; restrictions on economic cooperation were introduced by EU leaders in July 2014” (EU restrictive measures in response to the crisis in Ukraine 2017).*

These sanctions led to a prolongation of an already tense situation. From the perspective of the economic dimension, they had a negative impact on the EU as well as on the Russian Federation. For example, before the Ukrainian crisis, in 2013, the EU imports from Russia were over 200 000 million euro and in 2015 were just over 120 000 million euro (European Union, Trade in goods with Russia 2017). This situation must be seen through the case of the Russian Federation which, according to the information from the Russian Federal Statistics Service, “[...] in 2013 EU Member States accounted for 57 percent of Russian exports and 46,5 percent of Russian imports, making the Union by far Russia’s most significant partner” (House of Lords - European Union Committee, The EU and Russia: before and beyond the crisis in Ukraine 2015, 12). Even if the losses are on both sides, as can be seen from the figures mentioned above, the Russian state is the one which lost the most.

Regarding the second player, represented by the US, the Executive Order 13660,

*“[...] signed on March 6, 2014, authorizes sanctions on individuals and entities responsible for violating the sovereignty and territorial integrity of Ukraine, or for stealing the assets of the Ukrainian people” (Ukraine and Russia Sanctions n.d.). On March 20<sup>th</sup>, 2014 a new Executive Order was issued, “Blocking Property of Additional Persons Contributing to the Situation in Ukraine” (Ukraine and Russia Sanctions n.d.). Through the Executive Order 13685, “[...] the United States had steadily increased the diplomatic and financial costs of Russia’s aggressive actions towards Ukraine” (Ukraine and Russia Sanctions n.d.). All these measures were taken, according to the US Department of State, “[...] in close coordination with the EU and international partners” (Ukraine and Russia Sanctions n.d.).*

The wide range of sanctions imposed by the United States of America and the European Union, engaged efforts of the Russian Federation to develop and impose similar counter-sanctions. All of the above, along with other reasons,

such as the drastic decrease of the price of oil and the Kremlin's dependence on the energy sector, led to a situation where, "since April 2014, the rouble has lost nearly half its value, [...] economic growth slowed down to 0.6 percent in late 2014, the lowest since the crisis of 2009. In 2015, Russia officially entered a recession. Between April and June 2015, Russia's GDP contracted by some 5 percent" (Nesvetailova 2016, 114). This negative tendency was present also in 2016, when the GDP contracted just 0.2 percent (International Monetary Fund 2017), but in 2017 the Russian Federation economy stabilized. In the Russia Economic Report available on The World Bank site (The World Bank n.d.), it is emphasized that "Supported by higher oil prices and macro stabilization, the Russian economy returned to modest growth in 2017", reaching according to the IMF (International Monetary Fund 2017) at a *Real GDP Growth* of 1.8 percent. But with all that is important to note that the "[...] growth dynamics were uneven [...] the growth composition of 2017 remains like the pre-crisis one, driven mostly by mineral resource extraction and non-tradable sectors" (The World Bank, n.d.).

All these elements highlight the difficult position in which the Russian Federation is. It is also important to emphasize here the impact of the less direct sanctions on the technological transfer which can be a serious problem for the Kremlin, as one can find that, "[...] in Russia, imported technology prevails over exports, which leads to a negative TBP (technology balance of payments). Only exports of scientific research from Russia exceed imports; all other positions (patents for inventions, design, know-how, etc.) show an inflow of technology from abroad" (Rosstat 2014 as cited in Terebova 2017, 330). The fact that Russia has "[...] a high level of dependence on imports from sanctions-imposing countries" (Gnidchenko et al. 2016, 66) adds up at the already mentioned situation; in the same time, in specific domains, like the energy sector, "[...] there are few viable sources for Russia to acquire advanced technology [...] apart from the United States and Europe" (Weiss and Nephew, 2016). Even if the Moscow administration is more focused on the political-security level, the sanctions imposed by the US and EU (in this tough economic background), and the negative impact on the Russian economy cannot be neglected.

As I underlined in the case of *zero-sum games*, it is more expressive to use infinitely iterated games in describing the fight for Ukraine because the main actors do not know when this dispute will end and we have to take into account that the international system is far more sophisticated and interconnected (the relationship between the Russian state and the West is not limited only to the subject of Ukraine). A useful concept to mention here is “the shadow of the future”, which supports cooperation. This basic concept of *Game Theory* expresses the idea that “[...] the choices made today not only determine the outcome of this move but can also influence the later choices of the players. The future can, therefore, cast a shadow back upon the present and thereby affect the current strategic situation” (Axelrod 1984, 12).

These elements support the argument that the reality can no longer be seen only in terms of *zero-sum games*, and it must be analysed with instruments which are much more expressive. The possibility of cooperation which can be found in the category of *mixed-motive games* is difficult to be achieved but it can bring benefit for both parties.

## 6. CONCLUSIONS

As one was able to see throughout this article, *Game Theory* can provide a series of answers/information extremely useful in understanding the complexity of the international stage, where we find different typologies of actors, interactions, interests, etc. However, the use of *Game Theory* concepts must be done, in my view, in a more nuanced manner.

The perception of the events from 2014 through the concept of *zero-sum games* led us to the conclusion that the Russian Federation was the winner in this dispute with the West. But my analysis through the more elaborated theory of *mixed-motive games*, showed that reality is much more complex than this. The Kremlin's success seems to be a pyrrhic victory if we consider the effects of western sanctions on Russia's economy and Ukraine's foreign and security policy trajectory after the events of 2014. These can be described, with the obvious limits, as being closer to the western camp [on August 1<sup>st</sup>, 2017 entered into force



The Canada-Ukraine Free Trade Agreement/CUFTA (Government of Canada, 2017); in 2014, the Ukrainian parliament renounced at the non-aligned status of the country, expressing the objective to join NATO (“Ukrainian parliament angers Moscow by scrapping ‘non-aligned’ status” 2014); on March 21<sup>st</sup> and on June 27<sup>th</sup>, 2014 an Association Agreement was signed, including a Deep and Comprehensive Free Trade Area/DCFTA between the EU and Ukraine, which entered into force on September 1<sup>st</sup>, 2017 (“EU-Ukraine relations, factsheet”, 2017)].

Definitely, the category of *mixed-motive games* is able to raise a lot of questions and options of analysing the interaction from the international environment, offering, from my point of view, multiple layers of understanding for future research projects. This is the reason why I consider this type of games more appropriate to be used not only in the final stage, of analysing disputes, but also in the beginning, in the phase of creation and strategy development.

In the end, I consider of a great importance to mention what Ariel Rubinstein (1991, 919) said about *Game Theory*: “Modelling requires intuition, common sense, and empirical data in order to determine the relevant factors entering into the players’ strategic considerations and should thus be included in the model. This requirement makes the application of game theory more an art than a mechanical algorithm”.

## REFERENCES

- Axelrod, Robert. 1984. *The Evolution of Cooperation*. USA: Basic Books Inc.
- Barron, N. Emmanuel. 2008. *Game Theory: An Introduction*. New Jersey: John Wiley and Sons.
- Buras, Piotr. Dworkin, Anthony. Godement, Francois. Levy, Daniel. Leonard, Mark. Liik, Kadri. 2014 (June 16). “Ten Global consequences of the Ukraine crisis.” *European Council on Foreign Relations*. accessed December 18, 2017. [http://www.ecfr.eu/article/commentary\\_ten\\_global\\_consequences\\_of\\_ukraine272](http://www.ecfr.eu/article/commentary_ten_global_consequences_of_ukraine272).
- Dutta, K. Prajit. 1999. *Strategies and Games: Theory and Practice*. USA: MIT Press.

- Felgenhauer, Pavel. 2017 (September 28). "Syrian War and the Return of Zero-Sum Thinking in Russian-US relations." *Jamestown*. accessed September 10, 2018. <https://jamestown.org/program/syrian-war-and-the-return-of-zero-sum-thinking-in-russian-us-relations/>.
- Finus, Moshe. 2001. *Game Theory and International Environmental Cooperation*. UK: Edward Elgar Publishing.
- Galeotti, M. 2016 (June 21). "No, Russia is not preparing for all-out war." *OpenDemocracy*. accessed February 8, 2018. <https://www.opendemocracy.net/od-russia/mark-galeotti/no-russia-is-not-preparing-for-all-out-war>.
- Gnidchenko, Andrey. Mogilat, Anastasia. Mikheeva, Olga. Salnikov, Vladimir. 2016. "Foreign Technology Transfer: An Assessment of Russia's Economic Dependence on High-Tech Imports." *Foresight and STI Governance* 10, no.1: 53-67.
- Götz, Elias. 2015. "It's geopolitics, stupid: explaining Russia's Ukraine policy." *Global Affairs* 1, no.1(January): 3-10.
- Government of Canada. 2017. "Canada and Ukraine: Creating jobs and opportunities together. United in Building a Prosperous and Secure Future." accessed February 3, 2018. <http://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/ukraine/canada-ukraine.aspx?lang=eng>.
- Hans, Peters. 2008. *Game Theory. A Multi-Levelled Approach*. Berlin: Springer.
- Hill, Fiona. and Gaddy, G. Clifford. 2013. *Mr. Putin. Operative in The Kremlin*. Washington D.C.: The Brookings Institution.
- House of Lords, European Union Committee. 2015 (February 20). "The EU and Russia: before and beyond the crisis in Ukraine. 6th Report of Session 2014-15." accessed December 20, 2017. <http://www.publications.parliament.uk/pa/ld201415/ldselect/ldeucom/15/115.pdf>.
- Huang, Qiming. 2010. *Game Theory*. Croatia: Sciyo.
- International Monetary Fund. (2017) "Real GDP growth. Annual percent change." accessed February 14, 2018. [http://www.imf.org/external/datamapper/NGDP\\_RPCH@WEO/EEQ/RUS](http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/EEQ/RUS).
- Kelly, Anthony. 2003. *Decision Making using Game Theory*. Cambridge: Cambridge University Press.

- Matsaberidze, David. 2015. "Russia vs. EU/US through Georgia and Ukraine." *Conexions: The Quarterly Journal* 14, no. 2(Spring): 77-86.
- Miroiu, Adrian. 2007. *Fundamentele Politicii. Volumul II: Raționalitate și acțiune colectivă*. Iași: Polirom.
- Mogherini, Federica. 2018. "Remarks by High Representative/Vice-President Federica Mogherini at the joint press point with Mr. Volodymyr Groysman, Prime Minister of Ukraine." accessed June 6, 2018. [https://eeas.europa.eu/headquarters/headquarters-homepage/41162/remarks-high-representativevice-president-federica-mogherini-joint-press-point-mr-volodymyr\\_en](https://eeas.europa.eu/headquarters/headquarters-homepage/41162/remarks-high-representativevice-president-federica-mogherini-joint-press-point-mr-volodymyr_en).
- Mowatt-Larsen, Rolf. 2016 (October 17). "The Strategic Balance: A new US-Russian Zero Sum Game." accessed December 2, 2017. <https://www.justsecurity.org/33635/strategic-balance-u-s-russian-sum-game/>.
- Munck, Gerardo. L. 2001. "Game theory and comparative politics: New perspectives and old concerns" *World Politics* 53, no.2 (December): 173-204.
- Nesvetailova, Anastasia. 2016. "Against all odds? Russia's Financial Crisis and Global Geopolitics." *The International Spectator* 51, no.1(April): 113-130.
- Nitoiu, Cristian. 2016. "Russia and the EU's quest for status: the path to conflict in the post-Soviet space." *Global Affairs* 2, no.2(May): 143-153.
- Putin, Vladimir. 2014 (March 18). "Address by President of the Russian Federation." accessed June 5, 2018. <http://en.kremlin.ru/events/president/news/20603>.
- Robinson, D.R. and Goforth, D.J. 2005 (April 28). "Conflict, No Conflict, Common Interests, and Mixed Interest in 2 X 2 Games." <http://economics.ca/2005/papers/0518.pdf> (accessed December 12, 2017).
- Romp, Graham. 1997. *Game Theory. Introduction and Applications*. New York: Oxford University Press.
- Rubinstein, Ariel. 1991. "Comments on the interpretation of game theory." *Econometrica: Journal of the Econometric Society* 59, no.4 (July): 909-924.
- Schelling, C. Thomas. 1960, 1980. *The Strategy of Conflict*. USA: Harvard University Press.
- Stoltenberg, Jens. 2017 (December 19). "Adapting NATO in an Unpredictable World." accessed June 7, 2018. [https://www.nato.int/cps/en/natohq/opinions\\_150337.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/opinions_150337.htm?selectedLocale=en)).

- Terebova, S. V. 2017. "Cooperation between Russia and the European Union: From Importing to Exporting Technology." *Studies on Russian Economic Development* 28, no.3 (May): 327-337.
- Trenin, Dmitri. 2014a (July). "The Ukraine crisis and the resumption of great-power rivalry." accessed November 25, 2017. [http://carnegieendowment.org/files/ukraine\\_great\\_power\\_rivalry2014.pdf](http://carnegieendowment.org/files/ukraine_great_power_rivalry2014.pdf).
- Trenin, Dmitri. 2014b (December 29). "Russia's New Military Doctrine Tells it All." *Carnegie*. accessed November 10, 2017. <http://carnegie.ru/2014/12/29/2014-russia-s-new-military-doctrine-tells-it-all/ijtl>.
- Tsygankov, Andrei. P. 2012. *Russian and the West from Alexander to Putin*. New York: Cambridge University Press.
- Tusk, Donald. 2017. "Remarks by President Donald Tusk following the EU-Ukraine summit in Kyiv." accessed June 6, 2018. <http://www.consilium.europa.eu/en/press/press-releases/2017/07/13/tusk-remarks-summit-ukraine-kyiv/>.
- Weiss, S. Andrew. Nephew, Richard. 2016 (July 11). "The Role of Sanctions in U.S.-Russian Relations." accessed October 23, 2018. <http://carnegieendowment.org/2016/07/11/role-of-sanctions-in-u.s.-russian-relations-pub-64056>.
- World Bank. (n.d.). "Russia Economic Report." accessed February 10, 2018 <http://www.worldbank.org/en/country/russia/publication/rer>.
- "Buffer zone definition." accessed December 15, 2017, [https://en.oxforddictionaries.com/definition/buffer\\_zone](https://en.oxforddictionaries.com/definition/buffer_zone).
- "Communication from the Commission - European Neighbourhood Policy - Strategy paper, COM 0373 final." 2004. accessed November 16, 2017. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52004DC0373>.
- "Concept of The Foreign Policy of The Russian Federation." 2013 (February 12). accessed November 20, 2017. [http://www.mid.ru/en/foreign\\_policy/official\\_documents//asset\\_publisher/CptlCk6BZ29/content/id/122186](http://www.mid.ru/en/foreign_policy/official_documents//asset_publisher/CptlCk6BZ29/content/id/122186).
- "Direct Line with Vladimir Putin." 2014 (April 17). accessed June 7, 2018. <http://en.kremlin.ru/events/president/news/20796>.
- "EU restrictive measures in response to the crisis in Ukraine." 2017 (December 22), accessed February 12, 2018. <http://www.consilium.europa.eu/en/policies/sanctions/ukraine-crisis/>.

- “European Union, Trade in goods with Russia.” 2017 (November 4). accessed February 2, 2018. [http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc\\_113440.pdf](http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113440.pdf).
- “EU-Ukraine relations, factsheet.” 2017. accessed February 9, 2018 [https://eeas.europa.eu/headquarters/headquarters-homepage\\_en/4081/%20EU-Ukraine%20relations,%20factsheet](https://eeas.europa.eu/headquarters/headquarters-homepage_en/4081/%20EU-Ukraine%20relations,%20factsheet).
- “Joint Communication to The European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions – Review of the European Neighbourhood Policy, SWD 500 final.” 2015. accessed June 6, 2018. [http://ec.europa.eu/enlargement/neighbourhood/pdf/key-documents/151118\\_joint-communication\\_review-of-the-enp\\_en.pdf](http://ec.europa.eu/enlargement/neighbourhood/pdf/key-documents/151118_joint-communication_review-of-the-enp_en.pdf).
- “Joint Declaration of the Eastern Partnership Summit.” 2015 (May 21-22). accessed June 6, 2018. <http://www.consilium.europa.eu/media/21526/riga-declaration-220515-final.pdf>.
- “Joint Declaration of the Eastern Partnership Summit.” 2017 (November 24). accessed June 6, 2018. <http://www.consilium.europa.eu/media/31758/final-statement-st14821en17.pdf>.
- “Military Doctrine of The Russian Federation.” 2014 (December 26). accessed December 8, 2017. <http://static.kremlin.ru/media/events/files/41d527556bec8deb3530.pdf>.
- “National Security Strategy of The Russian Federation. 2015” (December 31). accessed November 25, 2017. <http://www.ieee.es/Galerias/fichero/OtrasPublicaciones/Internacional/2016/Russian-National-Security-Strategy-31Dec2015.pdf>.
- “Official results: 97 percent of Crimea voters back joining Russia.” 2014 (March 17). accessed November 16, 2017. <http://www.cbsnews.com/news/official-results-97-of-crimea-voters-back-joining-russia/>.
- “Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization.” 2010 (November 19-20). accessed December 17, 2017. [http://www.nato.int/nato\\_static/assets/pdf/pdf\\_publications/20120214\\_stategic-concept-2010-eng.pdf](http://www.nato.int/nato_static/assets/pdf/pdf_publications/20120214_stategic-concept-2010-eng.pdf).
- “The Foreign Policy Concept of the Russian Federation.” 2016 (November 30). accessed November 20, 2017.

- [http://www.mid.ru/en/foreign\\_policy/official\\_documents/-/asset\\_publisher/CptlCk6BZ29/content/id/2542248](http://www.mid.ru/en/foreign_policy/official_documents/-/asset_publisher/CptlCk6BZ29/content/id/2542248).
- “Ukraine and Russia Sanctions” accessed February 3, 2018. <http://www.state.gov/e/eb/tfs/spi/ukrainerussia>.
  - “Ukraine in 48-hour ultimatum to east’s pro-Russia activists.” 2014 (April 9) accessed November 16, 2017. <https://www.bbc.com/news/world-europe-26953113>.
  - “Ukrainian parliament angers Moscow by scrapping ‘non-aligned’ status.” 2014 (December 23). accessed February 9, 2018. <https://www.reuters.com/article/us-ukraine-crisis-nato/ukrainian-parliament-angers-moscow-by-scrapping-non-aligned-status-idUSKBN0K10OS20141223>.
  - “Wales Summit Declaration”. 2014 (September 5). accessed June 7, 2018. [https://www.nato.int/cps/en/natohq/official\\_texts\\_112964.htm?mode=pressrelease](https://www.nato.int/cps/en/natohq/official_texts_112964.htm?mode=pressrelease).
  - “Warsaw Summit Communiqué.” 2016 (July 8-9). accessed June 7, 2018. [https://www.nato.int/cps/en/natohq/official\\_texts\\_133169.htm?mode=pressrelease](https://www.nato.int/cps/en/natohq/official_texts_133169.htm?mode=pressrelease).