NORTH KOREA NUCLEAR CRISIS; POLICIES AND STRATEGIES

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Abstract. The aim of this paper is to model North Korea and USA relationship since past until now. To this end, we have used game theory. The weakness of the existing models is that they have a static nature and can't analyze the changes of processes, strategies and results. The dynamic system of strategic games of which we have used in this article is a proper method to solve this problem. We have shown that South Korea and China play an important role in resolving the crisis.

1. Introduction

The crisis of Korea has become one of the oldest crises of the current international system. Division of Korea peninsula into two separate countries of North Korea and South Korea originated from victory of Allies in the World War II in 1945 and the end of 35 years Japanese dominance on Korea. America and Soviet Union agreed to take the country's temporary guardianship from the 38 degree circuit location. The aim of the guardianship plan helpped to establish a temporary Korean government that was established in the due time independently and freely. Although the date of election had been determined, the Soviet refused to cooperate with United Nation Organization plans to hold a public and free election in the two Koreas. As a result, a communist government under Soviet support in the north and pro-western government was formed in the south. Two separate governments that each one claimed ruling on the whole peninsula despite the termination of cold war in 1990s; but still some regions inherited the 45 years tense period. Perhaps there isn't any nation like North Korea that is still engaged with security issues left behind from that period; an era that its most important aspect was formation of alignments

based on a camp loyalties (east and west) accompanied with weapons competitions. Today, North Korea nuclear crisis is the most security concern of the far-east region countries. Pyongyang made two atomic experiments in 2006 and 2009 whereby was recognized as a new member of nuclear club. Again, despite the USA threats and resolutions of Security Council of United Nations in January 6, 2016, for hydrogen bomb experiment and disregarding the world community (even denouncing this action by China and Russia) by test of long-range missiles, put a satellite, successfully on the earth circuit [1]. This situation is significant from several aspects. Since the cease fire agreement in 1953, crisis in the peninsula has continued by severity and weakness. Both parties have threatened each other frequently, America and its allies frequently have unilateral, multilateral and international sanctions with North Korea. The two parties frequently have negotiated in the form of six-party negotiations before United Nations. North Korea frequently has tested its conventional and unconventional weapons. But not only these tensions haven't ended but also increased unprecedentedly after UN taking power and then Trump. But the question is that what has changed in the Korea crisis that has extended it as such and resulted in a situation that media inform of start of an imminent ruinous war? This issue and also the reasons of turning North Korea to develop atomic weapon and the reasons of the crisis expansion are issues which have attracted many researchers and analysts attention in the international behavior area. Researchers in their learning and investigations are like travelers of a sea ship who are commuting among islands of theories. Islands whose only connection aspect is their common presence in the great international behavior ocean. Some theorists are just are permanent residents of an island. Some others continue commuting among the islands. Only a few of them attempt to make a bridge among the islands. Possibly it is due to the islands are seemed too far from each other [2]. By this view, different theories can be used to study the international changes. Therefore, limitation just to a single island has to be avoided. In this study, the game theory framework has been preferred. In 1950s, game theory entered in politics and international relations. Researchers found that this theory is applicable in many events such as international crises that are typically based on role playing of two players or if the game is multilateral, the role of two players is more prominent. So researchers of politics and international relations became determined to develop this theory. Entering the game theory into politics and international relations must be considered a long with a process that

is related to entering the behaviorism approach into the above areas [8]. Neverthe-
less, in the 20th century Carl Von Neumann and Edvard Morgenstern by presetting
the "mini-max" strategy invented a method which had a more potential to analyze
mutual relations [9]. According to this strategy, governments are assumed rational
players who engage in calculating their loss and gain in the international relations
game. International system setting is treated like an economic market in which po-
litical units follow their own benefits. Every strategy (decision) that one party of
the game adopts is by the aim of maximizing benefits and minimizing threats. Of
course, the strategy chosen by each player has a close relationship with the other
party's strategy. This impression is important to understood for the changes in in-
ternational system and also in the Korea peninsula. In the North Korea crisis there
are several players including China, Russia and South Korea, but the role of two
players, namely, American and North Korea is much bolder. Therefore, the study
of both countries' behavior is very significant. Since the issue of atomic activities of
North Korea attracted the global attention as a crisis, strategies and anti-strategies
were adopted from the two countries that finally resulted in production of atomic
weapon by the North Korea. Consequently, the US also initiated to cut financial as-
sistance to North Korea and exercise extensive sanctions against this country within
the Security Council framework. By this reason, both countries' strategies have fluc-
tuated between compromising and a hard position. In the following, we are going
to examine and analyze these strategies since the cold war era up to now.

2. Dynamic System of Strategic Games

We consider strategic 2×2 games with perfect information.

Definition 2.1. If a game produces other games, it is called a *game-maker game.*
In general, if the games $g_1, g_2, ..., g_n$ generate games
$g_1^{'}, g_2^{'}, ..., g_n^{'}$, then g_i- and $g_i^{'}$-s are called *producer* and *produced*, respectively. We call
the form of displaying game-maker games as dynamic system of strategic games [3].

Definition 2.2. If a game creates one or more strategies, it will be called *strategy-
maker game.* The produced strategies can be dominant strategy, dominated strategy,
weakly dominant strategy and weakly dominated strategy. If a game doesn't gener-
ate any strategy, the game isn't strategy maker. If a game with n players is strategy
maker for k players $(0 \le k \le n)$, it is called *strategy maker game of order* (n, k) [5].

In a strategic game with ordinal preferences, players action $a_i^{''}$ strictly dominates her action $a_i^{'}$ if

$$u_i(a^{''}, a_{-i}) > u_i(a_i^{'}, a_{-i}) \quad for \quad every \quad a_{-i} \in A_{-i},$$

where u_i is a payoff function that represents players preferences [5]. If for player i the action $a_i^{''}$ is preferred to action $a_i^{'}$ per every choice of action of other players, it is called dominant strategy and is shown by S_i^j, where S_i^j shows j-th strategy of i-th player. In a strategic game with ordinal preferences, players action $a^{''}$ weakly dominates her action $a_i^{'}$ if

$$u_i(a^{''}, a_{-i}) \geq u_i(a_i^{'}, a_{-i}) \quad for \quad every \quad a_{-i} \in A_{-i},$$

and

$$u_i(a^{''}, a_{-i}) > u_i(a_i^{'}, a_{-i}) \quad for \quad some \quad a_{-i} \in A_{-i}.$$

If for player i the action $a_i^{''}$ is preferred over action $a_i^{'}$ for each action choice of other players, it is called weakly dominant strategy and will be represented by S_i^j [5].

Definition 2.3. A pair of actions is called rational if at least holds true in one of the following conditions:

- would be Nash equilibrium,
- pair of actions, would be Pareto dominant for both players over other pairs of actions,
- for each game that is strategy maker of order $(2, 1)$, pairs of rational actions for one player are responses to dominant strategy or weakly dominant strategy produced for other players.

In a strategy maker game of order $(2, 2)$ where both players have dominant strategy and the game doesn't have Pareto action pairs over Nash equilibrium, the Nash equilibrium of game is the only rational actions pair [3].

Definition 2.4. Dynamic system of strategic games is a model to examine interaction between decision makers more exactly. Every decision maker is a player in this model. To describe this system, we use the games graph. In each node of graph, there is a strategic game with perfect information in which players can make decisions. Each node of this graph can be generator of the next game through the two following methods and is connected to it:

- strategies,
- pair of rational actions.

Players to move from one node to another nod proceed by selecting strategy or pair of rational actions. Graph $\mathbf{G}$ is binary of (G,M) that first coordinate, $g_1, g_2, ..., g_n$, is a finite set of nodes that each node of this graph is a strategic game. The second coordinate is a finite set named edges that edges of this graph are produced strategies or pair of rational actions.

Set of all strategies produced by k-th game is represented by $_k\mathcal{S} = {}_k\mathcal{S}_1 \cup {}_k\mathcal{S}_2 \cup \emptyset$. Set of all pairs of actions Players' in k-th game is shown with $_k\mathcal{A} ={}_k A_1 \cup_k A_2$. Set of all pairs of rational actions for player i is shown with $_k A_i'$ that is a subset of $_k\mathcal{A}$, for all $k \in \{1, 2, ..., n\}$.

Let $\mathcal{A} ={}_1 \mathcal{A} \cup_2 \mathcal{A} \cup ... \cup_n \mathcal{A} \cup \emptyset$ and $\mathcal{S} ={}_1 \mathcal{S} \cup_2 \mathcal{S} \cup ... \cup_n \mathcal{S}$ be two sets. The set valued functions, rational actions pair $\phi_i' : G \to \mathcal{A}$ and strategy maker $\phi_i : G \to \mathcal{S}$ for players are defined as follows:

$$\phi_i'(g_k) ={}_k \mathcal{A}_i' = \left\{ \begin{array}{c} \{(_k a_{i,k}\, a_{-i})_i | (_k a_{i,k}\, a_{-i})_i \in_k \mathcal{A}\} \ \ if \ \ g_k \ \ has \\ pair \ \ of \ \ rational \ \ actions \\ \emptyset \ \ if \ \ g_k \ \ hasn't \ \ pair \ \ of \ \ rational \ \ actions, \end{array} \right.$$

and

$$\phi_i(g_k) ={}_k \mathcal{S}_i = \left\{ \begin{array}{c} \{_k S_i^j |_k S_i^j \in_k \mathcal{S}\} \ \ if \ \ g_k \ \ isa \ \ strategy \ \ maker \\ for \ \ player \ \ i \\ \emptyset \ \ if \ \ g_k \ \ is'nta \ \ strategy \ \ maker \ \ for \ \ player \ \ i, \end{array} \right.$$

for all $i \in N$ and $j, k \in I = \{1, 2, ..., n\}$, where g_k shows k-th game, $(_k a_{i,k}\, a_{-i})_i$ shows rational actions pair of i-th player from k-th game and $_k S_i^j$ shows j-th strategy of i-th player from k-th game [3]. Every move of system as a member of set M is as follows:

$$M := \left\{ m_k^j \ \ | \ \ m_k^j ={}_k S_i^j \ \ or \ \ m_k^j = (_k a_{i,k}\, a_{-i})_i \ \ or \right.$$
$$m_k^j = (_k a_{i,k}\, a_{-i})_{i,j} \ \ \forall \ \ _k S_i^j \in_k \mathcal{S}_i$$
$$\left. (_k a_{i,k}\, a_{-i})_i \in_k \mathcal{A}_i, \ \ (_k a_{i,k}\, a_{-i})_j \in_k \mathcal{A}_j \right\},$$

where g_k^j shows j-th move of k-th game and $(_k a_{i,k}\, a_{-i})_{i,j}$ shows the pair of rational action selected by players i and j of k-th game. Players' move function $\varphi_i : M \to G^2$ and $\varphi_{i,j} : M \to G^2 \cup \emptyset$ with $\varphi_{i,j}(_k S_i^j) = \emptyset$ is defined as following:

$$\varphi_i(m_k^j) = \left\{ \begin{array}{c} (g_k, g_p) = g_k g_p \ \ if \ \ m_k^j ={}_k S_i^j \\ (g_k, g_q) = g_k g_q \ \ if \ \ m_k^j = (_k a_{i,k}\, a_{-i})_i, \end{array} \right.$$

$$\varphi_{i,j}(m_k^j) = \left\{ \begin{array}{c} (g_k, g_p) = \emptyset \ \ if \ \ m_k^j ={}_k S_i^j \\ (g_k, g_s) = g_k g_s \ \ if \ \ m_k^j = (_k a_{i,k}\, a_{-i})_{i,j}. \end{array} \right.$$

The above function shows by what move and by one or both players, two play nodes have been connected to each other. Consequently, it can be said that in move $m_k^j =_k S_i^j$, nodes g_k and g_p have been connected through the strategy selected by player i to each other. In move $m_k^j = (_k a_{i,k} a_{-i})_i$ the nodes g_k and g_q have been connected by pair of rational action selected by player i to each other. In move $m_k^j = (_k a_{i,k} a_{-i})_{i,j}$ the nodes g_k and g_s have been connected through a pair of rational actions selected by players i and j to each other [3].

Consider that H is a set including all series (finite and infinite) that hold true in the following conditions:

(1) $\emptyset \in H$,
(2) Sequence $\left\{ m_j^i, \{g_k, m_k^i\} \right\}$ for all $i, j, k \in I = \{1, 2, ..., n\}$, is a member of H. Each member of H is called a history and is represented by h,
(3) History $h = \left\{ m_j^i, \{g_k, m_k^i\} \right\}_{i,j,k \in I}$ is called final history if it is infinite or there isn't g_{k+1} that   is a member of h.

The set H is called system history. Preferences of each node of a games system that are exactly the same preferences on the pairs of a strategic game actions are called node preferences or tactical preferences. Preferences on strategies set or set of rational actions pair of a game is called systemic preferences or strategic preferences [3].

Definition 2.5. (Dynamic system of strategic games) A dynamic system of strategic games with perfect information including:

- a set of players,
- for each player, a set of strategies,
- for each player, a set of rational actions pair,
- system history,
- node preferences (tactical preferences) on set of all actions pairs,
- systemic preferences (strategic preferences) on strategies or pairs of rational actions.

In dynamic system of strategic games, players using conditions of producer game and generated strategies and pairs of rational actions decide what move they do along with their benefits and what game they design and where they stand. Also this system allows players to select among strategies and rational actions pair which

result in their most benefits based on their abilities and future conditions using available information, according to their rationality and strategic preferences [3].

Example 2.6. Suppose two countries' relations have entered in Self- Serving game g_1. For more accurate expression, the row player is called player 1 and column player is called player 2. Each player has two actions. Players can choose cooperation action $_1C$ or defect $_1D$. Players by choosing each action obtain a payoff that is shown in Fig. 1. Game g_1 is producer of Stag Hunt game g_2 and Prisoners Dilemma g_3. Using dynamic system of games, we model relations between two countries. The game Nash equilibrium is $(_1C,_1D)$. In this game dominant strategy $_1S_2^2$ for player 2 is defect and dominated strategy $_1S_2^1$ is cooperation. Considering dominant strategy $_1S_2^2$ player 2, produces responses of player 1 to this strategy pair of rational actions. So, pairs of rational actions for player 1 is $(_1C,_1D)_1$ and $(_1C,_1D)_1$. Game g_1 isn't a strategy maker for player 1. Thus, game g_1 is a strategy maker of order $(2,1)$. Based on players being rational, the player 1 chooses pair of rational actions $(_1C,_1D)_1$ and player 2 chooses dominant strategy $_1S_2^2$ to continue the system. In summary strategies, Players' move function and pair of rational actions of game g_1 are as follows:

$$\phi_1(g_1) = {_1}\mathcal{S}_1 = \emptyset,$$
$$\phi_2(g_1) = {_1}\mathcal{S}_2 = \{_1S_2^2\},$$
$$\phi_1'(g_1) = {_1}\mathcal{A}_1' = \{(_1C,_1D)_1, (_1D,_1D)_1\} = \{(3,4),(2,2)\},$$
$$\phi_2'(g_1) = {_1}\mathcal{A}_2' = \{(_1C,_1D)_2\} = \{(3,4)\}.$$

Pair of rational actions $(_1C,_1D)_1$ in game g_1 for player 1 ends to Stag Hunt game g_2. The game Nash equilibria are $(_2C,_2C)$ and $(_2D,_2D)$. Game g_2 isn't a strategy maker for players. Therefore, g_2 is a strategy maker of order $(2,0)$. The players' pair of rational actions are $(_2C,_2C)_{1,2}$ and $(_2D,_2D)_{1,2}$. So each player can select one of the pairs of rational actions to continue the game. Thus,

$$\phi_1(g_2) = {_2}\mathcal{S}_1 = \emptyset,$$
$$\phi_2(g_2) = {_2}\mathcal{S}_2 = \emptyset,$$
$$\phi_1'(g_2) = {_2}\mathcal{A}_1' = \{(_2C,_2C)_1, (_2D,_2D)_1\} = \{4,4),(2,2)\},$$
$$\phi_2'(g_2) = {_2}\mathcal{A}_2' = \{(_2C,_2C)_2, (_2D,_2D)_2\} = \{4,4),(2,2)\}.$$

Strategy $_1S_2^2$ for player 2 in game g_1 ends to Prisoner's Dilemma g_3. In g_3 the dominant strategy $_3S_i^2$ is defect and dominated strategy $_3S_i^1$ is cooperation for two
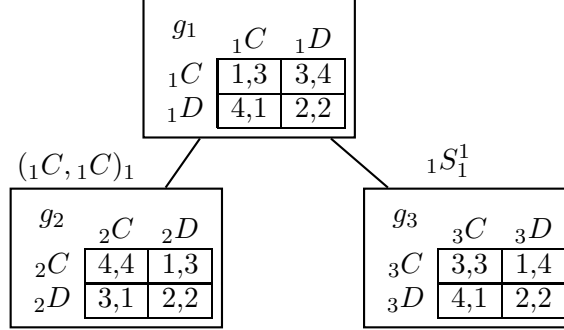
Figure 1. Dynamic system of games for Self- Serving game g_1. This game is producer of Stag Hunt game g_2 and Prisoners Dilemma g_3. Each player has two action $_kC$ or action $_kD$, where $(_kC, _kD)_{i,j}$ shows rational actions pair of players i and j from k-th game and $_kS_i^j$ shows j-th strategy of player i from k-th game.

players. In other words, the Prisoner's Dilemma is a strategy maker game of order $(2,2)$. Nash equilibrium of the game g_3 is $(_3D, _3D)$. Pair of actions $(_3C, _3C)_{1,2}$ is a dominant Pareto compared to pair of actions $(_3D, _3D)$. So pairs of rational actions are $(_3C, _3C)_{1,2}$ and $(_3D, _3D)_{1,2}$. We have

$$\phi_1(g_3) = {_3\mathcal{S}_1} = \{_3S_1^1, {_3S_1^2}\},$$
$$\phi_2(g_3) = {_3\mathcal{S}_2} = \{_3S_2^1, {_3S_2^2}\},$$
$$\phi_1'(g_3) = {_3\mathcal{A}_1'} = \{(_3C, {_3C})_1, (_3D, {_3D})_1\} = \{3,3), (2,2)\},$$
$$\phi_2'(g_3) = {_3\mathcal{A}_2'} = \{(_3C, {_3C})_2, (_3D, {_3D})_2\} = \{3,3), (2,2)\}.$$

Functions of the game move are as follows;

$$\varphi_1(m_1^2) = \varphi_1((_1C, {_1D})_1) = g_1 g_2$$
$$\varphi_2(m_1^1) = \varphi_2(_1S_2^2) = g_1 g_3.$$

The system history is as follows:

$$H = \left\{\emptyset, \left\{g_1, (_1C, {_1D})_1, {_1S_2^2}\right\}, \left\{(_1C, {_1D})_1, \{g_2\}\right\}, \left\{_1S_2^2, \{g_3\}\right\}\right\}.$$

3. Modeling the American and North Korean Game

3.1. Cold War era, collapse of Soviet Union and beginning of the first crisis. America after the Korean war and by excuse of supporting its own allies initiated establishing military bases and deploying thousands of soldiers into the

Korean peninsula. Also, it held extensive shared military maneuvers with Seoul and by presence of thousands of soldiers and advanced military equipment's. Mutually, North Korea also in order to protect its security against America set out nuclear program and produced atomic weapon. In the late of 1970s, North Korea started developing a sample of Scud-B missile made by Soviet by the range of 300 kilometers, and in 1984 tested it. After that, just during 1987-1992, North Korea initiated to enhance the Scud-C model missiles with range of 500 kilometers and produced Rodong I missiles with range of 1300 kilometers, Taepodong 1 missile with range of 2500 kilometers, Musudan I missile with range of 3000 kilometers and Taepodong 2 missile with range of 6700 kilometers. After the end of Cold War and collapse of Soviet Union that was treated as a failure of Marxism ideology, North Korea lost its main supporter. Also many of the economic aids were cut off. Thus, the country's gov- ernment became vulnerable against the internal and external threats. In May 1992, North Korea allowed the inspectors of International Atomicm Energy Agency (IAEA) to visit some of the Yongbyon reactor sites. Several months later, the US intelligence services presented pictures showing North Korea has increased its movements in the Yongbyon and is installed new equipments. Clinton in that point was determined to take the matter to Security Council and make approve new sanctions against North Korea in the Council. Given that North Korea was struggling with famine, the success probability of these sanctions was high. With the actions performed by Clinton's administration, the conditions to put pressure on Pyongyang were provided. But the reaction of North Korea was harsh. Korea threatened to abandon the Non-Proliferation Treaty (NPT). In this point, North Korea adopted a harsh position such that went out of the NPT. As a result of these actions, both countries entered the Prisoners Dilemma game g_1 (Fig. 2). We consider North Korea as row player (player 1) and America as column player (player 2). The players' set of actions include cooperation $_1C$ and defect $_1D$. Players' preferences in this node are the same order preferences of strategic game g_1. In this game both countries have two actions, either terminate tensions in order to achieve more gains and cooperate $_1C$ or not to cooperate $_1D$. This game is a producer of dominant strategy of defect and dominated strategy of cooperation for two players. Thus g_1 is a strategy maker of order $(2,2)$. The game Nash equilibrium is $(_1D,_1 D)_{1,2}$. Pair of actions $(_1C,_1 C)_{1,2}$ is dominant Pareto compared to pair of actions $(_1D,_1 D)_{1,2}$. So, pairs of rational actions for two players are $(_1C,_1 C)_{1,2}$ and $(_1D,_1 D)_{1,2}$. Both countries to continue the game can cooperate by choosing pair of

actions $(_1C, _1C)_{1,2}$ or defect by choosing the dominant strategy of non-cooperation or pair of actions $(_1D, _1D)_{1,2}$.

3.2. 1994 agreement. With the tensions risen up, America's position tended to softness. Jimmy Carter, the USA former president, visited Kim Il-sung, leader of North Korea in June 1994. During the visit, both sides agreed to end the crisis by negotiation. During the negotiations, North Korean leader Kim Il-sung died and his son Kim Jong-il came to power instead. But negotiations didn't stopp and continued. Finally, the USA and North Korea arrived at an agreed framework on October 21, 1994 in Geneva. According to this agreement, North Korea agreed to stop its nuclear program by getting some economic incentives and privileges. Also it allows IAEA inspectors to visit the nuclear facilities of this country. On the other hand, the US agreed to continue economic assistance to North Korea. Such that North Korea during the 1990s had received over four billion dollars economic aids in the form of medicines, fuel and food from the West. The rational action pair $(_1C, _1C)_{1,2}$ of the two countries in game g_1 resulted in Stag Hunt game, g_2. In this game, the US has two actions, either to reduce tensions and control the situation, $_2C$ or follow its rigorous policies, $_2D$. In return, North Korea also has two actions, either uses the occurred opportunity to improve its undesirable situations and submit to the agreement, $_2C$, or continue adhering to its positions and ignore Carter's intercession, $_2D$. Game g_2 is a strategy maker of order $(2, 2)$. The game Nash equilibria and pairs of rational actions for two players are $(_2C, _2C)_{1,2}$ and $(_2D, _2D)_{1,2}$.

3.3. Restoration of tensions. The 1994 agreement despite the intense famine in North Korea remained slightly stable until Bush came to power. Even in September 1999 North Korea announced, at the same time as improving its relations with the US, stops the test of its long-range missiles. Arriving to power in 2002, Bush took a hard stance against North Korea. He condemned North Korea having a secret atomic program. Also, he put the name of North Korea on the list of axis of evil countries and supporter of terrorism. Moreover, he asked the country to answer its conventional weapons situation and human rights. Later, he used the economic assistance as a hostage and its transmission was stopped. The peak of pressure on Pyongyang was when a ship was seized and taken as hostage by the Spanish Navy at the request of the US. These behaviors of United States followed by harsh positions on Pyongyang. North Korea accused the US not to being implement the agreement. Subsequently, it fired the Agency's inspection team. It abandoned NPT

and reopened its nuclear reactor in Yongbyon. The rational action pairs $(_2D, _2D)$ of player 1 in game g_2 resulted in Conflict game g_3. In this game North Korea hase two actions. It adhere to the agreement despite the US violations $_3C$ or break down the agreement contents and resumes its nuclear activities $_3D$. In return, the US also has two actions. It has either to stop putting pressure on the Korea, $_3C$ or continue its hard policies $_3D$. g_3 is a producer of dominant strategy of defect and a dominated strategy of cooperation for two players. Thus, g_3 is a strategy maker of order $(2, 2)$. Nash equilibrium of game and the only pair of rational action for both players is $(_3D, _3D)_{1,2}$.

The United States' rational action pair $(_2D, _2D)$ in game g_2 resulted in Hostage game g_4, in which the US has two actions, either continues the agreement and economic aids $_4C$ or uses its economic and political conditions as hostage in order to put pressure on the Korea and advance its objectives $_4D$. In return, Korea has two actions, either self-control against the US and keep silent $_4C$ or retaliate the US behavior $_4D$. Game g_4 is a producer of dominant strategy of cooperation $_4S_1^1$ and a dominated strategy of defect $_4S_1^2$ for player 1. Also, this game is a producer of dominant strategy of defect $_4S_2^2$ and a dominated strategy of cooperation $_4S_2^1$ for player 2. Therefore, g_4 is a strategy maker of order $(2, 2)$. Pair of rational actions for two players is $(_4C, _4D)_{1,2}$.

3.4. Canceling the agreement. In March 3, 2005 Pyongyang ended the suspension of testing long-range missiles. The reason of this decision was George W. Bush's administration hostile policies. Bush's actions made the atmosphere governing on the two countries relations extremely critical. Suggestion of the evil axis doctrine and the inclusion of the North Korean name and the adoption of preemptive strike strategy (that in fact was a kind of announcing an impending war against any country) made North Korea increasingly worried. Because North Korea was accused of the same cases from the US as Iraq was accused, namely, "attempt to achieve mass destruction weapons" [6]. Communist leaders of the country knew that they had no strategic support. Neither an army nor a powerful ally, nor considerable economic power could have resisted against the US army. In such circumstances, achieving nuclear weapon was considered an unavoidable necessity [7]. Then, the North Korea announced formally that it has succeeded to make atomic weapon. In July 5, 2006, North Korea tested an atomic bomb for the first time. In July 15, 2006, Security Council approved a resolution on request to stop all Ballistic missiles activates. Also

it banned the purchase and sale of raw materials that were used to develop missiles to North Korea. After the resolution approval, in October 9, 2006, North Korea in answer made its first underground nuclear test. Five days later in October 14, 2006, Security Council approved the Resolution no. 1718 on stopping the missile and nuclear tests by North Korea. Finally, 1994 agreement was violated. Relationships between the two countries entered a deadlock and the two countries again engaged in a nuclear crisis [4]. The pair of rational actions $(_3D, _3D)$ of North Korea in game g_3 and dominant strategy $_4S_2^2$ of the US in game g_4 resulted in Deadlock game g_5. In this game, the US has two actions, either abandons putting pressure considering the Korean intense reaction $_5C$ or exercises more pressures and uses international tools like Security council $_5D$. In return, Korea has two actions, either reduces retaliation behavior $_5C$ or intensifies its nuclear activities and through missile tests demonstrates its inhibitive power to US. Moreover, it increase its bargaining power $_5D$. This game is a producer of dominant strategy of defect and a dominated strategy of cooperation for two players. Thus, g_5 is a strategy maker of order$(2, 2)$. The only pair of rational actions is $(_5D, _5D)_{1,2}$.

3.5. Toward re-cooperation. With the intensifying of the nuclear crisis, China tried to bring back the the United States and North Korea again on the negotiation table. In that point there were two problems:

- North Korea wanted that those negotiations had to be held between the US and North Korea. But the US wanted other countries such as China, South Korea, Russia and Japan to enter the negotiations, as well,
- The United States required that before beginning any negotiations, North Korea had to stop its nuclear programs, but North Korea requested that the US first guarantees the country's security.

China, trying to get out of the deadlock, suggested Beijing as the meting place of North Korean and the US leaders. Initially North Korea rejected this suggestion, but after two months of compacted diplomacy, China were able to persuade North Korea to participate in the three-party negotiations in Beijing. In fact, China's objective from the three-party negotiations was a cover for North Korean and the US officials meeting and talks, because China itself didn't participate in this negotiations. This policy was welcomed by the US and North Korea. Finally, with the participation of South Korea and Russia, China also accepts to take responsibility and participate in the negotiations. Analysts believe that one of the main reasons of North Korea

attended in the three-party negotiations was to announce directly to the US that it has not only to be authorized to have nuclear program, but also it has to hold atomic weapon. By the attempts of China and the change of North Korea behavior, the two countries entered in a Biased Cycle game, g_6. In this game North Korea has two actions, either given the occurred opportunity make a spin in its behavior and leave policies generating tension and submit to negotiations $_6C$, or continue to make crisis $_6D$. In return, the US can also proceed to cooperate $_6C$ or non-cooperation $_6D$. g_6 isn't a strategy maker for two players. The pair of rational actions is $(_6C,_6C)_{1,2}$.

The US enthusiasm to participate in the negotiations resulted in Assurance game, g_7. In this game, the US has two actions, either to create a power balance by entering the region countries and also prevent the nuclear development trend by ensuring North Korea to guarantee its security $_7C$ or continue threat and sanctions $_7D$. Mutually, Korea has two actions, considering the US enthusiasm to normalize relationships either utilize the arisen opportunity for economic aids and security guarantee $_7C$, or given the US bad background avoid trusting in this country $_7D$. This game isn't a strategy maker for two players. The players' pair of rational actions are $(_7C,_7C)_{1,2}$ and $(_7D,_7D)_{1,2}$.

3.6. Again agreement in 2007. At this point, China again started its diplomatic efforts, and finally North Korea agreed to take part in the fifth round of six-party talks. Eventually, January 2007 Agreement was signed by the two parties. According to the agreement, the US provided fuel for North Korea and performed the required actions to normalize relationships with the country (such as removing the North Korea's name from the list of terrorist supporter countries). In return, North Korea closed the Yongbyon reactor and took the path of disarmament. Even the dispute on the monies that Pyongyang had in Macau was resolved. The support of the US Navy from the North Korean sailors against the Somali pirates in the waters of the Aden Strait also had a positive impact on this process. Later, North Korea presented its nuclear activities report to the US, and subsequently destroyed the cooling towers of the Yongbyon reactor, which was a symbol of the country's nuclear program. Also, this country accepted re-membership in NPT. The pair of rational actions (C,C) of North Korea and the US respectively in game g_6 and game g_7 resulted in Mixed Harmony game, g_8. In this game the two countries have two actions. Either accepts the agreement to utilize its advantages $_8C$ or resumes the tensions $_8D$. g_8 is a producer of dominant strategy of cooperation and a dominated strategy of defect

for two players. Thus, g_8 is a strategy maker of order $(2, 2)$. The only pair of rational actions is $(_8C,_8C)_{1,2}$.

3.7. Start of the second nuclear crisis In April 9, 2009, North Korea sent its communications satellite by Unha-II missile to space. This was followed by the harsh reaction of the west. The US considered it contrary to the contents of Security Council Resolution 1718. Following this, Security Council supported the US positions to sanction two companies and a bank of North Korea. This wasn't remained without a reply from North Korea; such that entered both parties in the other path of new crisis. Pyongyang called the Security Council action an intolerable insult and a kind of war declaration. Afterwards, it left NPT, fired the Agency inspectors and, according to the country's political authorities, reactivated its all atomic facilities until April 2012. The peak of this period dates back to the atomic test of April, 21 of the same year by North Korea. With the arrival of Barack Obama in the United States, the space did not change, and tensions continued. In 2011, after Kim Jong-il's death, his son Kim Jong-un took over the affairs. He didn't enjoy the experience and charisma his father and grandfather had. So he needed severely to show off himself as a powerful and magnificent leader. Kin Jong-un, at the beginning of his taking power made new movements and even some negotiations had taken place with US. In these negotiations, it was supposed that North Korea shut down its nuclear reactor and instead the US provides the country with food aids. But after a while some tensions occurred in the country's border with South Korea. North Korean military officials have threatened have South Korea and some shootings took place. Finally, the US economic aids also weren't made. The inexperience and economic difficulties made the North Korean young leader try to provide internal solidarity by highlighting the danger of external threats. Moreover, by the nuclear threat of the US and its neighbors, it sent a message to the US that Pyongyang had achieved nuclear weapons and sanctions had be removed. The situations became more severe by Trump taking power. Trump had blamed in his campaigns period the former presidents of US because of military intervention in the west of Asia. Also he had announced that preferred to be US president not the world police. But upon entering into the White House, he and his team adopt other policies. Measures that indicate a tremendous change in the Trump's behavior before and after the presidency; extensive air strike at Syrian Shayrat air force base, the attack by the largest non-atomic bomb to Afghanistan and intensifying tension

with North Korea and increasing the risk of nuclear war in the Korean peninsula. Meanwhile, the issue of the North Korean crisis and that the country is equipped with nuclear weapons, and the presence of China and Russia in the region and in neighborhood has created a particular situation for the crisis that has transformed it from a regional crisis to a full-scale international crisis. North Koreas behavior resulted in Bully game, g_9. In this game, North Korea hase two actions. It either ignores the US violations and adheres to the agreement $_9C$ or by highlighting the external threats provides internal solidarity and also sends the signal to neighbors and the US that Pyongyang had achieved nuclear weapon, so sanctions must be removed $_9D$. In return, the US has two actions. It would ask the region countries such as China to enter in the negotiations to resolve the crisis $_9C$ or initiate a full-scale war to punish Un $_9D$. Game g_9 is a producer of dominant strategy of defect $_9S_1^2$ and dominated strategy of cooperation $_9S_1^1$ for player 1. This game isn't a strategy maker for player 2. Thus, g_9 is a strategy maker of order $(2, 1)$. The only pair of rational actions is $(_9D, _9C)_{1,2}$.

The US policies toward North Korea's behavior resulted in Alibi game, g_{10}. In this game, the US has two actions. Similar to the World War II (that waited until Japan first attacked to Pearl Harbor port to have sufficient excuse to enter the war), it can await the first action of North Korea then initiate military intervention $_{10}D$. In this case it both has a justification for public opinion and take the excuse from China and Russia who will lose severely from the expansion of the crisis in the peninsula. Or it ignores the North Korea's behavior and adheres to the 2007 agreement $_{10}C$. In return, North Korea also has two actions. Either proceeds to cooperate and initiate negotiations and as before seeks to earn privileges and economic incentives in exchange for stopping nuclear activities $_{10}C$ or by creating a limited war demonstrate its determination to begin a full-scale nuclear war, and obtain the required prestige following the probable retreat of the US and its allies while achieving the political and economic advantages $_{10}D$. g_{10} is a producer of dominant strategy of defect $_{10}S_2^2$ and a dominated strategy of cooperation $_{10}S_2^1$ for player 2. This game is a strategy maker of order $(2, 1)$.The game Nash equilibrium is $(_{10}D, _{10}D)_{1,2}$. Pair of actions $(_{10}C, _{10}C)_{1,2}$ is dominant Pareto compared to pair of actions $(_{10}D, _{10}D)_{1,2}$. Therefore, pairs of rational actions for players are $(_{10}C, _{10}C)_{1,2}$ and $(_{10}D, _{10}D)_{1,2}$.

3.8. Reconstructing relations and future prospects. Trump and Kim Jung-un were keeping their stances, and there was no sign of withdrawal from the stances of both sides. Un's beliefs that caused him not to withdraw include:

- North Korea is an Atomic power and has reached the prohibitive stage. Therefore, the US can't attack the country, because it is late for the US to begin other war. North Korea also after the US attack to Syria announced that Pyongyang had the right to follow its nuclear military program. If Syria had nuclear weapon, the US wouldn't have attacked the country,
- The risk of war in terms of extensive mortalities and emergence of human disaster in South Korea and Japan is high and the US never accepts the risk,
- The United States is engaged with numerous economic and political problems. In these circumstances given the multi trillion dollar debt, it isn't able to initiate another war in the region,
- Trump has won the American people's votes by the anti-war slogan and in these conditions banged on the drum of war with an atomic power isn't rational,
- China is a close ally of North Korea. Beijing because of its economic conditions and central role that require stability in the region, never allows the US to attack North Korea.

On the opposite side, Trump and his team probably maintained the following statement that had extended the crisis to a dangerous extent;

- One of the reasons North Korea's leader doesn't care the threats and sanctions is the lack of seriousness of the former presidents of US. If one seriously encounters the UN, he will withdraw certainly,
- If North Korea doesn't resist, resisted, this message will be sent to UN that he can do everything he desires and continues his missile program to the extend that the missiles achieve the capability of targeting the White House. Therefore, the North Korea's crisis has reached to a dangerous stage and has to be resolved forever,
- China, because constitutes 90 percent of the North Korea's economic relations and the both countries political system is communist and are in vicinity of each other, has an extraordinary influence on North Korea and in the critical times certainly will persuade North Korea to withdraw.

Trump considers China as the number one enemy of the US and by intensifying the crisis in the peninsula wants to expand and justify its military presence in the region by the excuse of controlling North Korea and mainly by the aim of harnessing China. Moreover, it can make pressure on Russia, as well. Trump is seeking to consolidate his unity with the regional countries as well as to have China under his control as much as possible. Intensifying pressures on North Korea and Pyongyang's probable withdrawal against Trump or representing Trump serious against the Korean leader send this message to the other US enemies particularly in west of the Asia that Trump is serious in his foreign policy and they have to withdraw and not to endure a cost. Some experts believe that Syria and Afghanistan bombardment also was in order to show the seriousness to North Korea. Some others also believe that the Trump so-called courageous recent measures in foreign policy, such as the attack on Syria and Afghanistan, and now the escalation of pressures on Korea, have been aimed at building national solidarity and strengthening domestic positions following the internal pressures and crises. Also due to China's growing power and the US power reducing, Trump seeks power balance and revive the past role and China's control. The dominant defect strategy of Korea in game g_9 and also the dominant non-cooperation strategy of the US in game g_{10} resulted in Chicken game, g_{11}. In this game, the US has two actions, either to keep its reputation against North Korea's provocative movements encounters seriously and harshly and continues threats and increasing sanctions, and while balancing power in the Western Asia and strengthening internal solidarity and potion, provide the ground to sell weapon and deploying its missiles in the South Korea, Japan and Guam Island ($_{11}D$) or to consider strategic patience ($_{11}C$). In return, North Korea also has two actions. In the absence of a reliable ally after Cold War and collapse of the power balance in favor of the US it will try to discourage the US and its allies from atomic attack and further sanctions by developing its nuclear power. Given that Korea has achieved a suitable level of deterrence, it will prevent Trump excess avarices ($_{11}D$). Or leave pertinacity and submit to negotiations ($_{11}C$). Game g_{11} isn't a strategy maker for two players. Nash equilibrium and pairs of rational actions are $(_{11}D,_{11}C)_{1,2}$ and $(_{11}C,_{11}D)_{1,2}$.
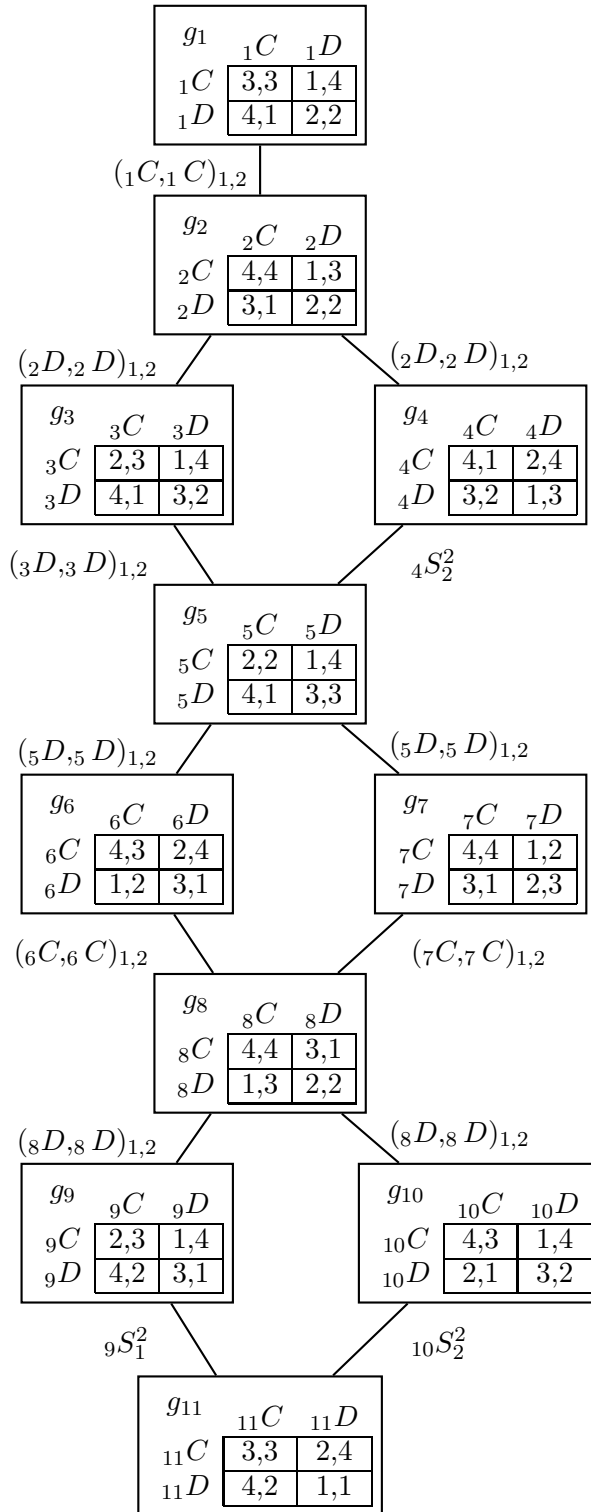
g_1

	$_1C$	$_1D$
$_1C$	3,3	1,4
$_1D$	4,1	2,2

$(_1C,_1C)_{1,2}$

g_2

	$_2C$	$_2D$
$_2C$	4,4	1,3
$_2D$	3,1	2,2

$(_2D,_2D)_{1,2}$ $(_2D,_2D)_{1,2}$

g_3

	$_3C$	$_3D$
$_3C$	2,3	1,4
$_3D$	4,1	3,2

g_4

	$_4C$	$_4D$
$_4C$	4,1	2,4
$_4D$	3,2	1,3

$(_3D,_3D)_{1,2}$ $_4S_2^2$

g_5

	$_5C$	$_5D$
$_5C$	2,2	1,4
$_5D$	4,1	3,3

$(_5D,_5D)_{1,2}$ $(_5D,_5D)_{1,2}$

g_6

	$_6C$	$_6D$
$_6C$	4,3	2,4
$_6D$	1,2	3,1

g_7

	$_7C$	$_7D$
$_7C$	4,4	1,2
$_7D$	3,1	2,3

$(_6C,_6C)_{1,2}$ $(_7C,_7C)_{1,2}$

g_8

	$_8C$	$_8D$
$_8C$	4,4	3,1
$_8D$	1,3	2,2

$(_8D,_8D)_{1,2}$ $(_8D,_8D)_{1,2}$

g_9

	$_9C$	$_9D$
$_9C$	2,3	1,4
$_9D$	4,2	3,1

g_{10}

	$_{10}C$	$_{10}D$
$_{10}C$	4,3	1,4
$_{10}D$	2,1	3,2

$_9S_1^2$ $_{10}S_2^2$

g_{11}

	$_{11}C$	$_{11}D$
$_{11}C$	3,3	2,4
$_{11}D$	4,2	1,1

Figure 2. The dynamic system of political relations games of the USA and North Korea

The system history is as follows:

$$H = \Big\{ \emptyset, \big\{ g_1, (_1C,_1C)_{1,2} \big\}, \big\{ (_1C,_1C)_{1,2}, \{ g_2, (_2D,_2D)_{1,2} \} \big\},$$
$$\big\{ (_1C,_1C)_{1,2}, \{ g_3, (_3D,_3D)_{1,2} \} \big\},$$
$$\big\{ (_2D,_2D)_{1,2}, \{ g_4,_4 S_2^2 \} \big\}, \big\{ (_3D,_3D)_{1,2}, \quad _4S_2^2, \{ g_5, (_5C,_5C)_{1,2} \} \big\},$$
$$\big\{ (_5C,_5C)_{1,2}, \{ g_6, (_6C,_6C)_{1,2} \} \big\}, \big\{ (_5C,_5C)_{1,2}, \{ g_7, (_7C,_7C)_{1,2} \} \big\},$$
$$\big\{ (_6C,_6C)_{1,2}, (_7C,_7C)_{1,2}, \{ g_8, (_8D,_8D)_{1,2} \} \big\}, \big\{ (_8D,_8D)_{1,2}, \{ g_9,_9 S_1^2 \} \big\},$$
$$\big\{ (_8D,_8D)_{1,2}, \{ g_{10},_{10} S_2^2 \} \big\}, \big\{ _9S_1^2,_{10} S_2^2, \{ g_{11} \} \big\} \Big\}.$$

According to the presented games, both America and North Korea have started a chicken game in this crisis. A situation that sometimes is stated by the phrase of welcoming danger. In this situation the engaged parties are forced to make unpleasant decisions. In the chicken game as a player goes out is titled coward, therefore players try to insist on their positions. If one party gives up, the game ends such that is for another benefit. But if party gives up, both see themselves in a position that can be catastrophic. This is very dangerous because it results in direct conict. But who has to be give up? It seems that it is better both parties give up, but this requires cooperation. Therefore, the six-party negotiations must be resumed. Other countries have to mediate until both of the players don't feel failure and get out of the chicken game situations and tensions reduces. South Korea played well its role and took action on the right time. South Korean and North Korean presidents' recent meeting can be evaluated as a part of the very trend as well as the result of PyongYang conditions toward peace, an unprecedented and problem-solving meeting that turned out as the main headline in most of the prominent media world-wide, the case that was evaluated to be positive by the leaders of both countries. No doubt that unity of Koreas not only plays an important role in controlling the crisis but also includes many advantages for both countries which will be referred briey in the following.

3.9. Unity of Koreas and its Role in Crisis Solution. North Korean nuclear crisis and separation of the peninsula affected not only the people but also power relations in the region. Separation, war, and dominant ideological conditions in both countries separated the conditions quickly and intensely. The more time goes by from their separation, the more differences grow between them; thus, their re-unity, which has been long-standing wish of Korean people, becomes harder and more

complicated. In the process of re-unity of Koreas, economic and cultural dimensions will be extremely vital and challenging such that the united Korea is expected to impact the economic and cultural relations of the region and of the world more than before if such event takes place (it is note-worthy that Stock Exchange of Asia on the first workday after the historical meeting of the leaders of both Koreas wore green uniforms, and South Korean monetary unit raised). The existing potentials for quick economic growth in North Korea can improve the economic growth of South Korea which is running out of natural as well as human resources since North Korea has plenty of natural resources and young population; likewise, its mineral reserves considerably outnumber those of South Korea. This issue is one of the reasons that can be useful in up-dating the economy of the northern part as well as developing a united Korea. South Korea will unite with the North one which has a younger population and almost double number of children. This issue will be an advantage. On the other hand, taking financial and food helps to decrease the problems in northern part of the peninsula will be quite essential. To achieve this goal, encouraging foreign investors and international businessmen to contribute the economic development of the northern part will also be quite vital because North Korean infra-structures especially in the domains such as energy, foodstuff production, communications, and agriculture need special attention. For instance, by means of topographic situations of the peninsula, sudden migration of the North Koreans to the South Korea can be prevented or at least controlled. Income per capita in the northern part can double if a semi-decade plan is devised because equalization of income per capita of both Koreas in a short period of time seems impossible and illogical. Therefore, unity of both Koreas, in case of realization, will become one of the most important geo-political and economic events of the world which will be followed by huge repercussions for both countries. It is evident that if both Koreas carry on their cooperative game, they will definitely benefit from each other in the long run. In other words, the game will bring about a win-win result. South Korea can achieve success even more than Japan out of this unity. South Korea has gained a charismatic image in the world due to its efforts for making peace. This country can play a much more effective role in international relations in comparison with its neighboring countries such as Japan. Likewise, northern part of the Korean peninsula will witness a quick economic growth. In case of an effective management and a scheduled plan, the united Korea can display a colorful image of itself in the regional and international politics and economy due to the extra existing potentials

other than those for solving the crisis problem; as a result, a political and economic miracle will readily occur through long-term efficient policies. North Korean nuclear crisis and separation of the peninsula affected not only the people but also power relations in the region. Separation, war, and dominant ideological conditions in both countries separated the conditions quickly and intensely. The more time goes by from their separation, the more differences grow between them; thus, their re-unity, which has been long-standing wish of Korean people, becomes harder and more complicated. In the process of re-unity of Koreas, economic and cultural dimensions will be extremely vital and challenging such that the united Korea is expected to impact the economic and cultural relations of the region and of the world more than before if such event takes place (it is note-worthy that Stock Exchange of Asia on the first workday after the historical meeting of the leaders of both Koreas wore green uniforms, and South Korean monetary unit raised). The existing potentials for quick economic growth in North Korea can improve the economic growth of South Korea which is running out of natural as well as human resources since North Korea has plenty of natural resources and young population; likewise, its mineral reserves considerably outnumber those of South Korea. This issue is one of the reasons that can be useful in up-dating the economy of the northern part as well as developing a united Korea. South Korea will unite with the North one which has a younger population and almost double number of children. This issue will be an advantage. On the other hand, taking financial and food helps for decreasing the problems in northern part of the peninsula will be quite essential. To achieve this goal, encouraging foreign investors and international businessmen for contributing to economic development of the northern part will also be quite vital because North Korean infra-structures especially in the domains such as energy, foodstuff production, communications, and agriculture need special attention. For instance, by means of topographic situations of the peninsula, sudden migration of the North Koreans to the South Korea can be prevented or at least controlled. Income per capita in the northern part can double if a semi-decade plan is devised because equalization of income per capita of both Koreas in a short period of time seems impossible and illogical. Therefore, unity of both Koreas, in case of realization, will become one of the most important geo-political and economic events of the world which will be followed by huge repercussions for both countries. It is evident that if both Koreas carry on their cooperative game, they will definitely benefit from each other in the long run. In other words, the game will bring about a win-win result.

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3.10. Relationships perspective. According to the game system that we presented and the advantages of unity of both Koreas discussed in 3.9, it is understood that Kim Jong Un's cooperation gesture was quite predictable. Economic pressures and sanctions are definitely a few of the reasons of making such decisions by North Korea. North Korean leader once in an interview said that he didn't like to have a bitter ending like Muammar Gaddafi. This issue shows that fearing from such ending puts him in a situation to prepare him for negotiations. Un seeks to improve the situation in North Korea, consolidate his position, and relieve the sporadic riots by gaining people's satisfaction. On the other hand, not only has this action contributed to a decrease of pressures of the world community on North Korea, but also Pyongyang has to some extent relieved his neighbors bysuggesting a solution for the current situations. North Korea's joining the US-lead coalition will make a balance between American power and Chinese hegemony. Vancouver meeting is the evidence for this issue. The meeting which America and its allies organized for investigating the current issues between the two Koreas on January 16 in Vancouver, Canada right after Pyongyang began its negotiations with its southern neighbor. This meeting was held in the absence of Russia and China as the two members of six-party negotiations for the solution of Korean controversy. In case the negotiations are effectual, the West will win the East. Unity of two Koreas was an intelligent strategy that was chosen with the purpose of solving Korean peninsula crisis in the first step. But the second and crucial step is the final agreement between the US and North Korea. It might be for this reason that North and South Korean leaders, after their historical meeting, said that they will arrange a trilateral meeting with the US as the third party, and hold a meeting with the participation of both Koreas, the US, and China seems likely. On the other hand, despite the crucial steps taken, we should note that

settling Korean peninsula controversy seems to last long, and complicated steps are still to be taken because Pyongyang is supposed to lose its most important power tool namely its nuclear weapons as South Korea has declared that North Korean leader promised to shut down its chief site of nuclear test. We should wait to see what privileges the UN will be ready to lose them for. Removal of threats, guarantee of security, and economic privileges are among the most important issues. On the other hand, this event is for the US's benefit especially for Trump's since this will be a positive point for him during his presidency. This is the success that the former presidents couldn't have achieved. In fact, he is making a hero of himself. Thus, we should wait to witness a big historical event, an event in which South Korea and China will have an important role.

Conclusion. Korean peninsula crisis is of multi-dimensional importance for American, Chinese, Russian, Japanese, and South Korean activists in the regional level of East Asia because this crisis is not only relevant to Washington and Pyongyang conflict, but it is also relevant to strategic and security differences among Washington, Beijing, and Moscow as well as security concerns of Tokyo and Seoul due to their fear of atomization of Pyongyang. North Korea's gaining access to nuclear weapons as a beginning point to capture Asia and strategic life of the East have led to regional disorder and nonlinearity of crisis. America's regional allies will escalate preventive actions as well as formulation of weapons contest if the controversial trend in the Korean peninsula persists. However, power balance will move toward Russia and China, so Trump's attitude is to prevent China's hegemony as well as to keep power balance in East Asia, then to try to cut China's support of North Korea and put this country under pressure and isolate it through numerous methods. Studying the past behavior of both countries by means of dynamic system of strategic games and modeling the games that have developed between the two countries and their selective strategies in different areas show that North Korea's goal to following atomic bomb production strategy has been to create a bed for bargaining because this country can force his enemy to accept its demands including signing non-aggression contract, normalizing the relations, and offering economic contributions to Pyongyang. Nevertheless, tensions moved forward due to the US strategies, what North Korea calls it perjury, and lack of objective security guarantees from the US. Therefore, the afore-mentioned attitude together with South Korea's intermediary role puts an end to North Korean nuclear display, and the security challenge of both enemies

soothe at least for a short time. In case both enemies abide by their commitments in the long time, this issue will result in a sustainable peace to both Korea's as well as all humans' benefit.

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