

*Divided We Stand:  
A Game Theoretic Analysis of the  
Semi-Centennial Cyprus Dispute*

*Benimsenen Ayrıklık: Yarım Yüzyıllık Kıbrıs Anlaşmazlığının Oyun Kuramsal Bir Çözümlemesi*

Bülent Temel

Abstract

*In this article, game theoretic models are used to explain why the dispute on Northern Cyprus has been continuing for over half a century, and to propose measures to increase the prospects of resolution in the future. Public opinion polls on the Greek and Turkish sides of the island prior to the two referendums on the Annan Plan in 2004 revealed that perceived payoffs in the plan created a negotiations game, in which Nash equilibrium did not exist in the case of cooperation. For peace negotiations to conclude successfully in the future, game model they resemble needs to be converted into a stag hunt game, in which Nash payoffs are present not only in mutual defection, but also in cooperation. As an international organization that associates with all primary actors of the conflict, European Union would be the authority that is best equipped to influence the payoffs and the cognition of the game so that such a conversion could be facilitated conciliatorily.*

**Keywords:** *Cyprus, game theory, prisoner's dilemma, stag hunt game, Nash equilibrium.*

Özet

*Bu çalışmada Kuzey Kıbrıs üzerindeki anlaşmazlığın neden yarım yüzyılı aşkın bir süredir devam ettiği ve bu sorunun çözümü için nelerin yapılabileceği oyun kuramı modelleri vasıtasıyla açıklanmaktadır. Adada Annan Planı'na dair 2004'te yapılan iki halkoylamasından önce yürütülen kamuoyu yoklamaları iki halkın planın sunduğu çıkarları Nash dengesinin işbirliğinde ortaya çıkmadığı bir müzakereler oyununu üretecek şekilde algıladıklarını ortaya koymuştur. Barış görüşmelerinin gelecekte başarıyla sonuçlanabilmesi için temsil ettikleri oyun modelinin Nash noktasının sadece uzlaşmama seçeneğinde değil işbirliği yapma seçeneğinde de ortaya çıktığı bir geyik avı oyununa dönüştürülmesi gerekmektedir. Bu dönüşümün yapıcı bir şekilde gerçekleştirilmesi için gerekli olan çıkar ve algı yönetimi işlevini yapmaya en uygun olan otorite konunun tüm taraflarını ilgilendiren bir uluslararası örgüt olan Avrupa Birliği olacaktır.*

**Anahtar kelimeler:** *Kıbrıs, oyun kuramı, tutsakların ikilemi, geyik avı oyunu, Nash dengesi.*

## Historical Trajectory

Historically, Cyprus has been an island of geostrategic significance, and a primary element in the near eastern politics (Dinkov & Stojanov, 2005: 172). Located at the eastern end of the Mediterranean Sea, and between Eastern Europe and the Middle East; the island conventionally functioned as an 'aircraft carrier' to accommodate political and military strategies in the region. The Greco/Turkish relationship in Cyprus began in 1571 when the Ottoman Empire conquered the island, and the first Turkish settlements were established in the area (Turnbull, 2003: 57). After three centuries of peaceful coexistence, tension between the two communities began to surface with the island's takeover by the British in the late 19<sup>th</sup> Century. With the Cyprus Convention of 1878, the Ottomans granted the administrative rights of the island to England in exchange for the British support in the Congress of Berlin (Hill, 1952). The Lausanne Treaty of 1923, which established Republic of Turkey as an independent nation, shifted all rights on the island to the British government. Cyprus has become a British colony, and a Turkish Consulate was opened on the island as the diplomatic representative of Turkey (Britannica, 2012).

Colonial British takeover, however, led to social unrest on the island. In 1931, the British Governor's residence was burned down by Greek vigilantes who initiated an anti-imperialist campaign called *enosis*. Literally meaning 'union', the movement sought to unite Cyprus with Greece. Albeit a campaign that opposed the British rule on the island without any reference to the Turks, *enosis* provoked disquietude among the Turkish minority in Cyprus (Mallinson, 2005). Turkish Cypriots rejected it as a politically infeasible and potentially persecutory goal, and favored the idea of joining Turkey, which was 40 miles to the island instead of Greece 700 miles away.

As anti-imperial sentiment spread around the globe in the wake of WW2, Greece applied

to the United Nations for recognition of Cyprus' right to self-determination. The UN declined the application. A year later in 1955, social turmoil escalated as the pro-Enosis Greek organization EOKA began terror acts against Greek Cypriots who did not support *enosis* as well as the Turkish Cypriots. When attacks against the Turks spread over to Istanbul, a strongly nationalist sentiment took a hold in the country. Foreign components in Istanbul were attacked by the upset locals during the September 6-7 Pogrom of 1955, which resulted in 13 casualties, 200 injured and 5,300 damaged buildings (Kuyucu, 2005: 362). This period marks the emergence of a counter agenda by the Turks, which has placed the dispute over Cyprus on a platform of false dichotomy defined by identities. *Taksim* (meaning 'allotment' in Ottoman Turkish) referred to a partitioning of Cyprus by Turks in the northern third of the island, and Greeks in the rest. The idea has become equally unpopular among the Greek Cypriots as *enosis* was among the Turkish.

In 1959 and 1960, London and Zurich Agreements were signed by the British, Turkish and Greek governments, and the leaders of Greek and Turkish communities in Cyprus (King, 1963). The treaties declared Cyprus as an independent nation, and included a constitution for the new country. The general sense behind the constitution was that Greek and Turkish communities would elect their own leaders who would co-lead their joint country (Camp, 1980: 47). President would be a Greek Cypriot elected by Greek Cypriots, and the Vice President a Turkish Cypriot elected by the Turkish locals of the island. Three of the ten members of the Council of Ministers would be Turkish Cypriots nominated by the Vice President, and members of the House of Representatives would be elected by their respective communities in predetermined numbers. Constitutional procedures disallowed either one of the communities to pass a resolution unilaterally. The Supreme Court was comprised of two ethnic based sections, each of which would hear

cases pertaining to its own community. Disputes involving both communities would be heard by judges from both sides.

The constitutional attempt for consociational democracy in Cyprus revealed that power sharing arrangements are harder to implement than design when power is distributed unevenly in a political environment. Shortly after the legislation of the constitution, President Makarios began to initiate a series of actions to dilute the Turkish hold on the country. In the November of 1963, US President John F. Kennedy urged Makarios to refrain from his agenda, which would jeopardize the fragile sociopolitical stability on the island (Lester, 1963: 5). Turkish Government concurred with an announcement that it would not allow unilateral amendments to the Constitution of Cyprus. The following seven months became a period of terror against the Turks in Cyprus. Frustrated with the deadlock in the diplomatic arena, EOKA, shortly after another unsuccessful negotiation attempt, carried out an ethnic cleansing campaign against the Turkish subjects on the island. 24 Turkish villagers were massacred by the EOKA rebels in a 1964 attack, horrible artifacts of which has been chillingly exhibited in the Museum of Barbarity in Lefkosia today (Cassia, 1999: 38).

In the July of 1974, a military junta from Greece executed a coup d'état and took over the government of Cyprus. The country's Greek President Makarios had to take refuge in the British base on the island, and went on a political asylum soon after. Turkish Prime Minister Bülent Ecevit called the British Government into action by citing the constitutional guarantees British and Turkish Governments gave in Zurich and London Agreements to protect the bilateral nature of the government of Cyprus. British Government, however, opted out of its binding obligation as a signatory and guarantor of the subject treaties, and avoided any involvement in the matter. Consequently, Turkish Government singularly sent its troops to the north side of the island to protect the Turkish community from

the persecutory violence of the Greek troops. The two armies fought on various locations for several days until they ceased fire upon a call by the UN. While peace negotiations in Geneva were underway, attacks against Turkish locals continued. As a result, Turkish government expanded its coverage of the island, and concluded the *Cyprus Peace Operation* when it took control of 37% of the island in the north. In 1975, Turkish government declared establishment of a Federated Government of Turkish Cyprus, and signed an agreement with the Greek Cypriot leadership to allow an optional population exchange between Greek Cypriots in the North and Turkish Cypriots in the South in order to minimize the likelihood of intercommunal strife in the future (Camp, 1980: 48).

In 1977 and 1979, the President of the Federation of Turkish Cyprus, Rauf Denktaş and the President of Greek Cyprus, Makarios III (and later, his successor Glafkos Clerides) signed agreements to negotiate the terms and conditions of an independent Cyprus under a federal system. Reconciliatory sentiment, however, was compromised once again in 1982 when the newly elected Prime Minister of Greece, Andreas Papandreou declared that 'Cyprus is a part of Hellenism' and asked the UN to compel Turkey to remove its 'occupying troops' from the island (Migdalovitz, 2002). In response, the Federated Turkish Cypriot parliament declared in 1983 that it established a sovereign country under the name of Turkish Republic of Northern Cyprus. Unilateral declaration of independence caused fury among the international community, and shifted the focus of the discourse on the issue from the factors of disagreement to the legitimacy of the declaration of independence. The UN Security Council condemned the declaration on the 18<sup>th</sup> of November, 1983, and called it a 'separatist act' on the 13<sup>th</sup> of May, 1984. Today, Turkish Republic of Northern Cyprus remains to be an area with questionable status (European Court of Human Rights, 2001). It is recognized only by Turkey as an independent state while the rest of the world

considers it as an ‘occupied territory’ that belongs to the Republic of Cyprus.

Several attempts to resolve the dispute have proven unsuccessful to date. The fact that diplomatic negotiations with various leaders and proposals over three decades failed to yield any positive outcome suggests that some incentives exist within the framework of negotiations that drive policymakers to disfavor resolution. The history of intercommunal antagonism in Cyprus hampers any effort to inject empathy into the equation, and sustains the mutual perception of the conflict as a zero sum game. The insights from history and game theory suggest that resolutions of international conflicts are contingent upon each party evaluating the other’s payoffs from an empathetic perspective, and demonstrating compromise with a pragmatic spirit. In the following sections, payoffs in the two Annan Plan referendums in 2004 are examined, and the prospects for a future resolution are assessed from a game theoretic angle.

### Peace Negotiations Since 1983: A Non-cooperative Game

Five negotiations have been undertaken to settle the dispute over the area since the declaration of independence of Northern Cyprus in 1983. In 1985 and 1986, Turkish side supported the two UN proposals titled *Outline of the Agreement on Cyprus*, but the Greek side vetoed it. In 1990, the *New York Summit* ended unsuccessfully. In 1992, the UN’s *Set of Ideas* was approved by both parties, but the plan was overturned by the next Greek Cypriot President Glafcos Clerides later on. Finally, on April 24, 2004; referendums on the *Annan Plan* in Greek and Turkish parts of Cyprus revealed that 65% of the Turkish Cypriots favored the proposal while 76% of the Greeks rejected it.

The Annan Plan was the most promising and accordingly the most disappointing attempt of reconciliation in Cyprus. Prepared under the good offices of the then UN Secretary General Kofi

Annan, the plan was perfected in five rounds over a course of 1.5 years. Backed by a vast majority of the international community (Russia was the only major power that opposed the plan), the proposal included below provisions in its envisioning of a united Cyprus (The United Nations, 2004):

- A federal political system inspired loosely from the Swiss and Belgian federal models.
- A Presidential Council composed of six voting members who are elected by the parliament according to the proportion of each community’s population against one another, and three nonvoting members, two of whom would be Greek and one would be Turkish.
- A leader from each community who will be selected as the President and Vice President by the Presidential Council from among its members, and switch their seats every 20 months during the 5 years of the Council’s work period.
- A bicameral legislature comprised of a 48-member Senate with equal allocation of members over the two communities, and a 48-member Chamber of Deputies whose member distribution is determined according to populations of the two communities.
- A Supreme Court with an equal distribution of judges from each community, and an addition set of three non-Cypriot judges appointed by the Presidential Council.
- A Reconciliation Commission to settle outstanding conflicts between the two communities.
- A federal constitution, two state constitutions, a flag for the Republic of United Cyprus and a national anthem.
- A limited right to return to former homelands granted to both peoples.
- Smaller but permanent military bases maintained on the island by the governments of Greece and Turkey.

In an effort, perhaps, to dissociate the issue from political egos and competition, Kofi Annan unprecedentedly bypassed the elected leaderships, and presented his plan to the peoples on both sides of the island. In the seven main issue areas,

the expectations of the two communities, and the extent to which Annan proposal satisfied them were summarized in Table 1.

island, substantial international economic support, 8% more territory, contribution to improvement of the historic tension between Greece and Turkey,

Table 1. Outcomes for the Greek side in Various Possible Referendum Results

	Turkish result: YES	Turkish result: NO
Greek result: YES	<p>Pros: Larger autonomy as a peaceful federal state that do not need nondomestic support.</p> <p>.Longstanding mutual headache ends</p> <p>.Substantial international economic support gained.</p> <p>.Better Greece/Turkey relations furthered Some territorial gains</p> <p>.Less Turkish military presence on the island.</p> <p>Cons: Prosperous status quo jeopardized Reward the longtime adversary in the North with an EU ticket</p> <p>. 'Occupier' Turkey's bid to the EU strengthened.</p>	<p>Pros: International support enhanced</p> <p>.Southern Cyprus enters the EU without the Northern part, and uses its political capital as a pro-peace member to have the EU to compel Turkey to withdraw its troops from the North.</p> <p>Cons:</p> <p>.Signals larger desire to unite, which may lead to increased demands from the Turkish side in the future.</p>
Greek result: NO	<p>Pros: Prospect for a better deal in the future sustained.</p> <p>Cons: Weakening of support from international community.</p> <p>.Look like the belligerent side in the conflict.</p> <p>.Possible lift of settlement quotas as a result of increased international endorsement of the North.</p>	<p>Pros: Prospect for a better deal</p> <p>Cons: Apparent irreconcilability may convince the international community that the 1983 decision for independence is an endorsable idea.</p> <p>.May lead to increased pressure from the EU for resolution.</p>

Under the light of these provisions, each party had four possible referendum results to evaluate before its respective referendum: Mutual *Yeses*, own *Yes* and a reciprocal *No*, mutual *Nos*, and own *No* and a reciprocal *Yes*. For Greek Cypriots, a *Yes* vote from both referendums would promise larger autonomy as the island would convert to a non-conflicting federal state that do not need foreign support any longer. A *Yes/Yes* outcome would also mean resolution of a longstanding headache on the

and significantly reduced presence of the Turkish military in Cyprus. Costs of these benefits to the Greek side were perceived to be several (Tocci, 2010: 335-337): A united Cyprus would mean, from a Greek Cypriot perspective, an unnecessary risking of the *status quo* that brought prosperity on the South side of the island. For nationalistic hardliners, the idea of a united Cyprus was rewarding their longtime adversary in the North with an easy ticket to the EU as the island was about to be admitted

to the union regardless of the referendum results (Yeşilada & Sözen, 2002). Additionally, unification would strengthen Turkey's bid to join the EU, which attracted vehement opposition from the Greek Cypriots who perceived Turkey as the longtime invader of their island (Lambrou & Filios, 2004).

The value of a *Yes* vote in the case of a Turkish *No* would further the international support the Southern Cyprus had been receiving. Furthermore, some analysts speculated that a *Yes* vote from the Greek referendum would create a win/win situation for Greek Cyprus, because even if Turkish referendum resulted in a *No* vote, Southern Cyprus would enter the EU without the North, and use its political capital as a pro-peace member to have the EU compel Turkey for withdrawing its troops from the North. The primary cost of a Greek *Yes* and Turkish *No* outcome for the Greek Cypriots was that it would signal to the Turks that Greeks have larger desire to unite, which could lead to increased demands from the Turkish side in the future.

A *No/No* outcome could leave the door open for policymakers on both sides to draft a better deal

disagreement on the referendums could also lead the EU to apply pressure on the Southern Cypriots and Greeks to resolve the issue as they are the only actors in the conflict that are members of the EU.

If the Greek referendum yielded a *No* and the Turkish one a *Yes* vote (as they ended up doing), then perceived prospect for a better deal in the future would have been sustained (Andronikos, 2002). This attitude, however, would weaken the international support of the Greek cause on the island, and make the Greek Cypriots appear to be some hardliners who sustain the longstanding conflict. An increased international support to the Turkish cause could potentially result in fewer population quotas imposed on the Northern part, which would turn the population race to the favor of the Turkish side, and further weaken the Hellenic aspiration of *Megali Idea*. Pros and cons of the possible outcomes from the two referendums held simultaneously are summarized in Table 2.

A hierarchal ranking of the possible outcomes for both parties surfaces when two sets of information are blended: The extent to which

Table 2. An Ordinal Ranking of the Possible Outcomes from the Greek Perspective

Ranking	Referendum Outcomes
1	Greek <i>No</i> , Turkish <i>Yes</i>
2	Greek <i>No</i> , Turkish <i>No</i>
3	Greek <i>Yes</i> , Turkish <i>No</i>
4	Greek <i>Yes</i> , Turkish <i>Yes</i>

in the future in order to break a now longer tradition of non-reconciliation (Drousiotis, 2004). This potential benefit, however, would harbor the risk of an international acknowledgment of Northern Cyprus as an independent country. The concern here was that, in a conjuncture in which resolution of the Cyprus dispute could not be attained over the course of several decades, international community would be less open to the idea of continuing peace negotiations, and more inclined to treat the 1983 independence as a viable solution. A strict

the Annan Plan satisfied both parties' expectations on the micro level, and the political consequences of various referendum results on the macro level. Sözen and Özersay's study titled *The Annan Plan: State Succession or Continuity* reveals that the plan's proposals in the areas of political system, guarantorship, displaced people and properties, territorial adjustments, military presence, settlers and immigrants, and the EU membership were more compatible with the priorities of the Turkish side than the Greek side (Sözen & Özersay, 2007).

Annan ideas were close to accommodating Turkish expectations in all seven of the issues areas except for the issue of settlers and immigrants. On the other side, the plan offered ideas that satisfied (loosely) only the territorial expectations of the Greek Cypriots. Predictably, the two referendums resulted in a strong *No* vote on the Greek side and a strong *Yes* vote on the Turkish one.

Give that the Greeks did not favor the Annan Plan (a sure *No* outcome from the referendum held in the south), a Greek *No*/Turkish *Yes* was the best possible outcome from their viewpoint. The Greek electorate would like a *Yes* vote from the Turks to a *No* vote, because it would create a message that would question the legitimacy of the Turkish Republic in the north. If Turkish residents of the island who lived in what they argued to be an independent country in the north supported the idea of joining the south as an independent federal area, which is a step down from the sovereign status, credibility of the independence of Northern Cyprus would have been compromised. This is an unexplored aspect of the Cyprus conflict that merits further scholarly investigation.

For Greek voters, in the case of a Greek *Yes* outcome, which was possible but unlikely, a Turkish *No* would be more preferable to a Turkish *Yes*. In this case, Greeks would have attained the

This qualitative analysis, confirmed by the referendum results with a 76% *No* vote by the Greeks, generates the payoff table shown in Table 4 for the Greek Cypriots.

For Turkish Cypriots, each of the four possible outcomes referred to a different political ramification (Table 5). A *Yes/Yes* outcome from the two referendums would likely lead to unification of Cyprus, which would mean entering the EU as a part of a unified Cyprus. Such an outcome would also strengthen Turkey's bid in the EU (Loizides, 2002: 430). It would be a payback to the motherland that had protected the small Turkish community in the Northern Cyprus to the expense of risking its own global aspirations for years. A united Cyprus that resolved its domestic conflict would develop more rapidly as the foreign investment as well as development loans would follow a positive correlation with political stability on the island. Political costs of these positive accomplishments would be some territorial loss (8% of the island) and fewer Turkish peacekeeping forces on the island.

Just as a *No* vote represented a win/win situation for Greek Cypriots, a *Yes* vote created a similarly favorable situation for the Turkish Cypriots (Kaymak, 2009). Even if a *No* vote emerged from the Greek referendum, a *Yes* vote from the Turkish one would bring considerable political gains to

Table 3. Payoffs for Greek Cypriots in vVarious Scenarios

	Turks cooperate ( <i>Yes</i> vote)	Turks refrain ( <i>No</i> vote)
Greeks cooperate ( <i>Yes</i> vote)	4	3
Greeks refrain ( <i>No</i> vote)	1	2

no-solution outcome they sought in such a way that they made the Turks look like the belligerent and uncompromising side of the conflict. Because Greek habitants of the island did not generally favor the Annan Plan, a *Yes/Yes* outcome would be the worst possible scenario for them. From these assessments, possible outcomes for the Greek Cypriots can be ranked as in Table 3.

Turkish Cypriots. It would make the Northerners look like the cooperative and constructive side of the dispute, which would attract more sympathy from the international community, an overwhelming majority of which stood firmly behind the Annan bill. This could potentially result in a relaxation of the population quotas imposed on the Turkish side, which had put a cap on the number of people that

Table 4. Outcomes for the Turkish Side in Various Possible Referendum Results

	Turkish result: YES	Turkish result: NO
Greek result: YES	<p>Pros: Larger autonomy as a part of an internationally recognized EU member country.</p> <ul style="list-style-type: none"> <li>.Entry to the EU.</li> <li>.Substantial international economic support gained.</li> <li>.Payback to longtime protector Turkey by improving its odds with the EU.</li> </ul> <p>Cons: Some territorial loss.</p> <ul style="list-style-type: none"> <li>.Less Turkish military presence on the island.</li> </ul>	<p>Pros: Prospect for a better deal in the future sustained.</p> <p>Cons: Weakening of support from international community.</p> <ul style="list-style-type: none"> <li>.Look like the belligerent side in the conflict.</li> <li>.Possible increase in the scope of embargo applied by the international community.</li> <li>.Potentially worsened relationship with the motherland that supported the plan.</li> <li>.Potential loss of support and protection from Turkey due to frustration.</li> </ul>
Greek result: NO	<p>Pros: International sympathy earned</p> <ul style="list-style-type: none"> <li>.Possible lifting of settlement quotas on the north as a result of international favoring.</li> </ul> <p>Cons: Appearing as the side that suffers more, which may lead to demand acceleration from the South in the future.</p>	<p>Pros: Prospect for a better deal</p> <ul style="list-style-type: none"> <li>.Apparent irreconcilability may convince the international community that the 1983 decision for independence is an endorsable idea.</li> </ul> <p>Cons: May lead to increased pressure on Turkey from the EU for resolution</p> <ul style="list-style-type: none"> <li>.Potential loss of support and protection from Turkey due to frustration.</li> </ul>

can be relocated to Cyprus. Turkish Republic of Northern Cyprus could have been acknowledged by more states as a legitimate political formation given the irreconcilable attitudinal differences between the Greek and Turkish locals of the island.

Despite the endorsement by the Turkish Cypriot President Rauf Denktaş, a *No* vote was an option in which potential costs far outweighed the benefits. If Turks voted *No* and Greeks *Yes*, Turks would look like the uncompromising side of the relationship, thus the primary element to manipulate for the sake of peace (Yılmaz, 2005: 33). Theoretically, it could have left the door open for further negotiations with more favorable offers to the Turks, but this is a line of thinking that exists at all times and is reasonably exploitable only occasionally.

An unsupported Turkish campaign could lead to an increase in the scope of embargo applied on the Turkish third of the island. Such an outcome could also sour Turkish Cyprus' relationship with its motherland that supported the bill in expectation of better terms with the European peers.

In the case of a *No/No* outcome from the two referendums, possibility of improved bargaining would sustain theoretically. It could also potentially lead international powers like the UN, NATO and EU to favor the Northern side's sovereignty as a sensible project to endorse. Nevertheless, there are no safeguards to assure that international organizations would take on that role instead of an opposite one such as increasing the intensity of the pressure they apply on Turkey to convince Northern



Cypriots to cooperate with negotiations. This would be another dynamic that increases political costs for Turkey to back the Turkish cause in Cyprus.

From the perspective of the Turkish electorate that wanted the plan to be implemented, a *Yes/Yes* outcome was the most desired outcome. For the

differently, informs about the expected outcome in a game. Assuming that players of the game are rational and fully informed of the payoffs involved, a simultaneous game like the two Annan referendums held in the Northern and Southern Cyprus on the same day (April 24, 2004) would result in both

Table 5. An Ordinal Ranking of the Possible Outcomes from the Turkish Perspective

Ranking	Outcome
1	Greek <i>Yes</i> , Turkish <i>Yes</i>
2	Greek <i>Yes</i> , Turkish <i>No</i>
3	Greek <i>No</i> , Turkish <i>No</i>
4	Greek <i>No</i> , Turkish <i>Yes</i>

Table 6. Payoffs for Turkish Cypriots in Various Scenarios

	Turks cooperate ( <i>Yes</i> vote)	Turks refrain ( <i>No</i> vote)
Greeks cooperate ( <i>Yes</i> vote)	1	2
Greeks defect ( <i>No</i> vote)	4	3

same rationales mentioned above in the analysis of the Greek line of thinking (but this time with reverse favorability), a Greek *Yes*/Turkish *No* would be more preferable to a *No/No* outcome. A Greek *No* and Turkish *Yes* outcome, which is what ended up being the actual results, not only meant continuation of the dispute, but it also weakened the Turkish case about the independence of the Northern Cyprus. In conclusion, referendum options carried the weights shown in Table 6 for the Turkish Cypriot electorate. Table 7 summarizes the payoffs for the Turkish Cypriots.

Combining the payoff tables for the Turkish and Greek Cypriots prior to their respective referendums brings out the collective payoff matrix shown in Table 8 in the decision game between the two parties.

Nash equilibrium, which refers to the point on which each player's move is the most preferred move for himself given the other one's move, and therefore neither party has an incentive to act any

players acting their respective behaviors shown at the Nash point. In order to find out the Nash equilibrium in the Cyprus model, we first identify the preferred outcomes for each player according to the possible moves of its counterpart.

For Greek Cypriots, whose payoffs are shown as the first values in the matrix, 3<sup>rd</sup> best outcome in the Greek *Yes*/Turkish *No* cell is more preferable to the 4<sup>th</sup> best outcome in the *Yes/Yes* cell (with \*). Similarly, best outcome represented in the *No/Yes* cell is better than the 2<sup>nd</sup> best outcome shown in *No/No* cell. For Turkish Cypriots whose payoffs are shown as the second value in the matrix, a Greek vote of *Yes* is more preferable than a Greek vote of *No* if Turkish winning vote ends up being *Yes*. If Turkish outcome is *No*, then Turkish Cypriots desires a Greek *Yes* over a Greek *No*.

As shown in Table 9, Nash equilibrium in this model exists on the Greek *Yes*/Turkish *No* point (bolded numbers with \*). Under the assumption that our payoff allocations possess a reasonable degree

Table 7. Collective Payoff Matrix for Two Players in the Referendum Game

	Turks cooperate ( <i>Yes</i> vote)	Turks refrain ( <i>No</i> vote)
Greeks cooperate ( <i>Yes</i> vote)	4, 1*	<b>3*, 2*</b>
Greeks defect ( <i>No</i> vote)	1*, 4	2, 3

Table 8. Nash Examination of The game

	Hunter 2 goes for stag	Hunter 2 goes for hare
Hunter 1 goes for stag	<b>100*, 100*</b>	0, 50*
Hunter 2 goes for hare	50*, 0	<b>50*, 50*</b>

of accuracy, we can derive two conclusions from this finding. Firstly, Nash equilibrium's existence at a non-cooperative point (*Yes/No*) validates the suspicion that the seeming irreconcilability of the Cyprus conflict for many decades is an expected result of a mismatch between the perceived interests of the involved parties. Secondly, the fact that actual referendum results turned out to be the opposites of what are foreseen by game theory suggests that actors of the Cyprus conflict may not be as rational as the *homo economicus* postulated in the theory.

### Prospects for Resolution: The Stag Hunt Game

Resolution of the dispute over the status of Northern Cyprus relies on a fundamental transformation of the perceived values of the options and the line of thinking on both sides. The peace negotiations game, which currently encourages the parties to make non-cooperative choices, has to be converted into a game called *Stag Hunt Game* (Skyrms, 2001). The Stag Hunt Game refers to a situation, in which two players accomplish their best possible individual outcomes when they trust each other and cooperate for the best possible collective outcome (Skyrms, 2004). Identified by the 18<sup>th</sup> Century French philosopher Jean Jacques Rousseau in his well-known work titled *A Discourse on Inequality*, the game involves two hunters who need to make a decision before they hunt. Each of them can either try to hunt a hare, or they can collectively

go for a stag. It is possible for a hunter to hunt a hare by himself, but a hare offers less meat than a stag. A stag, on the other hand, is a better prey, but hunting it calls for help from the other hunter. Because half a stag is still much more meat than a full hare, each hunter would rationally be inclined to work together to hunt only stag. However, by doing that, each hunter assumes a risk that the other one can defect as he gets hungry and becomes impatient over time and go for a hare, in which case stags in the area would be scared off due to the sounds of gunshots and he would go empty handed. Mathematically, payoff matrix of a stag hunt situation resembles the one shown in Table 10.

An essential advantage Stag Hunt Game offers in peace negotiations is that it presents two pure strategy Nash equilibria instead of one (bolded squares in Table 10).

When there are two points on which each party maximizes its own payoff at a given countermove, but only one of these points promise the highest return to each party; rational players would be driven to cooperate in order to maximize their respective benefits. While the Nash point at mutual defection (Hare, Hare) is only *Pareto efficient*, the Nash point at cooperation (Stag, Stag) is *Hicks optimal* as well as Pareto efficient. At the (Hare, Hare) point, there is no other option for one player to be better off by making the other player worse off. However, at the (Stag, Stag) point, the same condition is present in such a way that the total payoffs to both players is

maximum in the game. Therefore, the payoff-heavy Nash equilibrium at cooperation dominates the risk-averse Nash equilibrium at mutual defection. Inserting a best interest strategy at cooperation into the Cyprus negotiations would dramatically increase the prospects of reconciliation in the future.

In order to convert Cyprus negotiations into a Stag Hunt Game, international policymakers need to create institutional incentives in order to change the payoffs for each alternative, and use mass media to transform the public discourse into a more rational, pragmatic and constructive one. The European Union, with its association with all of the parties involved in the conflict, would be the authority that is best equipped to accomplish this task. Remaining within the boundaries of democracy and the bylaws of its own constitution, the union can create incentives for Turkish and Greek Cypriot leaders to resolve their historical disagreement. A progressive aid structure that qualifies a united Cyprus (such as a bi state system) for an increasingly higher amount of development loans with respect to the island's aggregate gross domestic product would

and conjuncture; such incentives would create what can be called *fraternal trust* between the two parties. Trust, which is an essential component of the cooperative stag hunt equilibrium, can be established between the Greek and Turkish players of the game (people in a referendum or political leaders in negotiations) by means of both parties' association with the EU. In other words, two sides would act trustfully not because they trust each other, but because they trust each other's commitment to the European Union. Trust is such a crucial factor in socioeconomic progress that, according to French economist Paul Seabright, it may be an element of competitive advantage that distinguishes advanced societies from the others (Seabright, 2004).

The second strategic policy for the EU would be using the mass media to reshape the public consent on all sides of the issue (both parts of the island, Turkey and Greece). TV network executives, movie producers, newspaper editors, radio stations, internet site managers, celebrities and intellectual leaders should be supported to produce public products that downplay the antagonistic history

Table 9. A generic payoff matrix in a Stag Hunt Game

	Hunter 2 goes for stag	Hunter 2 goes for hare
Hunter 1 goes for stag	100, 100	0, 50
Hunter 2 goes for hare	50, 0	50, 50

Table 10. Nash Equilibria in a Stag Hunt Game

	Hunter 2 goes for stag	Hunter 2 goes for hare
Hunter 1 goes for stag	<b>100*</b> , <b>100*</b>	0, 50*
Hunter 2 goes for hare	50*, 0	<b>50*</b> , <b>50*</b>

be an example of such structural incentives.

Another example would be introducing cooperative interstate behavior as a quasi requirement of certain privileges with the EU. While specific ways to accomplish this general approach would vary depending on the context, actors, conditions

between the two nations, and drive the common line of thinking towards a more rational approach predominated by interests, costs and benefits. If the discourse is shifted from an emotional to a rational ground, decision makers on all sides will be more likely to assess their options in terms of net

benefits. Faced with a new set of payoffs created by institutional incentives mentioned above, it becomes visible to both parties that they can reach their best individual outcomes by trusting one another and choosing the option that promises highest possible aggregate return in the negotiations game.

## Conclusion

The dispute over the Northern third of the Cyprus Island in the Eastern Mediterranean provides plenty of reasons to adopt a grim outlook on the future. It includes all three of the factors that have led the mankind into conflict throughout the history: Nationality-driven differentiation, religious-based alienation, and territorial competition. It is a disagreement that has been unresolved for over half a century, which creates an increasingly sticky *status quo* that sustains the state of disagreement. Its leading actors (Turkish Cypriots, Greek Cypriots, Turkey and Greece) have a history of antagonism and mistrust towards one another. They possess what anthropologists call *Mediterranean Blood* (higher propensity for emotional thinking), which makes a rational dialogue based on mutual interests less innate. Accession of the Southern part of the island to the European Union in 2004 can potentially jeopardize the perceived credibility of the EU as an impartial mediator.

Nevertheless, it is our central hypothesis that modern social scientific tools can make resolution of the Cyprus dispute more likely than it nominally looks. An examination of the public opinions during the Annan Plan of 2004, which was the most hopeful -and accordingly disappointing- attempt for reconciliation to date, reveals that values attributed to each possible outcome by the people on both sides created a game, in which expected outcome was non-cooperative. Not surprisingly, the two referendums held on the island resulted in opposite ways, which led to the abandonment of yet another peace plan.

In this paper, it is argued that, to maximize

the prospects of resolution in the Cyprus conflict, a two-phase process needs to be executed by the European Union. As the international authority, to which Greeks and Greek Cypriots belong, and Turks and Turkish Cypriots aspire to belong; the EU should work to reshape the common minds on both sides. Popular media instruments should be endorsed in order to transform the public approach to the issue from an emotional angle that factors in past history to a rational one that highlights future benefits. This initial phase would be a slowly progressing period with minimal visible rewards, however the social psychological foundation it will establish would be an essential prerequisite of the next phase; game transformation.

Once reflexes to approach the problem in analytical terms have been internalized, European policymakers should influence the payoffs for each side so that the peace negotiations game resembles a *stag hunt game*. This type of game introduces two Nash equilibria that refer to coexistence of the optimal conditions for each player. Its distinguishing feature is that one of these equilibrium is the payoff heavy point, on which the game is not only Pareto efficient, but also Hicks optimal. If the European Union can change the payoffs for each player in the negotiations game in such a way that the game includes this second Nash equilibrium, then both parties that now assess their options in terms of net benefits would be inclined to choose that option, which is reconciliation.

## References

- Andronikos, Pavlos (2002). The Annan Plan. *Neos Kosmos* 25 November.
- Camp, Glen (1980). Greek-Turkish conflict over Cyprus. *Political Science Quarterly*, 95(1): 43-70.
- Cassia, Paul Sant (1999). Martyrdom and witnessing: Violence, terror and recollection in Cyprus. *Terrorism and Political Violence*, 11(1): 213-245.

- Dinkov, Dinko & Stoyan Stoyanov (2005). The Cyprus problem: International politics simulation. *International Journal of Law and Management*, 47(3): 172.
- Drousiotis, Makarios (2004) comment on *The psychological war is in full swing*.
- Encyclopedia Britannica, entry on 'Treaty of Lausanne', accessed August 25, 2012; <http://www.britannica.com/EBchecked/topic/332502/Treaty-of-Lausanne>.
- European Court of Human Rights. Cyprus vs. Turkey, 2001-IV, application no: 25781/94.
- Hill, George (1952). *A History of Cyprus: The Ottoman Province The British Colony, 1571-1948*. Cambridge: The University Press.
- Kaymak, Erol (2009). The Turkish Cypriot views of the Annan Plan. In: Andrekos Varnava & Hubert Faustmann (eds.) *The Failure to Reunify Cyprus: The Annan Plan, the Referendums of 2004 and the Aftermath*. London & New York: I. B. Tauris.
- King, Gillian (1963). *Documents on International Affairs 1959*. London: Oxford University Press.
- Kuyucu, Ali Tuna (2005). Ethno-religious unmixing of Turkey: 6-7 September riots as a case in Turkish nationalism. *Nations and Nationalism*, 11(3): 361-380.
- Lambrou, Evan C. & Demetris A. Filios (2004). Greek Cypriots galvanized against Annan Plan. *Hellenic Times* 16 March.
- Lester, Robert E. (1963). The John F. Kennedy National Security Files, 1961-1963. Middle East, First supplement.
- Loizides, Neophytos (2002). Greek-Turkish dilemmas and the Cyprus EU accession process. *Security Dialogue*, 33(4): 429-442.
- Mallinson, William (2005). *Cyprus: A Modern History*. London: I. B. Tauris.
- Migdalovitz, Carol (2002). *Cyprus: Status of UN Negotiations*. Washington: CRS.
- Seabright, Paul (2004). *The Company of Strangers: A Natural History of Economic Life*. Princeton, NJ: Princeton University Press.
- Skyrms, Brian (2001). The Stag Hunt. *Proceedings and Addresses of the American Philosophical Association*, 75(2): 31-41.
- Skyrms, Brian (2004). *The Stag Hunt and the Evolution of the Social Contract*. New York City: Cambridge University Press.
- Sözen, Ahmet & Kudret Özersay (2007). The Annan Plan: State succession or continuity. *Middle Eastern Studies*, 43(1): 125-141.
- The United Nations (2004). *Basis for a Comprehensive Settlement of the Cyprus Problem*. New York City.
- Turnbull, Stephen (2003). *The Ottoman Empire 1326-1699 (Essential Histories Series-62)*. Oxford: Osprey Publishing.
- Tocci, Nathalie (2010). Reunifying Cyprus: The Annan Plan and beyond. *Southern European Society and Politics*, 15(2): 335-337.
- Yeşilada, Birol & Ahmet Sözen (2002). Negotiating a resolution to the Cyprus problem: Is potential European Union membership a blessing or a curse? *International Negotiation*, 7(2): 261-285.
- Yılmaz, Muzaffer (2005). The Cyprus conflict and the Annan Plan: Why one more failure? *Ege Akademik Bakış*, 5(1): 29-39.

### Autobiographical Sketch

Bülent Temel is a political economist who teaches and takes part in research at Atılım University and Southern New Hampshire University. He is a frequent contributor to Turkish daily *Cumhuriyet*, and a guest lecturer in various European universities. An editorial board member at the Zurich-based International Journal of Human Rights and Constitution Studies, Temel is the editor of the forthcoming book entitled *European Union Project and Lessons from Greece and Turkey* (Lexington, 2012). He works in the fields of political economics, cooperatism and behavioral economics, and can be reached at [btemel@post.harvard.edu](mailto:btemel@post.harvard.edu)

## Otobiyografik Öz

Bülent Temel, Atılım Üniversitesi ve Southern New Hampshire Üniversitesi'nde öğretim görevliliği ve araştırmacılık yapan bir siyasal iktisatçıdır. Cumhuriyet gazetesinde sıkça yazıları çıkan Temel çeşitli Avrupa üniversitelerinde konuk öğretim görevlisi olarak dersler vermektedir. Zürih temelli International Journal of Human Rights and Constitution Studies (Uluslararası İnsan Hakları ve Anayasa Çalışmaları) dergisinin yayın kurulunda olan Temel, Lexington kitabevi tarafından yayına hazırlanan European Union Project and Lessons from Greece and Turkey (Avrupa Birliği Projesi ve Yunanistan ve Türkiye'den Dersler) başlıklı kitabın da editörüdür.

Siyasal iktisat, kooperatifçilik ve davranışsal iktisat konularında çalışan Temel'e btemel@post.harvard.edu adresinden ulaşılabilir.