# CAN GAME THEORY BE USED TO EVALUATE NORWAY'S RELATIONSHIP WITH THE EU?

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A dissertation submitted to the School of Economics, University of East Anglia, in partial fulfilment of the MA degree in Economics and International Relations

Word count 7805

### Abstract

This dissertation focuses on Norway's relationship with the EU analyzed through using game theory. It provides an overview over the cooperation between the two parts following on to the main analysis. The analysis will provide both game-trees and game-matrices. The conclusion shows that this form of analysis also works in analyzing International Relations outside conflict.

### Acknowledgements

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# 1. Introduction

A quick overview of the situation seems to suggest that there would be mutual benefit from Norwegian membership of the European Union (EU). So why do the Norwegians keep voting against membership? In 1994 the Norwegians voted against accession to the EU, and the need for bilateral cooperation agreements was quickly needed. When drawing up these agreements which basically were based on old and existing agreements, Norway had more to gain than the EU, relatively speaking. Since then, the EU has grown, and the cooperation with Norway has become more expensive for Norway, without the benefits of cooperation increasing at the same pace. The EUs influence over Norway has increased with the EEA agreement. This dissertation will analyse how the relationship between Norway and the EU is today, and how this cooperation can be considered to actually be non-beneficial in the longer run.

The reason for using game theory is that this cooperation is getting increasingly complicated, and game theory helps simplify the matter in order to make it easier to understand. By analysing this way we can highlight the core elements of the interaction between EU and Norway, as well as seeing alternatives of the future cooperation between the two. (Correa, 2001)

In 1944, Morgenstern and van Neumann publicised the book "The Theory of Games and Economic Behaviour". This book was the first of its kind where Game Theory was applied to social interactions. As we know, International Relations are mainly about interactions between two states or more. The book therefore paved the way for further research in International Relations using game theory. (Bennett, 1995)

There are many examples where game theory has been used to explain the choices of certain states. One was able to demonstrate the states thoughts and motives in the standoff between USA and USSR during the Cuba Crisis simply by setting up a matrix and introducing payoffs for the different options. Another example is an arms-race situation, for example between USA and USSR.

The use of this new way of thinking quickly caught on, and military strategists started to use game theory to analyse international conflict. One now had a way to predict with reasonable accuracy what the other player would do, and act accordingly.

When reading this dissertation, one must bear in mind that it has been written in the political-theoretical angle of Realism. The reason for this will be explained in the literature review.

In the first part I will provide a literature review. This will allow me to show where the background of my dissertation comes from and what other academics have written on, or around, the topic. Several games in game-theory have been used to explain different situations in international relations.  The Prisoners Dilemma-game and the Chicken-Game are games that are used extensively in the literature, but also some elements of the Stag-Hunt game will be briefly looked at.

In the second part I will explore the current relationship between Norway and the EU. There are several bilateral agreements between the two parts, for example the EEA-agreement and Schengen agreement. Further on we will explore how these agreements affect the relationship between Norway and the EU.
By analysing the relationship I will be able to decide the payoffs to be used in the analysis in part three.

In part three we will use game theory to analyze the relationship between Norway and EU. I will explain why Norway voted against accession in 1994, and how the current cooperation can shift for the better or worse- a choice mainly dictated by the strong and powerful EU. There will be a game tree as well as a game matrix to visually explain why Norway and the EU chose to cooperate with each other, and how this relationship can be expected to evolve in the future.

Finally there will be a conclusion briefly summarising the dissertation.

## 2. Literature Review

In his article, Correa (2001) defines International Relations as being "an interaction between specific actors which include nation-states, international organizations and multinational corporations".  (Correa, 2001:187) This definition is widely recognised by scholars to be accurate, this include Evans and Newham (1998:274).  With this definition we can see how Game Theory in its simplest form can be applied to international relations, because it is very similar to the interaction between two people.  The first book to be released on the topic of International Relations and Game Theory was "The Theory of Games and Economic Behaviour" by Neumann and Morgenstern (1944) where they analysed head-on conflicts using game theory.

There is no literature that covers my topic exactly. No one has analysed the cooperation between Norway and EU using Game Theory. The way to solve the task would be first to establish an accurate view of how Norway and EU works together, especially what agreements (and disagreements) they have with each other.  There is a lot of information about this, especially when using sources online. However, not all of these are up-to-date or even accurate.  One example is how the homepage of the Norwegian govt. fail to produce numbers on Norwegian

contribution to the EU through the revised EEA agreement in December 2009. There is not much information on this in English, but plenty in Norwegian. Amongst others sources Bergersen and Østreng (2005), Heidar (2001) and Jenssen et al. (1998) combined with web-pages from the Norwegian Ministry of Foreign Affairs[1], the EEA-webpage[2] are good and descriptive sources of the relationship between Norway and the EU.

Game Theory is a very wide topic, and the types of games are endless.

Looking at GT and IR, there are two games that seem most relevant in the literature: Prisoners Dilemma Game and Chicken Game. Bennett, (1995) Snyder, (1977) and Mulford, Berejikian (2002) are good sources. Jervis (1978) and Viotti and Kauppi (2007) also refers to the Stag Hunt game to be used in IR.

<center>Prisoners Dilemma</center>

The Prisoners Dilemma Game is the most referred to in the field of Game Theory and International Relations. For example it is used to show how countries in conflict may lose out due to self interest, rather than cooperate with one another.

Bennett (1995) uses two fictive countries to explain a prisoner's dilemma-game: The two neighbouring countries of Jedeland and Andersland (a real life example here may be the conflict between India and Pakistan, and their armament of nuclear weapons. Correra (2001) uses the same matrix to explain the conflict between the Israelites and the Palestinians with the labels cooperate/confrontation).

The payoff matrix looks like this:

<center>Jedesland</center>

|  | | Disarm | Arm |
|---|---|---|---|
| | Disarm | 3,3 | 1,<u>4</u> |
| Andersland | | | |
| | Arm | <u>4</u>,1 | <u>2,2</u> |

As we can see, both countries wish to gain the upper hand, so both are expected to defect- but the better option

would probably have been to cooperate through signing an agreement where both parts were satisfied. Unfortunately the game tells us that because of the selfish nature of states, they would not trust each other to keep to the agreement. So they may be inclined to keep one weapon more than the other part- and the race would be back on. The Nash Equilibrium is therefore where both parts arm.

## Chicken Game

According to Bennett (1995) and Montet and Serra (2003), this game shows how two players may be better off cooperating, but in the search for the highest payoff they tend to defect from cooperation in hope that the other player cannot. An example of this is the Cold War- the standoff between USA and Soviet during the Cuba Crisis. The payoff matrix may look like this:

<u>Kremlin</u>

|  |  | Back Down | Stand Firm |
|---|---|---|---|
| **<u>White house</u>** | Back Down | 3,3 | <u>2,4</u> |
|  | Stand Firm | <u>4,2</u> | 1,1 |

As we can see from this game, both parts are inclined to stand firm in their quest for the big payoff. However if both refuse to back down we have a situation of war, which does not appeal to any of the players- therefore the least payoff. The best option for both would be to back down, but if they do they risk that the other one won't, and they have effectively lost the game. However, as we can see it is better to lose the game than to end up in war. As we know, the Kremlin did agree to withdraw their nuclear missiles from Cuba, and we ended up at the lower left corner. This is one of the two Nash equilibriums whilst the other is where USA back down and Kremlin stands firm.

## Stag Hunt

Viotti and Kauppi (2007) discuss Rosseau and his fable about the stag-hunters. It is about how a group of hunters are cooperating to hunt for a Stag. If they manage to hunt successfully, all will eat plenty that day. If however one of the hunters should defect from the group and hunt a hare, he will eat tonight but the other hunters will not. This can be represented in the game below:

|  | Individual Interests:<br>Pursue the Hare | Collective Interests:<br>Pursue the Stag |
|---|---|---|
| Short Run | Serve immediate<br>self-interest | May provide basis for<br>possible future collaboration |
| Long Run | No apparent basis for<br>collaborative behaviour | Serve long-term<br>common interest |

Game Matrix Figure, Viotti Kauppi (2007)

We observe how a hunter may be tempted to defect for the short-term benefit- but if one was to repeat the game, say the group gathered to hunt again, the individual who defected from the group was most likely to be mistrusted and the other hunters would defect. They also have the opportunity to exclude the defective individual from the group in a later "game". The dilemma here is whether they should cooperate for the benefit of the group or secure their own short term survival and jeopardizing the group- a similar dilemma Norway is facing.

Interestingly, the games found are explaining conflicts. None of my sources have applied game-theory to the type of cooperation that we see between Norway and the EU, only Correra comes close when he considers the issue surrounding "Game theory and the Economic Relations among Nation States" (Correra 2001, 197), but this only discusses whether Game Theory can be used, and it provides no examples.

In their book, Montet and Serra (2003), explain about the entry-game, a game that shows how a leading business can chose to exclude or include a competitor in an oligopoly. I found the payoffs to be quite similar to the situation EU-Norway, and also the situation where one large entity grants a smaller entity access to its market can be mirrored in this situation.

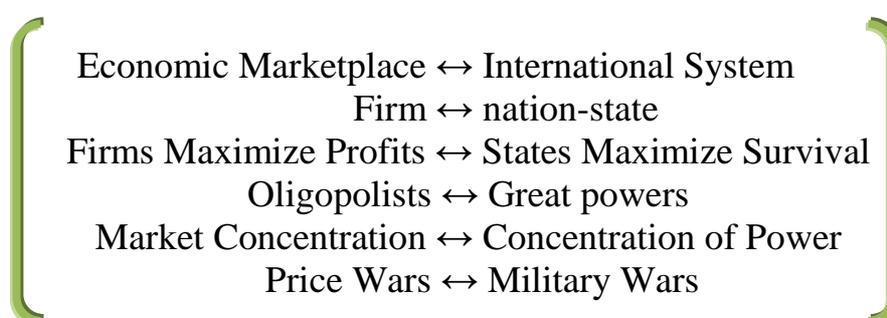<div align="center">Realism</div>

To be able to use Game Theory to analyze the relationship between Norway and EU, one must tie the economic analysis to a theory of International Relations. This is to demonstrate the similarity in Game Theory and Realism.

As Heywood (1998) states in his book, self interest is what drives states in the international environment of anarchy. What a state does is out of self interest- to ensure its own survival. This is the hardcore of realism. With this comes the distrust. The distrust of the other part to defect from any agreement, in order to gain that little bit extra power. The disarmament agreement between Andersland and Jedesland is an example. According to the

theory of realism, organizations like the EU were founded to act as a tool of large powers so they can influence smaller powers. They also prevent smaller powers to gain ground in the power advancement they have. The EU also acts to avoid large powers, like Germany and France, from going to war against each other and thus involve many other states in warfare. (Rittberger & Zangl, 2006) International organizations could also be a tool of a smaller country. The EU allows many smaller states to collectively accumulate power. In questions that concern the whole of Europe, a large power cannot dictate the majority made up of smaller states. This fear of one dominating state is evident when one looks at Turkey and its wishes for accession: one of the main reasons for Turkey not being granted membership is because of the number of inhabitants in the country is so large that they would be the largest power in the EU parliament[3].

Crossing game theory and IR theory, mainly Realism, is quite a new venture. Many writers argue that despite game theory being useful to explain certain situations in IR; it may make the analysis too simplistic. For example there is the debate on payoffs and how to determine what payoffs to use. To find payoffs one needs to analyse the actual relationship between Norway and the EU, to learn about the current situation, and how the relationship might have been if Norway had chosen to become a member of the EU. The latter is of course speculative. However by looking at the reasons for why the Norwegian people decided to decline membership and how the EU works today, we may get an insight into how membership might have been for Norway. One could then determine the payoffs using the game-tree that explains the relationship.

Snidal (1985) writes on how the traditional microeconomic criteria for a game can be adapted to a game in IR by relating basic criteria of analysing an oligopolistic market to counterparts in IR. The framework for this assumption comes from the fact that both firms and states act strategically, and that both rely on their own ability to do well in their respective environments. He also does the following comparisons to prove his point, and thus show that Economic Theory can be analysed as an Economic Concept as well (p. 32):

> Economic Marketplace ↔ International System
> Firm ↔ nation-state
> Firms Maximize Profits ↔ States Maximize Survival
> Oligopolists ↔ Great powers
> Market Concentration ↔ Concentration of Power
> Price Wars ↔ Military Wars

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[3] http://www.euractiv.com/en/enlargement/eu-turkey-relations-linksdossier-188294

This also shows how Realism and Game Theory are closely tied together. However it may be an idea to alter his 3<sup>rd</sup> comparison about firms maximizing their profits are equal to states maximizing their survival to firms maximizing profit is equal to states maximizing their power. This article was written in 1985, when the cold war was at its height and countries were aiming to survive. Today this has changed significantly to a position where a country's power not only guarantees its survival, but also gives the most powerful countries leverage to impose their will on other countries through sanctions or invasions. An example of this is the US lead invasion of Afghanistan and Iraq.

### 3. The relationship between Norway and the EU: finding payoffs.

In 1994 the Norwegian people voted no, for the second time on the question of joining the EU. The politicians were almost certain that Norway would join at that time; the economic rewards were just too great to ignore. According to the opinion polls the people would vote "Yes", just as they did in Sweden (14.August) a couple of weeks before. However, 52.2 percent[4] of Norwegians voted "No".  The fact that Norway did not join the EU meant that Norway was (and still is) in the unique position of being one of the richest countries in Europe, and at risk of being excluded from trading with the EU. Norway has always been (and still is) very dependent on trade with the Union. However the EU is not an excluding organisation, so the EU and three non EU-countries, Norway, Iceland and Lichtenstein, re-negotiated the European Economical Area agreement. Through this agreement both parts managed to negotiate mutually beneficial deals.

However, because the EU is as powerful as it is, European politics influence Norwegian society.
There are several treaties and agreements that give Norway a close cooperation with the EU in many areas, but mainly within the economic and political areas. EU policies influence therefore the majority of Norwegian society and European politics is high on the agenda. Together with Iceland and Lichtenstein, Norway (all formerly EFTA countries) has an economic agreement with the EU, through the European Economic Area agreement (EEA).The other major agreement I will look at in detail is the Schengen agreement.

### The EEA

The EEA-agreement has as its single most important purpose to make EUs inner market accessible for Norway and the other participating countries. The EU has reciprocating access to the markets of these countries. The EEA agreement states that trade; investments and migration should not be regulated at national borders. In effect Norway has renounced the right to favour its own domestic trade- to protect its own companies. The agreement

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[4] http://www.stortinget.no/om_stortinget/forfatningen/folkeavstemninger.html

runs for five years at a time. The importance to Norway of the EEA-agreement is illustrated by the facts that in 2005 about 80percent of Norway's exports went to EU and about 70 percent of imports came from the EU. [5] In this agreement Norway has agreed to impose EU regulations for approval of products (EC-marking etc), for competition and for government funding. The EEA agreement also regulates customs and trade limitations. However certain sectors have been excluded from the EEA-agreement such as regulations within agricultural and fishing production. However *trade* within those sectors is covered by the EEA agreement, because of its central role in the economy. The biggest and perhaps the most important difference between being a member of the EU and the EEA is that there are no supranational organs in the EEA. The relationship between the EU and the countries in the EEA is set on a national level (as opposed to supranational). Agreements are reached by unanimity, which means that the majority cannot bind the minority, and that new laws must be implemented by each country's governments. In contrast: if Norway had been a member of the EU, the decisions reached by the ministers or EU parliament would have had to be implemented into Norwegian law, even if the Norwegian representatives opposed the legislation. The EEA-agreement states that the three non-EU members have to contribute financially to reduce the economic and social differences in Europe. A new EEA agreement was signed in December 2009, where the EEA-contributors pledged to pay 357.7 million euro annually until 2014 or a total of 1.79 billion euro in total.[6] Norway still contributes 97% (ibid.).

Two logical explanations for the increase from 2004 to 2009 are, firstly the EU has expanded substantially, so the payment for the access to the inner market should increase proportionally. Secondly the current economic climate in the world leaves many countries in economic turmoil, and the Norwegian payments to the EU may help out. Another serious issue is that according to Miles (1996) the EU looks at the EEA agreement as inferior to its other internal agreements, so the "weaker" part of its administration is set to handle the EEA cases. One can interpret this as EU finding the EEA agreement as an inferior sphere of interest and attention, which will be further reduced if Island joins the fast track to EU-membership.

<div align="center">The Schengen-agreement</div>

Another very important agreement for Norway is the Schengen-Treaty. This cooperation started by 4 European countries in 1985 and extended in 2001 to include most of the then EU (excluding Great Britain and Ireland), is mainly about free movement of people between the participating countries. This means that if you travel from Norway to France through Sweden, Denmark and Germany (all are a part of the Schengen area) you do not have to stop at each national border to show your passport. The Schengen treaty is also important regarding immigration.

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[5] http://www.eu-norge.org/Norges+forhold+til+EU/aktiv+europapolitikk.htm
[6] http://www.eeagrants.org/id/1441

Through Schengen, visas for the whole area can be issued by one embassy of the member state. For example the German embassy in Morocco can issue a visa for the whole Schengen area. If the person applying for visa is unwanted in certain member-countries, then the visa can be issued exclusively for Germany.

Passport control and immigration control are strengthened at the outer limits of the Schengen area. This is especially important for, and a considerable drain on the resources of, Norway. This follows from the fact that Norway has an extremely long coastline, and at the same time has a common border with Russia.
One other very important function of the Schengen agreement is cooperation between the police forces of the participating countries and EUROPOL. This agreement makes it easier to institute a search (and inter-state extradition) for persons that have crossed borders within the Schengen-area. One important point is that the Schengen agreement will still be in play if Norway was to become a member of the EU. The agreement is not between the EU and Norway, but between many member states where some of the members are within the EU. In other words it is an intergovernmental organisation.

Other Agreements

If Norway was to restrict itself to the EEA and the Schengen agreements, there would be several areas it would be excluded from. Intergovernmental cooperation regarding security is a concern. In these days of international terrorism and military conflicts around the globe, and with Norway being situated between two superpowers, USA and Russia, there are demands for security-issues to be high on the agenda. Norway is a member of NATO and the UN. However, we have seen that for a politically strong power it is easy to push your own policies through as US did when they applied for support from the UN when invading Iraq. This makes a strong case for the EU and its member states to form a common policy and security force that can balance American and Russian power. The founding of the ESDP, the European Security Defence Policy, showed that the EU was concerned about this situation, and they felt that they had to do something. Norway's cooperation with the EU in this area comprises many bilateral agreements. There are traces all the way back to 1988 where the Norwegian foreign minister Thorvald Stoltenberg exchanged a series of letters with the German foreign minister Hans Dietrich Genscher regarding Norway's wishes to cooperate with (or be a part of) the EU-Army that was being planned. (Stortingsmelding nr. 23) Later many of the agreements were amended into the EEA-agreement, and Norway also made several agreements with the EU and their European Defence Agency.

The Nordic Council is also important. Norway's membership in the Nordic Council is voluntary and cannot be looked at as a treaty, but it is a very important institution that Norway may use as a tool to influence the EU. The other Nordic countries often share the Norwegian view in Europe, so Norway can act as an 'advisor' to Finland,

Sweden and Denmark. In the Nordic Council the countries gather together and debate on a wide range of issues: Fishing, Energy and Industry/Trade amongst others.

## The Relationship with the EU

These agreements make sure that Norway has one foot in the EUs economic market and political cooperation. At first glance it might appear that Norway benefits from the advantages of EU membership and is affected by none of the disadvantages by not being a member of the EU. For example, when it comes to the political work within the EU, it appears that Norway can choose to join in or not. A sort of an a-la-carte approach. This is wrong! There are several examples where Norway wants to cooperate with EU on certain issues, but the EU has said no, or the negotiations have simply taken too long. Good examples of this are to be found within military and security policy, and the justice sector, where it has taken years of negotiation to reach an agreement. This is due to the fact that Norway needs special allowances to be able to participate in the initiatives. These kinds of negotiations often take up more resources within the EU than they feel is appropriate for a country of Norway's size. Accordingly Norway's relative power of influence in the EU has declined over the last years due to EUs extension into Eastern Europe. The Eastern European nations now have a greater influence over the issues and agreements to be discussed and over which issues are to be taken forward.

In addition to this, Norway has to pay a considerable amount to the EU to be able to participate in talks regarding legislation etc. The amount of resources Norway has to use in lobbying and decision shaping is also a large obstacle to overcome. This is because Norway is not an EU-member and therefore not directly involved in the decision making processes.  Only member countries within the EU can join in and shape legislation or regulations. Very rarely do we find strong national-interests being ignored in the EUs regulation making process.
A huge disadvantage to Norway is when the EU are policy making. Norway can, if allowed, join in on the initial hearings regarding new policies. However when it is time to take these ideas forward into a policy, the drafting is transferred to the Commission, where Norway is not represented. There is no one to promote Norwegian national interests at the negotiating table.  The Commission prepares a draft regulation or law, and this is sent to the EU Parliament and the Council of Europe.

Norway is not represented here either, so again they depend on others to forward their case. Finally, when the bill is made into legislation, Norway can choose to implement it or not in accordance with the EEA. The problem here is they do not have much choice. If Norway decides to decline implementation, the EU can stop parts of the EEA-agreement. This will have dire consequences for Norway, so it is extremely rare that Norway refuses new legislation.

Norwegian diplomats or politicians can also take the initiative in informal work to try to influence the decision makers. Examples of this are through discussions in the Nordic Council or through agreements such as the one between the Nordic countries and Estonia regarding the ESDP. When the EU member states have agreed on a certain issue, whether it's a law or regulation, the case is looked at again in the EEA organs. At this point the members of the EEA can choose whether to implement the new legislation or not. However if they chose not to implement, the EU can retaliate by withdrawing its agreement (totally or partially) with the EEA-member states. For Norway that could mean a total halt in trade with the EU-member states, which will have huge economic consequences for the whole country. Should Norway defect from the agreements, EU can punish Norway by partly, or fully, withdrawing from the agreements. This would clearly hurt Norway more than EU, because 80% of Norway's export goes to the EU. This only makes up 4.02% of EU imports, whereas Norway imports 7.8% of everything EU exports.[7]

So realistically speaking, the Norwegian Government would do all it can to avoid using this right of reservation for fear of the consequences. Even in areas where Norway and the EU are in disagreement, the EU tends to use its muscles. For example disagreement concerning the methods used and the financing of salmon farming have resulted in the EU imposing punitive taxes on Norwegian salmon imports on several occasions. (Kinnucan: 2000) This highlights one of the disadvantages of not being a member of the EU, but at the same time still dependent of the Union. Norway is in reality forced to accept EU decisions, but they are not represented when policy making is being shaped. The fact that Norway pays a huge monetary price for not being a part of the EU is also very much an issue.

There is also the issue of the EU as a political arena, not only amongst the countries inside the Union, but as a political power as strong as the world's superpowers.

The EU is gradually becoming more important as a political forum where many political issues are addressed and decided. Foreign policy particularly regarding the war on terror in Afghanistan and Iraq is becoming more important, and here the EU has attained a high level of political agreement. This highlights the democratic deficit Norway is facing regarding the EU by not being a member of the EU Norway's access to these discussions is very limited. This is a huge dilemma for Norwegian politicians who are very engaged in multilateral cooperation in many areas. This shows that the issues Norwegian politicians want to discuss with the EU might overshadow NATO, leaving this military body where Norway is a member, limited to being an operations alliance.

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[7] http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tet00002&language=en

The political network that is needed by Norway to keep up with the EU core and try to influence policy-making is quite substantial. In addition to the Norwegian Delegation to the European Union- the governments delegation to the EU with representatives from every branch, there are six regional offices in Brussels, three NGOs, several organisations and a number of advisory offices as well.[8] This illustrates the sheer size of the Norwegian involvement with the EU. Another reason for this huge involvement is that Norway must keep themselves updated on an "as-soon-as-possible"-basis, so they can keep up with the EUs momentum.

This chapter has provided a detailed overview over the relationship between Norway and the EU. This makes it possible to find the payoffs to be used in the analysis. These will be revealed in the next chapter where the relationship will be explained through the use of game theory.

## 4. Analysing the relationship between Norway and EU using Game Theory.

As stated earlier, literature on the relationship between Norway and EU using Game Theory is virtually non-existent. Also the fact that this relationship is not exactly characterized by conflict also suggests that using existing games from the literature is difficult. This is because the payoffs in the different games do not correlate to the payoffs needed to explain the relationship between Norway and the EU. Games like the Prisoners Dilemma game and the Chicken Game will therefore not work well in this case because there is no ultimatum on the table from either. Nor is there any will to outperform each other, or try to beat each other. The best option for both parts is obviously cooperation, and that is why we have the agreements outlined in the last chapter. Also none of the parts are looking to defect on the agreements either. The EU has a reputation of being a fair and an honest organization which is out to produce maximum welfare for its members and associates. (Rittberger & Zangl, 2006)
As we demonstrated in the last chapter, Norway has every interest in cooperating with the EU. Defecting from the agreement would have large consequences economically.

The game used would be considered to be a one-shot game- this is because there is a very long time between the two referendums, 32 years[9].There were significant demographic changes and changes in the premises for EU membership. There are an increasing number of issues to consider. In 1972 the EU was vastly different from what it was in 1994, which again is very different from today. One example is the use of the Euro. If Norway were to become a member today they would have to agree to implement the Euro. If they had joined in 1994 they would have had the option not to adopt the Euro as UK did. Another issue to consider is the member states. In 1972 there

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[8] http://www.europaveien.no/index.php?option=com_content&task=blogsection&id=5&Itemid=87

[9] First referendum was held in 1972, the second in 1994. http://www.eu-norway.org/eu/

were 6 member states, 9 after the enlargement.[10] In 1994 there were 12 states becoming 15 after the enlargement. This meant that Norway would have had the possibility of having more leverage in its statements, and also had the possibility omitting certain implementations, like for example implementation of the Euro. Today there are 27 member states of which of many are economically underdeveloped compared to western and northern Europe. Membership in the EU would open Norway up much more that it is today, even with the EEA/Schengen agreements.

Since the Prisoners Dilemma Game and the Chicken Game were more appropriate in analysing conflicts, I discarded them. However the Stag Hunt game could be used. This is the entry game when adding a sub-game.
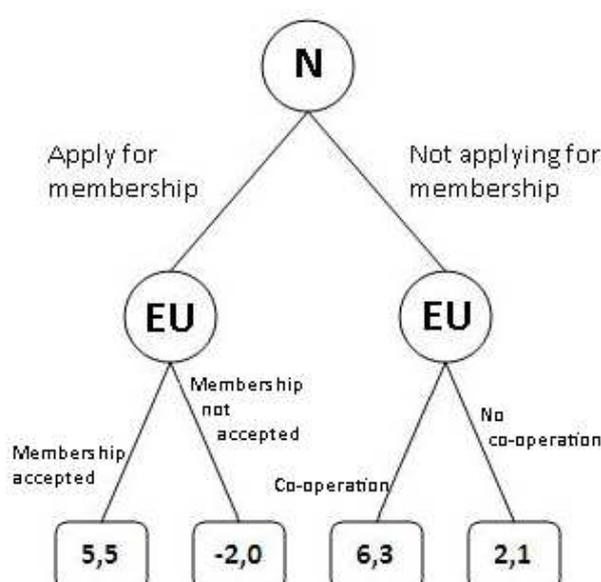


This game-tree is a sub game of the whole process. The whole process is much longer than this. Firstly Norway (N) has to decide on whether to inquire about membership to the European Union (EU) or not. Second stage would be for EU to inform Norway of the Criteria for accession. Then Norway would have to decide whether to accept these criteria or not. If they do accept the criteria we have a political will in favour of EU-membership. The politicians would then have to hold a referendum on the matter, and this is where the tree comes in.

The game tree above covers the EU refusing membership to Norway, even though this would probably occur earlier, it is a possibility and therefore must be included in the final matter. As Bennett (1995) commented in his journal, game theory is simplifying a complicated matter, to give an overview over the total case.

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[10] http://europa.eu/abc/history/1970-1979/index_en.htm

Firstly we have the situation where Norway applies for membership. EU has two options, to either accept Norway as a member or deny them membership. EU can deny accession to any applicant based on a number of issues. However there are a set of criteria, the Copenhagen Criteria[11], already set out as a guide for countries wishing to join.  In case of EU denying Norway accession, the payoffs would be   -2 for Norway because they would lose out on the agreements currently in place, and also they would lose the time and money spent on the pre-application debates and preparation. However, this is the least likely scenario because Norway does fulfil the criteria (Barroso, 2009) for membership.  If EU accepts Norway as a member, we have a win/win situation. Norway would gain open access to the EU market, and more importantly will not have the democratic deficit outlined in part 2. This would be a good situation for the EU. Not only would the country with the third highest GDP per capita after Lichtenstein and Luxembourg [12] join the Union, but a future energy-provider would also be secured in the market. In the case of the fish and oil debate, it is believed that the EU would probably have to accept some sort of agreement that lets Norway regulate foreign businesses that come to exploit those sectors (Hjellum, 2008). This is very important to Norwegians, and uncertainty in these sectors was one of the decisive factors when Norway voted not to join the EU in 1994. (ibid.)

If Norway decided to apply for membership and the EU accepted, the payoff would be 5,5. This is because EU could use less resources on the EFTA countries (Norway is behind 97% of the contributions[13]) and also would be able to secure access to the present petroleum market as well as the future energy-market. Norway would also gain a lot from membership. One thing is clear today, Norway would not go into a membership without keeping full control over its natural resources and keeping its currency. Secondly the democratic deficit Norway is facing would be reduced due to them being granted access to negotiations in the EU-Parliament. This option is the solution that creates the highest collective value.

Then we have the unlikely situation of Norway not applying for membership and the EU refusing to cooperate with Norway.  It is important to remember that cooperation here means to produce trade agreements like the EEA-agreement- not trade itself. Norway would be able to trade with countries within the EU on an individual basis. With no EEA agreement between them, EU and Norway would be able to impose export/import tariffs on each other's goods. This would make trade more difficult and expensive. Norway would probably increase its trade with other countries like USA, Canada and Russia. For EU it would probably not matter too much today, but it may be a future problem when increased import of energy would be needed. EU would not be able to impose regulations

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[11] http://europa.eu/scadplus/glossary/accession_criteria_copenhague_en.htm
[12] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html?countryName=Norway&countryCode=no&regionCode=eu&rank=5#no
[13] See chapter three.

onto the Norwegian consumer through the EEA-agreement. Norway and EU would gradually drift apart, jeopardising a future membership. The payoffs would therefore be 2,1.

Finally we have the situation we are in today.

This is where Norway rejects membership and the EU accepts cooperation. This way Norway keep full control over its natural resources, run its own taxation policies and also have an opt-out option for EU legislation. However, we must not forget that the price paid for this "freedom" is the democratic deficit and the vast economic costs of the EEA-agreement: an agreement Norway is dependent on. To the EU this option is not optimal, but acceptable. It is the best when looking at the options they had when Norway turned down membership. Through this cooperation EU remains a close trade-partner to Norway where the trade barriers have gone. EU receives a significant contribution of funds to even out the difference between rich and poor within the union. Also it is likely that even without a future membership- even though membership is always an option- EU is most likely to be able to trade energy in the future. This is a good option for the EU, but not the optimal, because there is the threat of Norway pulling out if the costs of the agreements exceed the benefits.

Looking at the game-tree, it seems that the optimal solution is that Norway becomes a member of the EU because the total payoff would be 10, or 5 each. One way to determine the optimal solution, or the "*subgame perfect Nash equilibrium*" under the conditions given is through backwards induction working from the bottom of the game tree upwards.(Monet, Serra 2003) Firstly we look at the payoffs and determine what the EU would choose in both cases where Norway apply for membership or not. We can then see that EU would grant Norway membership or choose to cooperate, this because the payoffs in these choices are dominant to the alternative. We have therefore eliminated the fact that Norway faces the threat of being denied membership or EU refusing to cooperate.
The next step would be to determine Norway's action on the background of the remaining alternatives we found in the first step. Looking at the payoff alternatives for Norway, for membership in the EU the payoff would be 5 and for not applying for membership would be 6, Norway would therefore not become a member of the EU because we can be certain that the EU would cooperate. The game tree would therefore look like this:
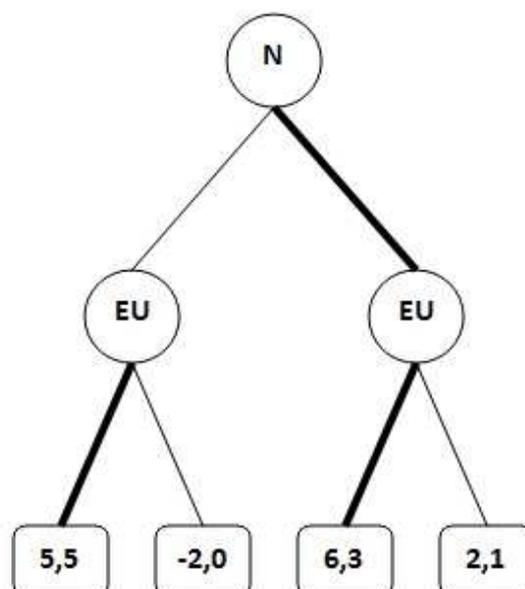
One can see how the EU can influence Norway's choice to either apply for membership or not by not cooperating with Norway or by increasing Norway's payoff under membership. The third, and most realistic way, is for EU to lower Norway's payoff when they cooperate but no membership. It is evident that this is the way EU is "pressuring" Norway today when one looks back at the EEA agreement and how the price of cooperation is increasing. The EUs reasoning for this is because the EU market is expanding, but the new EU markets are realistically not targeted by Norway with the exception of a few banks- who incidentally have seen huge losses because of the expansion into the Baltic States[14].

Following this we can see that the EU would benefit the most *if* Norway were to become a member, but because Norway decided not to become a member, cooperation was the best option at that point.

When taking a stag-hunt game approach in comparing long- and short term benefit, we can see that the game-tree can be divided in two. Due to the politics of EU membership, and the fact that Norway can apply (and have referendums) for membership several times, one can consider the right half to be a Short Term solution, resembling the hunter going for the hare and not the stag in the Stag Hunt Game.

If Norway was to apply for membership, we have a Long-term solution: It is very difficult to get out of an EU membership, if not impossible.

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[14] http://www.dn.no/forsiden/borsMarked/article1885752.ece

This may be something the EU has realised, so they are now increasing the price of membership to try to influence Norway to become a member, however Norway has said "no" twice before. There is also the risk that they will decline cooperation. Both would lose out (payoff 2,1), but when cornered, what is the rational solution? Norway may follow the Swiss model, and only part-trade with the EU. Then the EU will lose out on valuable trade and access to the future energy-market. Is this a risk they are willing to take? According to the game-tree the answer is no.

To find the Nash-Equilibrium it is more convenient to use a game-matrix. The matrix derived from the game-tree would look like this:

<div align="center">

European Union

|  |  | Accept/Co-operate | Not Accept/<br>Not Co-operate |
|---|---|---|---|
| | Apply | 5,<u>5</u> | -2,0 |
| Norway | Not<br>Apply | <u>6,3</u> | <u>2</u>,1 |

</div>

We can see that the best strategy for the EU is to cooperate with Norway whether they apply for membership or not. For Norway, the best option is not to apply. The Nash Equilibrium is therefore for Norway not to apply but for both parts to cooperate. Interestingly, there are no Pareto-efficient solutions to this matrix- we cannot find any situation where the total payoff is the highest and both players are better off- one would need to change the payoffs in that case. This can be done in two ways:

EU granted Norway a membership with the terms that Norway would keep full control over its natural resources. This would increase the payoff for Norway, and membership would be very likely.

The Matrix would then look like this:

European Union

|  | Accept/ Co-operate | Not Accept/ Not Co-operate |
|---|---|---|
| Norway — Apply | 6,5 | -2,0 |
| Norway — Not Apply | 5,3 | 2,1 |

We can also see that the NE changes to Norway applying for membership and EU to accept Norway.

The other way would be to reduce Norway's payoff in today's case. By increasing the economic terms for cooperation, Norway may be inclined to choose differently, (almost forced). However, EU must be careful not to reduce the payoff too much so non cooperation becomes an alternative for Norway.

European Union

|  | Accept/ Co-operate | Not Accept/ Not Co-operate |
|---|---|---|
| Norway — Apply | 5,5 | -2,0 |
| Norway — Not Apply | 4,3 | 2,1 |

Again the NE would be for Norway to apply and for EU to accept, but the total payoff would not increase. The Pareto efficient solution would therefore be for EU to agree to Norway's wishes to control its natural resources.

Credible and non-credible threats.

When looking at the game tree and the payoffs, it is clear that in one certain situation it is possible for the EU to force Norway into cooperation. For example, EU could say to Norway that they would not consider cooperating with Norway if Norway refused to become a member. This would eliminate the payoff of 6 for Norway and therefore Norway would pursue membership to get the payoff of 5. However this is considered to be a non-credible threat. We can see from the EUs payoff that they would only cooperate if Norway chose not to become a member

because of the bigger payoff for cooperation. However, a non-credible threat may seem threatening enough because Norway may fear that the EU could act irrationally and refuse cooperation.

## 5. Conclusion.

In this dissertation we have examined the relationship between Norway and the EU. What is unique with this relationship is that while both wish to cooperate with each other, they are divided in the way it should be done. The EU obviously feels that Norway should become a member of the organisation, whilst Norway believes that not being a member but relying on trade agreements is the best solution.

By analyzing this relationship using game theory we have received some valuable insights and we can explain much of how the relationship can be developed. We have learned that even though EU is the more powerful of the two parts, Norway dictates the way the relationship is evolving because of EU uncertainty. They cannot decide on what course of action they ought to take before Norway has decided to become a member or not. Through backwards induction we have seen that the optimal solution for both is that Norway becomes a member. Due to the higher payoff for Norway not to apply for membership and the fact that the threat of the EU not to cooperate is non-credible, Norway would pursue the higher payoff and not become a member.

This solution is also verified when we plot the payoffs in a matrix and find the Nash Equilibrium.
We can also see that because the threat of EU refusing to cooperate is a non-credible threat, there is two ways for the EU to influence the Norwegians to become members. The two solutions are either to increase the payoff for Norway if they become members, or to reduce the payoff for cooperation. Looking at how the EEA-agreement has evolved, it is clear that it is the latter that is happening. The price for cooperating with the EU is going up; therefore the result is that Norway is left with a reduced payoff. However, it may be easier for the EU to increase the payoff for Norway's membership. However this will then influence EU's payoff because of Norway's wish for total ownership of its own natural resources and therefore the EU will lose out on that.

Looking at the benefits of being a member versus membership using game theory shows us that it is a difficult relationship. In the true spirit of realism and game theory both parts want to gain maximum benefit out of the situation they face when it comes to cooperation. What is also clear is that EU can try to force through a Norwegian membership IF they are willing to gamble on Norway applying rather than accepting non cooperation. Realistically that will not happen. Norway and the EU are both tied up to cooperation through the EEA agreement, Schengen agreement and other agreements. Also considering the level of implementation of EU politics regulations within

Norwegian law suggests that cooperation has reached such a level that only a Norwegian EU-membership is realistic if the status quo were to change.

However, with the bad press the EU has received lately because of the problems in the Euro-zone and the way the crisis has been handled, the latest polls on whether Norway should become a member of the EU or not has changed since the last referendum. The new numbers show that 61.8% want Norway to stay outside EU, whilst 26.3% want membership[15]. (11.9% is undecided)

However this type of polls is only presented as an indication and is in no way representative of the results in a referendum. But it does suggest that the payoff for Norway becoming a member is decreasing, which might be a problem to the EU in the future when/if a new referendum is on the table. This is something only the future will show.

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[15] http://www.nationen.no/2010/08/15/politikk/eu/statistikk/meningsmaling/6109081/

# 6. Bibliography:

Books and Journals

Archer Clive (2005) *Norway and European integration from 1994 to 2004,* Routledge

Bennett, Peter G (1995) *Modelling Decisions in International Relations: Game Theory and Beyond* Mersham International Studies Review 39:19-52


Bergesen H O, Østreng W 2005 *Internasjonal Politikk* Aschehoug

Claes Dag Harald, Førland Tor Egil (2007) *Europeisk Integrasjon* Gyldendal

Canzoneri Matthew B, Henderson Dale (1991) *Monetary Policy in Inderdependent Economies: A Game Theoretic Approach* MIT, London


Correa Hector (2001) *Game Theory as an Instrument for the Analysis of International Relations* The Ritsumeikan Journal of International Studies 14 187-204


Cremona Marie (2003) *The enlargement of the European Union* Oxford Uni Press

Grindheim Jan Erik, Trondal Jarle (2007) *Europeisk Integrasjon og Regional Endring* Fagbokforlaget


Grobe Christian (2010) *The power of words: Argumentative persuasion in international negotiations* European Journal of International Relations 16:6-29


Heidar Knut (2000) *Norway: Elites on Trial* Westview

Hovi Jon, Underdal (2003) *Internasjonalt Samarbeid og Internasjonal Organisason* Universitetsforlaget


Hjellum Torstein (2008) *Den Norske Nasjonalstaten* Cappelen

Ingebritsen Christine (1998 *The Nordic States and European Unity* Cornell Uni Press

Jenssen Anders Todal, Pesonen Pertti, Gilljam Mikael (1998) *To join or not to join* Scandinavian Uni Press


Jervis, Robert (1978) *Cooperation under the Security Dilemma* World Politics 30:167-214


Kinnucan, H.W., & Myrland, Ø. (2000). *Optimal advertising with application to the Norway-EU Salmon Agreement*. European Review of Agricultural Economics*, 27*: 39-58.


Malnes Raino, Midgaard Knut (2003) *Politisk Tenkning* Universitetsforlaget

Miles Lee (1996) *The European Union and the Nordic Countries* Routledge

Montet Christian, Serra Daniel (2003) *Game Theory and Economics* Palgrave Macmillan

Mulford Matthew, Berejikian Jeffery (2002) *Behavioural Decision Theory and the Gains Debate in International Politics* Political Studies 50:209-229

Rapoport, Anatol (1974) *Game Theory as a Theory of Conflict Resolution* D.Reidel Publishing Company, Boston USA.

Rittberger Volker, Zangl Bernhard (2006) *International Organisation* Palgrave

Signorino Curtis S. (2002) *Strategy and selection in international relations* International interactions 28:93-115

Snidal Duncan (1985) *The Game Theory of International Politics* World Politics 38:25-57

Snyder Glenn, Diesing Paul (1977) *Conflict Among Nations: Bargaining, Decision Making, and System Structure in International Crises* Princeton University Press

Stirk Peter, Weigall David (1995) *An introduction to Political Ideas* Pinter

Viotti Paul R, Kauppi Mark V. (2007) *International Relations and World Politics* Pearson Prentics Hall

Viotti Paul R, Kauppi Mark V. (1999) *International Relations Theory* Allyn and Bacon

Arena.uio.no: Norway: Insider AND Outsider http://www.arena.uio.no/publications/wp00_4.htm accessed on 6/6/2010

CIA World Factbook: Norway https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html?countryName=Norway&countryCode=no&regionCode=eu&rank=5#no accessed on 1/7/2010

Dagens Næringsliv: DnB Nor-tap: 6,7 milliarder http://www.dn.no/forsiden/borsMarked/article1885752.ece accessed on 1/7/2010

E24.no: EU krever milliarder fra EU http://e24.no/makro-og-politikk/article2897263.ece Accessed on 12/6/2010

Eegrants.org: €1.79 billion to reduce economic andsocial disparities in Europe http://www.eeagrants.org/id/1441 accessed on 12/6/2010

Euractiv.com http://www.euractiv.com/en/enlargement/eu-turkey-relations-linksdossier-188294 accessed on 21/6/2010

Europaveien.no: Norge og EU (an overview over cooperation between Norway and EU) http://www.europaveien.no/index.php?option=com_content&task=blogsection&id=5&Itemid=87 accessed on 15/6/2010

Europa.eu: Glossary: Accession Criteria http://europa.eu/scadplus/glossary/accession_criteria_copenhague_en.htm accessed on 6/6/2010

Europa.eu: history 1970-1979: http://europa.eu/abc/history/1970-1979/index_en.htm accessed on 6/6/2010

European Commission: Enlargement http://ec.europa.eu/enlargement/index_en.htm accessed on 7/6/2010

Eurostat: External trade, by declaring country, total product http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tet00002&language=en

accessed on 12/6/2010

EU-Delegasjonen (Norwegian EU-deegation): http://www.eu-norge.org/Norges+forhold+til+EU/aktiv+europapolitikk.htm accessed on 5/6/2010

Håndbok i EU/EØS-arbeid (Distributor: Utenriksdepartementet): http://www.regjeringen.no/nb/dep/ud/aktuelt/nyheter/2009/haandbok.html?id=542432 accessed on 7/6/2010

International Herald Tribune: In Norway, EU pros and cons (the cons still win) http://www.iht.com/articles/2005/10/26/news/norway.php accessed on 2/7/2010

Javno.com: Norway could join EU tomorrow of it wants http://www.javno.com/en-world/norway-could-join-eu-tomorrow-if-it-wants--barroso_126742 accessed on 2/7/2010

Nationen.no:  Mer enn 60 prosent sier nei for tredje måned på rad (over 60 percent says no third month running) http://www.nationen.no/2010/08/15/politikk/eu/statistikk/meningsmaling/6109081/ accessed on 16/6/2010

Stortinget- Folkeavstemninger: (Norwegian government- Referendums) http://www.stortinget.no/om_stortinget/forfatningen/folkeavstemninger.html

The EEA webpage: www.eea.europa.eu accessed on 7/6/2010

Utenriksdepartementet (Ministry of Foregin affairs) http://www.regjeringen.no/nb/dep/ud.html?id=833 accessed on 6/6/2010