Explaining the Cooperative Nature of Norwegian-Russian Petroleum Relations in the High North: A Game Theoretical Analysis

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Abstract

In this thesis, I consider the following research question: *Why have Norwegian-Russian petroleum relations in the High North remained cooperative?*

Petroleum cooperation between these two states in the High North has not always been straight-forward and predictable. However, cooperation within this area and in this region has been more stable and successful than general foreign- and security policy cooperation between Norway and Russia. Furthermore, cooperation between Norway and Russia has been more successful than cooperation between Russia and the West more generally. It is this paradox that provides the main puzzle for my thesis.

In this game theoretical analysis, I seek answers to my research question by employing two separate hypotheses. These hypotheses are then tested via the Varangerfjord Agreement of 1957, the Grey Zone Agreement of 1978 and the Delimitation Agreement of 2010. These agreements have been chosen because they are three of the most documented examples of negotiations taking place between Norway and Russia in the High North. They also represent the resolution of a delimitation dispute over time. Furthermore, the signing of the Delimitation Agreement of 2010 came as a surprise to many, and it is therefore worthwhile to scrutinize why this dispute was solved at this particular time and which factors helped facilitate this successful outcome.

Any negotiation may have an outcome ranging from total disagreement, on the one hand, to complete agreement, on the other hand, and different degrees of ambiguity in between. Further, there are several side-effects of the process leading to the settlement that has nothing to do with the agreement between the two states, but rather deal with third parties, international publicity, and so on (Iklé 1964: 59). Had I attempted to combine all these heterogeneous factors, the negotiating process would have seamlessly intertwined with the field of international relations. However, such an approach is not possible. It is therefore essential to focus only on the question of why the particular negotiation process lead to the agreement under investigation. Following this method, I find that a combination of mutual interests in the region and petroleum interdependence help make this relationship cooperative.

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Any mistakes that remain are my own.

Table of contents

Abbreviations

AC	Arctic Council
BEAC	Barents Euro-Arctic Council
CARA	Circum-Arctic Resource Appraisal
CLCS	Commission on the Limits of the Continental Shelf
EEZ	Exclusive Economic Zone
EU	European Union
GDP	Gross Domestic Product
IEA	International Energy Agency
LNG	Liquefied Natural Gas
NATO	North Atlantic Treaty Organisation
NMFA	Norwegian Ministry of Foreign Affairs
NMPE	Norwegian Ministry of Petroleum and Energy
NPD	Norwegian Petroleum Directorate
OPEC	Organisation of Petroleum Exporting Countries
PD	Prisoner's Dilemma
SDAG	Shtokman Development AG
SH	Stag Hunt
SU	Soviet Union
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	United Nations Framework Convention on Climate Change
USGS	United States Geological Survey

List of figures

1 Introduction

This chapter will introduce the reasons why it is worthwhile investigating the cooperative petroleum relationship between Norway and Russia in the High North, and the research question at hand. This chapter will then explain the research design of the thesis, including which data, method and hypotheses have been evaluated. The final part of this chapter will highlight the contribution this thesis makes to the existing literature on the topic, and outline how the rest of the thesis will be structured.

The Norwegian government has put the High North at the top of its foreign policy priorities since 2005 (Jensen and Rottem 2010: 75; Jespersen and Vestergaard 2015: 37; Keil 2014: 174; The Norwegian Ministry of Foreign Affairs 2006) and will continue to do so in years to come (Orheim 2006: 29; The Norwegian Ministry of Foreign Affairs 2011). In its Arctic Strategy paper, the Norwegian Ministry of Foreign Affairs (NMFA) outlines that it will "work to increase the positive local and regional spin-off effects of oil and gas activities" and continue to grant oil and gas "licenses on an annual basis in predefined areas" (2017: 24). This part of the Norwegian High North strategy seeks to expand and improve Norway's position in the international oil and gas market. Norway considers the resources in the Barents Sea to be decisive in this regard, as the resources here are strategically well-positioned relative to supply the rest of Europe. The Norwegian government therefore wants to follow an active policy for the issuance of exploitation licenses, so that both existing and potential future areas are explored (Jespersen and Vestergaard 2015: 37).

Further, a whole section of this policy document is devoted to Norway's cooperation with Russia, where it is made clear that Norway needs to work together with Russia "to address key challenges" regardless of "Russia's violations of international law in Ukraine and Norway's response to these" (NMFA 2017: 18). Therefore, while the Norwegian-Russian relationship will never be completely independent of the wider Russian-Western relationship, it is neither completely reliant on it. In fact, parallel to Russian-Western relations souring, Norwegian foreign policy towards Russia has experienced a de facto re-centralization (Bourmistrov, Anatoli et al. 2015: 20). The fact that cooperation between Norway and Russia has been more successful than cooperation between Russia and the West more generally is a puzzle that demands investigation.

1.1 Research question

This thesis considers the following research question:

Why have Norwegian-Russian petroleum relations in the High North remained cooperative?

The main puzzle of my thesis is what helps maintain the cooperative relationship between Norway and Russia in the High North, in relation to petroleum policy. Specifically, I want to examine the relationship between Norway and Russia because of their differences in size, power, regime type and so on (Hønneland and Jensen 2008). Furthermore, Norway and Russia have long been among the most active actors in the region, which makes me wonder how these coastal states influence each other's petroleum strategies, if at all (Zysk and Titley 2015; Øverland 2010).

Perhaps the most important reason for the High North's position in Norwegian foreign policy is the area's potential for becoming an important future petroleum province (Jensen 2010: 295). This petroleum potential is still a key feature of Norway's Arctic Strategy, and has been since the High North Strategy was first published (Norwegian Ministry of Foreign Affairs 2006: 11; 2009; 2011; 2017: 23; Norwegian Ministry of Petroleum and Energy 2011).

Aside from what is listed in the various official documents outlining Norway's strategy in the High North, Norway's petroleum strategy in this region will be defined by the Norwegian Ministry of Petroleum and Energy (NMPE). The overarching goal of this ministry is to ensure high wealth creation through the efficient and environmentally sound management of energy resources. Furthermore, cooperation between Norway and Russia in the High North will, throughout this thesis, be defined and measured as areas that are opened for exploration and the propensity to settle delimitation disputes.

Although much has already been written on the topic of petroleum policy in the High North, regarding both Norway and Russia (Alagic 2009; Dingman 2011; Gottemoeller and Tamnes 2008; Rowe 2014; Slee 2015; Sveberg 2012; Weisser-Svendsen 2007), I have yet to come across a scholarly work that incorporates a game theoretical framework to the analysis and builds on insights from realism.

1.2 Research design

The starting point for my research design is as follows: by exploring Norwegian and Russian interests in the High North using game theory, while keeping in mind the cooperative nature of their relationship, I will increase my chances of finding a comprehensive answer to the research question. This section will introduce my data, theory and method, explain my hypotheses and highlight the contribution of my thesis. The use of any method, however, requires scrutiny. A discussion of the limitations of game theory and how to potentially overcome them will therefore be the purpose of chapter 2.

Data

This thesis will use document analysis as its main data base (Jensen 2010: 186). The primary sources consist of a selection of official documents and statements available from relevant Norwegian ministries and directorates (The Norwegian Ministry of Foreign Affairs, the Norwegian Ministry of Petroleum and Energy, and the Norwegian Petroleum Directorate). The secondary sources comprise of industry and academic literature on the topic. This data will be analysed with the two hypotheses mentioned below in mind. By incorporating insights from the realism literature and taking into account the properties inherent in game theory, I will seek answers to my research question.

Two key challenges became apparent in terms of data collection. Firstly, decision makers do not necessarily express the true intentions behind any policy decisions they make. It is therefore necessary to consider the purpose a statement or document intends to serve, and under what circumstances it was formulated, as official information may be selectively released to fit political interests. Secondly, some Russian sources were not available to me given that their access was restricted, or they were only available in Russian. However, by finding official Russian Arctic strategy documents in English and also reading about these documents extensively through secondary sources, the hope is that this inconvenience has not had a major impact on my thesis formulation.

Theory

This thesis will use realism as its main international relations (IR) theory in trying to explain the cooperative petroleum relationship between Norway and Russia in the High North. Realism is a respected theory about international politics that attempts to explain both the behavior of individual states and the characteristics of the international system. The ontological reasoning given for realism is that sovereign states are the main components of the international system and sovereignty is a political order based on territorial control. The international system is therefore anarchical and characterised by self-help. Sovereign states are rational actors concerned with relative gains because they must function in an anarchical environment in which their security and well-being ultimately rests on their ability to mobilise their own resources against external threats. For realists, then, "the basic explanation for the behavior of states is the distribution of power in the international system and the place of a given state within that distribution" (Krasner 1992: 39).

If such realist reasoning is correct, states will, in the long-run, conform to the pressures stemming from the international system. If not, they will be conquered or experience lesser forms of deprivation. In the short run, nonetheless, states may fall short of their realist aspirations. Normatively, realists warn against policies that attempt to do a lot or very little and are unable to align commitments with capabilities. This is true for all states whether they are extremely powerful in the international system or possess very few resources. However, realists, like advocates of other social science theories, recognise that policymakers will not always act according to realist precepts. Finally, although realism is not incompatible with democracy, it is not profoundly connected with democracy either (ibid, 41-50). This theory can, as a result, be used to understand Norwegian as well as Russian behavior and intentions in the High North, and illustrate why these two states choose to cooperative on petroleum matters in this region.

Method

At its most basic, game theory is "about anticipating each other's choices" and coping "with influencing other's choices" (Schelling 2010: 27). In this respect, a "game" is any situation in which several players have to make decisions that depend on results that affect them all. Chess or poker are classic examples of such situations, but the definition is broad enough to cover phenomena such as military conflict or economic competition. The foundations of decision theory are therefore dependent on the fact that a player must make their tactical move based on the extent of its consequences. Each consequence will subsequently depend not only on the player's own decision, but on his or her opponents' decisions. In most real-life cases, consequences associated with moves also depend on external factors, such as the international context, whose uncertainty is obvious (Attali 1972: 78).

If one equates game theoretical models to King, Keohane, and Verba's (1994) four characteristics of scientific research, it becomes clear that game theory belongs within the realm of social scientific research, and political research more specifically. These four characteristics are outlined below:

1. *The goal is inference*. The deductive logic employed by these techniques aim to provide an explanation for various aspects of social interactions, ranging from general principles to specific inferences.
2. *The procedures are public*. The rigor of formal analyses and the explicit presentation of assumptions make this a public undertaking.
3. *The conclusions are uncertain*. Game theoretic models are especially good at providing unexpected results. In this way, the formal structure of such models often help to challenge conventional wisdom.
4. *The content is the method*. Game theoretical models are characterized by a set of specific rules that guide the procedure by which a political phenomenon is analysed (Gates and Humes 1997: 6-7).

The game theoretical design incorporated into my thesis is in line with the economics literature on repeated games, with a focus on infinite games (Dixit, Skeath, and Reiley 2015). Repeated games are those in which a fixed set of players, Norway and Russia in this case, play the same game against each other several times. The hope is that if players play this game an infinite number of times, they will be able to sustain a cooperative outcome, as this

will be in the interest of both players. However, this is a contingent strategy because it specifies how a player will play dependent on how the opponent behaves in the game. In short, the literature explains that the possibility of cooperation in repeated games depends largely on three criteria. These include how patient players are, the actual magnitude of the payoff that players obtain from the various possible outcomes, and the length of the game (Glaser 1995: 82).

Schelling's discoveries relating to scenarios where a mix of conflict and mutual interests preside in game theory, can be applied to a situation where interests are largely aligned by way of tacit coordination. This can be said to be the case when it comes to Norwegian-Russian petroleum relations, as these states have significant mutual interests in the High North. As such, pure coordination is a game of strategy equivalent to a strategy of conflict. Imagine a game in which each player's best choice depends on the action he expects the other player to take, which he knows depends on what the other's expectation of his own move is. Such interdependence of the expectations of players is what separates a game of strategy from a simple game of chance or skill. In such circumstances, players' convergence of expectations is crucial in order to create focal points that normally arise out of considerations that have their foundation outside the pure formalities of the game (Dixit 2006: 220-1).

Several models could have provided the analytical backdrop for this thesis and the research question chosen, but game theory has been selected mainly because of its previous use in political science works and to bring the disciplines of economics and political science closer together. Employing a game theoretical framework, this thesis will evaluate the two hypotheses outlined below against the negotiations leading up to the Varangerfjord Agreement, the Grey Zone Agreement and the Delimitation Agreement. These agreements have been chosen because they are all significant from a petroleum policy perspective. However, rather than being a case study analysis, this thesis will use the three agreements outlined above as examples of why the hypotheses chosen can help explain why Norwegian-Russian petroleum relations in the High North have remained cooperative.

Hypotheses

In light of my literature review and the insights obtained from realism and game theory, I have developed two main hypotheses regarding my research question, and these are as follows:

H_1: Norwegian-Russian petroleum relations in the High North have remained cooperative because of mutual interests in the region

H_2: Norwegian-Russian petroleum relations in the High North have remained cooperative because both states can benefit from the others' petroleum resources and expertise

The hypotheses outlined above are based on the data collected and the agreements looked into. To exemplify, Roberts writes that Russia will likely play by the rules in the High North, citing that Russia's High North interests are best addressed through diplomacy (2015: 125). Furthermore, she importantly identifies that the High North is not Ukraine or Crimea, and that the heightened Western mistrust of President Putin should therefore not be transferred to Russia's dealings in the High North, as the stakes are high and the historical context matters (ibid). Such arguments are also interesting given that Norway's Arctic strategy stresses the need for cooperation with Russia, almost regardless of Russia's condemned actions in Ukraine and elsewhere (NMFA 2017: 18).

Correspondingly, Staun explains that Russia has so far followed a non-assertive foreign policy in the High North because of its desire to eventually exploit the resource and sea route potential in the region (2017: 328). Similar views are also echoed elsewhere in the literature, with a focus on Russia's long-term desire to establish itself as an energy superpower confidently able to supply its large European energy market (Bouzarovski and Bassin 2011; Godzimirski 2011; Monaghan 2007; Tayloe 2015: 9). Given that these hypotheses are not mutually exclusive, they may act together to explain the cooperative petroleum relationship between Norway and Russia in the High North. Equally, because they do not cover all possible explanatory factors, none of these hypotheses may be able to fully explain why this cooperative relationship exists and has persisted over time.

Contribution of the thesis

This thesis is situated between two fields of research: one is concerned with the wider issues pertaining to the High North, such as petroleum, fisheries, climate, indigenous peoples, and so on. The other field is concerned with Norwegian-Russian relations, as well as foreign and security policy. By combining these two fields of research, all the while incorporating a game theoretical approach, I hope to bring these different social science disciplines closer together.

Examining Norway and Russia's High North relations via a game theoretical analysis adds another dimension to the discourse analysis, making my thesis interdisciplinary. The hope is that the application of this framework to the literature will, alongside the insights provided by realism, help shed some light on the reasons why Norway and Russia do cooperate on petroleum matters in this region, and which variables make a difference to this relationship (Bourmistrov et al. 2015). This is particularly interesting given the complex political dynamics between these two petroleum players and the wider relationship between Russia and the West (Granovetter 1985; Uzzi 1997).

1.4 Thesis outline

This thesis consists of seven chapters of which this introduction constitutes the first. Chapter 2 will delve into the limitations of game theory as a framework for analysis. The main features of game theory that will be discussed include weaknesses relating to rationality, Nash equilibrium, the inability to monitor, utility functions, and repeated games. This is not an exhaustive list of weaknesses inherent in this framework, but rather an attempt to highlight some of the most troublesome features of this approach.

Chapter 3 will provide some historical background on the cooperative petroleum relations between Norway and Russia in the High North, and give an overview of key points from the relevant literature. This chapter is divided into seven key headings, which highlight significant issues or features of the literature on this topic. These headings include 'Definition of the High North', 'The harsh climate of the High North', 'The importance of access to

petroleum resources', 'Potential petroleum reserves in the High North', 'The issue of climate change', 'Russia's High North strategy' and 'Russia's relationship with the West'.

Chapter 4 will deal with H_1 to scrutinize this possible explanation for the petroleum cooperation between Norway and Russia in this region. This chapter will discuss the hypothesis stating that Norwegian-Russian petroleum relations in the High North have remained cooperative because of mutual interests in the region. First, mutual interests between these two states will be evaluated. Then, potential conflicts of interest between Norway and Russia will be highlighted. The chapter will end with an analysis of how game theory fits with this hypothesis.

Chapter 5 will deal with H_2 to scrutinize this possible explanation for the petroleum cooperation between Norway and Russia in this region. This chapter will discuss the hypothesis stating that Norwegian-Russian petroleum relations in the High North have remained cooperative because both states can benefit from the others' petroleum resources and expertise. The chapter will begin by evaluating the state of petroleum developments today. Russian dependence on Norwegian petroleum technology will then be discussed. Next, Norwegian dependence on Russian petroleum fields will be considered. This chapter will end with an analysis of how game theory fits with this perceived petroleum interdependence.

Chapter 6 will analyze the cooperative petroleum relationship between Norway and Russia in the High North by means of the Varangerfjord Agreement, the Grey Zone Agreement and the Delimitation Agreement. These agreements have been chosen because they build on each other from a time perspective. Although they were initially intended to relax tensions between Norwegian and Russian fishing vessels operating in this area, these negotiations were also influenced by both states' hope to eventually explore and extract petroleum resources on the Arctic seabed. This chapter will start off by explaining how negotiations can be viewed through the lens of game theory and then proceed to discuss the three agreements mentioned above in chronological order.

The ordering of chapters 4-6 is not random, but rather signifies the respective chapters' importance to the thesis formulation. Rather than being a case study analysis, this thesis hopes to shed light on some of the factors that may help explain why Norwegian-Russian petroleum relations in the High North have remained cooperative. Therefore, chapter 6, which discusses

previous important agreements between Norway and Russia in the High North, is intended to exemplify how game theory can be used to make the case for mutual interests or petroleum interdependence as explanatory variables. In other words, this thesis will not use these three agreements as cases to be explained via game theory, but rather as examples of how the hypotheses chosen can help explain why Norwegian-Russian petroleum relations in the High North have remained cooperative.

Chapter 7 will provide a discussion of the previous chapters and concluding remarks. This final chapter will start by discussing the main findings of the two hypotheses analysed in relation to the agreements presented. Further, this chapter will highlight the implications of the main findings and evaluate which other variables could have been hypothesized to explain this bilateral relationship. After, suggestions will be given for further research relevant to the research question. This chapter will then highlight how, if attempted again, this thesis formulation could have been executed differently. This final chapter will end by providing concluding remarks.

2 Limitations of game theory

Game theory has become popular in works of political science because of its ability to use mathematical language to model strategic interactions between players (Morton 1999: 82). Nevertheless, game theory, like any method, has its limitations. This chapter will discuss the most striking of these limitations, and how they may impact the conclusions drawn in relation to the research question at hand.

Although game theory predictions often work well, not all of them are confirmed by experimental evidence. Weaknesses often alluded to when talking about game theory are those related to rationality, Nash equilibrium, the inability to monitor, utility functions, and repeated games. This is not an exhaustive list of weaknesses inherent in this framework, but rather a way of underlining the main issues associated with using game theory for political science questions.

2.1 Rationality

Perhaps the most important assumption of players in game theoretical situations, is their rationality. In this respect, players in games are supposed to be instrumentally rational. This means that they will most likely act in their own self-interest and have the ability to probabilistically determine the outcome of their own actions. The overriding assumption in game theory is that each player in a game is a pure egoist, only concerned with maximizing their own payoff (Taylor 1987: 109). Given the complexity of most decisions, and the sheer volume of information that needs to be analysed by players, this assumption of rationality appears unrealistic. This is as the use of instrumental rationality by individuals may serve to be self-defeating. Players may, in fact, protect their own self-interest better if they act in ways not deemed to be instrumentally rational. Secondly, the solution to a game based on instrumental rationality is often indeterminant. When such a scenario is present, non-rational considerations must be added to make predictions about games (Dixit, Skeath and Reiley 2015: 263). Thirdly, evidence from experimental studies suggest that players, rather than being fully rational, make complex decisions based on suboptimal, simplistic rules. This is as players are mutually interdependent in these situations. This means that the welfare of one player is determined by the actions of other players in the game, at least to some extent, and

this leads players to act strategically rather than purely basing their moves on instrumental rationality (Romp 1997: 2-4; Sen 1977).

Elster divides the theories surrounding rational behavior into two different strands, the instrumental and the substantive. The first may be said to encompass Harsanyi's three theories. This instrumental theory deems a move to be rational if it complies with the player's beliefs and desires, and as a combination these may be referred to as the player's reasons. The most important concept in this theory is consistency. A rational actor has consistent preferences and beliefs, and act on these accordingly. This concept excludes the possibility for weakness of will and contradictions in a player's behavior (Hovi and Rasch 1993: 23-24). However, players in game theoretical scenarios can move away from their self-interested nature to behave reciprocally. Reciprocity entails that players, in response to friendly moves from their opponent, act more cooperatively than envisioned by traditional, self-interest predictions. Contrastingly, when faced with uncooperative behavior by their opponent, players often respond by being more brutal (Fehr and Gächter 2000: 159-160). Such behavior may not even be motivated by potential future payoffs in repeated games, sometimes referred to as the "shadow of the future" (Bó and Fréchette 2018: 109). In the case of reciprocity, players may respond to cooperative or uncooperative behavior irrespective of whether behaving cooperatively now means the future will hold potential payoffs. The same goes for altruism, as altruism received does not equal altruism given, but rather is a response based on unconditional kindness (Fehr and Gächter 2000: 160).

A conditional strategy is therefore one in which a player decides what to do based on the actions of other players in the game. This allows a player to use a punishment strategy with another player if his or her actions deviate from the desired, or Pareto-efficient, outcome. If an equilibrium is Pareto-efficient, no individual player in the game can be made better off without making someone else worse off (Romp 1997: 4). Thus, if the threat of punishment is sufficiently severe and appears credible, players will be deterred from deviating (Dixit, Skeath, and Reiley 2015: 36). For instance, the trigger strategy entails that a player will play cooperatively as long as his or her opponent does so, but any defection will trigger a period of punishment, in which the player will not cooperate. This strategy is also known as tit-for-tat, since it entails that a player will cooperate with his or her opponent as long as they do. A harsher version of this strategy is known as the grim strategy, whereby a player, if faced with

defection from his or her opponent once, will defect in every consecutive round for the entirety of the game (ibid, 381; Jervis 1988: 339).

In this sense, relations between states may produce either enormous trust or enormous distrust. Thankfully, the continuity of relationships could help to generate behavior that would otherwise be viewed as foolish or even purely altruistic (Granovetter 1985: 492). This is as reputation matters to countries. An international negotiation, for instance, is never conducted in a vacuum, or a so-called self-contained game, but rather is part of an infinite supergame (Bó and Fréchette 2018). While each part of the negotiation has its own, distinct payoffs, the tactics employed will affect the strategy of the other player in later stages and thus affect future payoffs. A player's strategy is therefore a complete plan of action that specifies how a player should act in response to all the various situations that might confront them during the course of playing a game. Generally, supergames only end in the event of exceptional circumstances, for instance if a government ceases to exist or if a government expects no continuity in the current bilateral relationship and may therefore consider the losing circumstances to end the supergame (Iklé 1964: 77).

As a result, political relationships tend to persist over time. States therefore expect to negotiate with one another for the foreseeable future, and not just presently. This anticipation may serve to alter the strategic logic of games. Players need not only consider immediate consequences of their moves, but rather the effect these moves will have in future stages of the relationship. Therefore, the benefits incurred in the future may outweigh the immediate payoffs associated with defecting. Likewise, a state may threaten to end the bilateral relationship in order to secure short-term exploitation of the other state (Morrow 1994: 260). In this respect, it is important to keep in mind that a promise or a threat to do something is credible if, and only if, it is in the interest of the player who makes the promise or threat to actually carry it out when called upon to do so. Thus, given that players are rational, and given also that both the rationality of the players and the structure of the game are common knowledge, it is reasonable to infer that players will not believe threats or promises that are not credible (Baldwin 1971: 150; Ordeshook 1986: 443).

2.2 Nash equilibrium

Perhaps the most important concept in game theory is that of Nash equilibrium (Kalai and Lehrer 1993a: 1019). This concept is still viewed as the most influential way of going from mere descriptions of situations to predicting the moves of players (Ordeshook 1986: 118). However, there is still no common understanding among game theorists when it comes to Nash equilibria fine-tuning. Nash equilibria rather assume that a player has a common understanding of which strategies the other player may play. Thus, at a Nash equilibrium point, each individual player has maximised his own benefit provided that all other players' strategies have been given (Binmore 2007; Hermansson 1990: 107). As such, no player can get a better payoff by switching to some other strategy that is available to them while all the other players adhere to the strategies specified to them. This understanding ensures that players know that these strategies are best replies. An alternative to this is rational learning by way of repeated games. In such circumstances, players start with hypotheses about which strategies the other player may employ. The other player then responds with their best replies and given this gradual understanding, players update their strategy as they observe the actions of other players in the game. In this way, the players learn to play the game, one move at a time (Morrow 1994: 305-306).

It has been demonstrated by Fudenberg and Levine (1993) and Kalai and Lehrer (1993) that repeated games lead to rational learning. This line of reasoning entails that players will eventually end up playing a Nash equilibrium. However, the process by which players learn to play Nash equilibrium, is not fully understood. For instance, if a game is played only once and players have no prior experience to guide them, it should come as no surprise to observers that learning is limited to any theories the players may have about previous models of how to best play the game. Similarly, if the game does not have enough rounds of play, players may have a great deal of information about the strategies they have chosen to play, but players may not have much incentive to invest in exploring many strategies. Consequently, play may fail to be Nash because untested beliefs about the play of other players off the equilibrium path are not correct (Fudenberg and Levine 1993b: 563). In repeated games, on the other hand, where players have more time to observe the strategies of other players, the hope is that statistical learning theory will eventually lead players to the equilibrium path of play (Kalai and Lehrer 1993a: 1019).

The notion of a self-confirming equilibrium was initially introduced by Fudenberg and Levine (1993b) for finite extensive form games, but can also be extended to infinite games. A player in such a game chooses a strategy to maximise his expected payoff given his beliefs about the strategies of other players (Kalai and Lehrer 1993b: 1231-1232). In a self-confirming equilibrium, each player's strategy is a best response to his beliefs about the play of his opponents, and each player's beliefs are correct along the equilibrium path of play. Therefore, if a self-confirming equilibrium happens several times, no player ever observes play that contradicts his beliefs. The concept of self-confirming equilibrium is driven by the idea that non-cooperative equilibria should be viewed as part of a learning process, whereby players revise their strategies in light of information obtained in previous rounds of play (Fudenberg and Levine 1993a: 523).

To complicate matters further, repeated games tend to open up for the possibility of multiple equilibria. In order to avoid not choosing a Pareto-dominated equilibrium, players my select a focal point in the wide array of equilibria. Focal points may be set by assigning different payoffs or creating societal differences between strategies or outcomes that are not directly specified in the game. In this way, common experience or convention may also serve to create focal points (Morrow 1994: 305-306). However, using focal points to solve games with multiple equilibria is not as straightforward as it may sound. Experimental evidence demonstrates that such refinements often are unable to predict real-life behavior in repeated games (Morton 1999: 193).

2.3 The inability to monitor

Another common issue in the game theory literature is the inability to monitor, which is related to the problem of multiple equilibria. In repeated play, a prediction is made regarding which equilibrium will be selected. In this respect, it is important to keep in mind that the value of future reputation always trumps the advantage gained by defecting in the short term. Thus, it is crucial that the state believes that its present behavior will affect its reputation in the future (Kreps 1990: 529-533). Clearly, it is more tempting to break the rules of an agreement if this is likely not to be noticed by the other state and there will be no repercussions, particularly if the length of the game is unspecified or unknown. This has been

mentioned in relation to arms control (Brams 1985) and signifies the importance of being able to monitor the other player's behavior, even after an agreement has been ratified. The importance of this can also be applied to the agreements underpinning Norwegian-Russian petroleum relations in the High North, as actually adhering to the agreements signed is more important than the process involved in settling disputes. It is, however, not always possible to monitor the other state after an agreement has been signed and put into force (Hovi and Rasch 1993: 82-86).

2.4 Utility functions

Game theory is also based on the assumption that the two players in the game know each other's utility functions. This means that they are aware of one another's preferences and attitudes towards risk. Given this, the theory lays out optimal strategies for both players, and also predicts the outcome of bargaining between these two rational players (Shubik 1973). Nash (1950) provides the original definition of the bargaining game and solves it by demonstrating that particular assumptions lead players of the game to pick a certain agreement (Axelrod 1967: 89). Within bargaining situations, then, the behavior of a rational player would depend on his expectations regarding the other player. However, if players did actually know one another's utility functions, there would be no need for traditional bargaining. This is as the players would not need to try out one another's utility functions by presenting successive bids and counterbids. Instead, the players could simply state their final terms independently and compare one another's bids. If they were compatible, each player would get what they wanted. Even if players did not know one another's utility functions, but bluffing was rampant, bargaining would not lead to any useful information being obtained by the players (ibid; Pen 1952). Thankfully, in the real world, there is scope for true bargaining as states do not know one another's utility functions and there are reasons to avoid unnecessary bluffing (Harsanyi 1962a: 29-37).

2.5 Repeated games

The Prisoner's Dilemma (PD) game can help explain how states interact with each other

under tacit circumstances when the game is repeated. This game has two players. Each player has two choices, either to cooperate or to defect. Each player has to make their move without knowing what the other player will do. Regardless of what the other player does, defection always yields a higher payoff than cooperation. The dilemma, however, is that if both players choose to defect, both will end up worse off than if both had cooperated. The game is played out as follows: One player chooses a row, and then chooses either to cooperate or defect. Simultaneously, the other player chooses a column, either cooperating or defecting. If both players choose to cooperate, both get payoff R, the reward for mutual cooperation. If one player chooses to cooperate, but the other defects, the defecting player gets payoff T, while the cooperating player gets payoff S, the sucker's payoff. If both defect, both get payoff P, the punishment for mutual defection. These properties mean that it is better to defect if you think the other player will cooperate, and it is better to defect if you think the other player will defect. So, no matter what the other player does, it pays for you to defect. The same logic holds for the other player. In this way, individual rationality leads to a worse outcome for both than what is possible, and that is the nature of the dilemma (Axelrod 2006: 7-9). Figure 1 below illustrates a typical Prisoner's Dilemma game and its associated payoffs.

	Cooperate	Defect
Cooperate	R = 3, R= 3 Reward for mutual cooperation	S = 0, T = 5 Sucker's payoff, and temptation to defect
Defect	T = 5, S = 0 Temptation to defect and sucker's payoff	P = 1, P = 1 Punishment for mutual defection

Figure 1. The Prisoner's Dilemma Game (ibid, 9).

The main features of the game illustrated above can be summarised into three distinct properties. The first is that each player has a dominant strategy. The second is that if each player follows their dominant strategy, the outcome of the game will be Pareto-inferior,

because both players can find some other outcome that they unanimously prefer. Third, and finally, the strategies are dominant because they imply that even if the players can communicate before the game began, this will not serve to avoid the Pareto-inferior outcome. Unless the players can make an effective and binding agreement before the game starts, each player will ultimately defect from the Pareto-optimal outcome (Ordeshook 1986: 207).

Even if issues of international politics, according to realism, must remain a PD, this game can sometimes be altered so that it is more benign in nature. This can be done by changing the payoffs to encourage cooperation, for example by increasing the transparency that allows each state to view what the other state is doing and understand why it is doing it. The knowledge that even if the other state in the game is benign today, it may become hostile in the future due to a change in circumstances, may equally force state officials to create arrangements that bind themselves and their partners. Realism, however, cannot explain why deeper forms of cooperation, that are more problematic from this perspective, exist between states (Jervis 1998: 987).

Game theorists often model repeated versions of the PD game to learn how to represent cooperative agreements as Nash equilibria. However, a cooperative outcome cannot be secured merely by making sure that a game is played repeatedly. Imagine a PD game that is played several times by the same two players and where both players know starting out the number of rounds of play the game will have. If behaving rationally, a player should cooperate early on in the game, in the hope that the other player will cooperate in future rounds. Notice in a PD game that there is no reason to cooperate in the last round, as cooperation cannot yield any future payoffs. In the last round, then, each player should employ their dominant strategy, which is to defect. However, this reasoning also means that cooperating in the second-to-last round is meaningless because both players know that this will not yield cooperation in the last round of the game. The conclusion reached from this line of reasoning is that both players should defect in the very first round of the game, and in every round following, until the game inevitably ends (Ordeshook 1986: 443-444).

While this example demonstrates that merely repeating a game does not yield cooperation between the players, many dilemmas found within the realm of politics differ from this scenario. In real life, players often do not know when a game will end or, indeed, if it will ever end. State officials, for instance, would like to believe that the timeline of their country is

infinite. In order to model such situations, an extensive form representation of the game with infinite repetitions is needed. Analysing such extensive form games by way of backwards induction and subgame perfection, however, is impossible because the end point of the game is either unknown or non-existent. In the case of an infinitely repeated game, then, some simplifying assumptions about the available strategies in the game must be laid out. In such a game, there are always more strategies available than can be described as there will be an infinite number of rounds with an infinite number of conditional responses. In the defence of game theorists, nevertheless, it seems fair to say that players in such games simplify their decisions and adopt certain heuristics as strategies when confronted with such complex circumstances (ibid; Hovi 1998: 93). Keeping this in mind, a subgame is the part of an extensive form game that remains to be played beginning from any node at which the entire history of the game up to that point is common knowledge in that both players know that the subgame begins at that node in the game. The notion of subgame perfection is thus a refinement of the Nash equilibrium because, in order to count as a subgame perfect Nash equilibrium, a set of strategies must be both a Nash equilibrium and not involve non-credible promises or threats (Grieco 1988).

Non-cooperative game theory employs two different types of representation to understand situations. These include the extensive form and the normal form. The extensive form contains information on whose move it is at any particular point in time, which alternative actions are available to each person at any particular move, what each player knows about the other player's preceding moves, and what each player's utilities over outcomes are. Thus, the extensive form consists of a game tree that has several features highlighting the relationship between moves and their outcomes:

1. The game tree has a finite set of nodes. Some of these are terminal nodes, which indicate outcomes of the game. The remaining nodes represent choice nodes, which are points of choice by a designated player in the game.
2. From each such node there is a branch assigned to each move that a player can choose at that point in the game.
3. The tree indicates the sequences of choices. Therefore, its base consists of a single choice node, which represents the game's first move, or starting point. Each of the branches from the starting point connects to the next point in the game if a player chooses that option as the first move. If this point is an end node, however, the game ends. If it is not, this is the next choice node in the game, and so on.

4. The information sets in the game tree showcase the uncertainty of the player who will move next about the preceding choices that the other player in the game has made. If the information set contains only one choice node, then the player who makes a move at this point knows the location of the choice in the tree, but if the information set contains more than one node, then the player knows that the game has reached one of the nodes in this information set, but is not aware of which one it is.

The remaining conditions deal more with the players themselves than with the rules of the game, as the extensive form summarises them. The extensive form includes the utility functions of the players and these are outlined in terms of the tree's end points. Additionally, each player knows, and expects the other player to know, all the information available about the situation that the game tree presents, any player knows that the other player knows that he or she knows the tree, and so on. In the language of game theory, therefore, the game tree can be said to be common knowledge (Ordeshook 1986: 99-102). Figure 2 below is an example of how an extensive form Prisoner's Dilemma game, like the one drawn out above, may be illustrated.

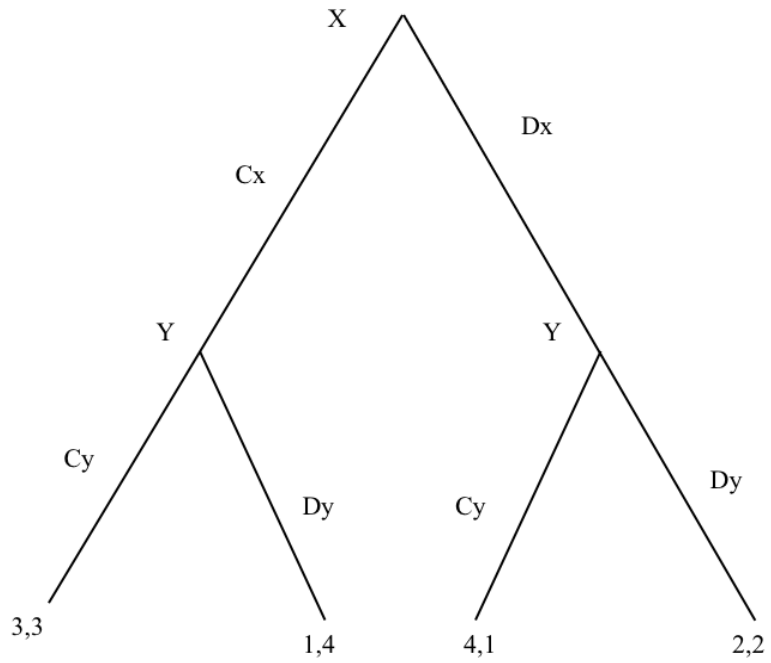

Figure 2. Extensive Form Representation of a Prisoner's Dilemma Game (Gates and Humes 1997: 99).

The extensive form of any game, like the Prisoner's Dilemma game above, can represent specific details about a given set of circumstances. Even relatively simple games, such as tic-tac-toe or poker, may nonetheless be too complex to be described at length. Therefore, it may be necessary to forsake insignificant details and rather focus solely on the more general features of the game. Another solution would be to focus attention on just one part of the game tree. For instance, developing a game tree for only the next five moves of a specific game would simplify the analysis. Understandably, every extensive form game must be incomplete, because the only fully complete form of the game models the entire future. Nonetheless, the extensive form of a game can help highlight the basic principles of game theory and set the stage for analysing any unique game (Ordeshook 1986: 103).

Finally, it is worth defending the use of game theory in this thesis. The basic orientation of game theoretic modelling is toward the development of general explanations. Even so, many applications of game theory in the political science literature have simply attempted to figure out whether events like the Cuban Missile Crisis, perhaps the most dangerous confrontation between the United States and the Soviet Union (SU) ever (Brams 1985: 48-51), was really a case of the Chicken or the Prisoner's Dilemma game. Such an approach may adapt an already established game theoretical model to fit a particular situation, but does not help generate new predictions about similar situations (Gates and Humes 1997: 7).

However, like other social science models, game theoretic models do not try to address all complexities inherent in social interactions. The value of these models is rather derived from their ability to develop elegant explanations for complex issues. This means that only the relevant players and moves are evaluated, but additional assumptions may be evaluated as the sophistication of the model increases (ibid, 8). In this way, it is worth employing a game theoretic analysis to the study of Norwegian-Russian petroleum relations in the High North to simplify the analysis by only looking at these two states and limiting the selection of variables to the two hypotheses outlined in the previous chapter. The next chapter will provide some background regarding the circumstances surrounding Norwegian-Russian cooperative petroleum relations in the High North, and thereby help position these two states in the wider regional and international context.

3 Background

This chapter provides an overview of the circumstances surrounding the cooperative relationship between Norway and Russia in the High North, with an emphasis on petroleum relations. This chapter is divided into seven key headings, which highlight significant issues or features of the literature on this topic. These headings include 'Definition of the High North', 'The harsh climate of the High North', 'The importance of access to petroleum resources', 'Potential petroleum reserves in the High North', 'The issue of climate change', 'Russia's High North strategy' and 'Russia's relationship with the West'.

3.1 Definition of the High North

There are several ways in which the Arctic, or the High North as it will be referred to throughout this thesis, can be defined. The most common way of defining the region is by including everything above 66° and 32 minutes north of the polar circle. This line of latitude denotes northern and southern zones of the Earth where, for at least one day per year, the sun neither sets nor rises. This definition has been favoured because of its definitional precision and as it is politically more inclusive, adding three more Arctic states to the equation, making for an 'Arctic 8'. This definition includes the eight states that have territory above the Arctic Circle, and therefore includes Iceland, Finland and Sweden. Contrastingly, the five Arctic littoral states are the states that have Arctic coastlines and can claim exclusive rights to resources within their respective 200-mile Exclusive Economic Zones (EEZs), and these are Canada, the United States, Denmark, Norway and Russia (Ermida 2015: 170; Tamnes and Offerdal 2014: 99-100). A limitation of this definition, however, is that it has little climatological meaning, which is often the defining characteristic of how the Arctic region is perceived around the world (Hough 2013: 4; Mazo 2015).

Unfortunately, no precise definition of the High North is conveyed within Norwegian politics. It is clear, however, that the region is broader than Northern Norway and Svalbard as Norway has interests to safeguard further north and further south than this. The definition may therefore encompass areas as far south as 62° latitude. In 2006, when the government's High North Strategy was developed, the High North denoted areas surrounding the Barents Sea. In

this regard, particularly with a view to secure closer international cooperation, the High North is gradually becoming more synonymous with the word Arctic, which is used more frequently and more consistently internationally (Hønneland and Rowe 2010b; Schönfeldt 2017: 154). The words High North and Arctic will, as a result, be used interchangeably throughout this thesis to describe the region in question.

3.2 The harsh climate of the High North

Historically, the harsh climate of the High North has limited its visitors to experts. This is because it is a region that is difficult to access. While sea ice hinders shipping during the winter, the thawed permafrost makes transport on land difficult in summer. Nevertheless, Norway has always had strong interests in this icy area. In fact, one third of mainland Norway lies north of the Arctic Circle, and Norwegian jurisdiction in the Barents Sea and the Arctic covers an area six times greater than the size of mainland Norway (Orheim 2006: 26).

Though there are several interested parties undertaking projects in the High North, the pace of developments is likely to be slower than forecasts suggest. This primarily comes down to two factors. The first of these is the difficult operating conditions and climate in this region. The second factor is the availability of other development opportunities in more readily accessible areas. While forecasts suggest that the region's sea ice cover may become thinner and allow for navigable waters for longer periods than has been the case previously, this is not an absolute certainty. Even so, the amount of ice predicted in the future will still serve to trouble operations in the area. This is problematic, given the added costs to platforms, ships and pipelines used for exploration, extraction, and transportation of oil and gas. These operations, therefore, have to be built to a more robust standard than is the case in other parts of the world, to reduce damage from the ice (Johnston 2012: 17).

3.3 The importance of access to petroleum resources

Petroleum has since the mid-1950s been the most important source of energy worldwide. And, according to experts, world energy supply will still be heavily based on petroleum resources in 2030. Even then, only 10% of world energy supplies will consist of renewable

energy sources according to forecasts from the International Energy Agency (IEA). Thus, it would not be wrong to claim that the world is still driven by petroleum, and will be for years to come (Rottem, Jensen and Hønneland 2008: 64). As a result, secure and stable access to petroleum is a key geopolitical element in today's world. Many of the world's major sources of traditional fossil fuel or crude oil reserves are presently found in volatile regions and finding secure reserves elsewhere is therefore high on the agenda (Gottemoeller and Tamnes 2009: 41). The idea that the Barents Sea may become an important petroleum province is believed by many, but more research is certainly needed before it will be known what petroleum resources can be found on either side of the Norwegian-Russian border. In 2007, nonetheless, the Norwegian Petroleum Directorate (NPD) estimated that as much as 30% of all potential undiscovered Norwegian oil and gas could reside in the Barents Sea. Before these resources may be extracted, however, the rights of states to access and use these petroleum resources need to be resolved (Jensen and Rottem 2009: 78; Hønneland and Rowe 2010b: 118; Rottem, Jensen and Hønneland 2008: 70).

Energy security is crucial for both net energy suppliers and importers. While the former attempts to balance short-term profit with the need for security of demand from satisfied partners, the latter seeks secure supplies at manageable prices, preferably without political strings attached. Among the Arctic states, Norway and Russia are well-established petroleum exporters. The potential for exploiting Arctic petroleum resources gives these two states possible insurance against the exhaustion of existing petroleum reserves and may provide Russia with a new and easier solution for exporting oil and gas to Asia. From a longer-term perspective, exploring and extracting petroleum reserves in this region might also offer extra capacity for the increasing energy needs of growing economies and help to relieve the current Western and Asian reliance on reserves from the politically unstable Middle East (Jakobsen and Melvin 2016: 26-28; Kratochvil and Tichy 2013).

In light of the above, the world clearly needs energy. The IEA envisages that energy demand will increase by roughly 45% in the years leading up to 2030. Furthermore, the production of oil and gas will increasingly take place in a limited number of countries, most notably from the Organisation of Petroleum Exporting Countries (OPEC) (Sørenes 2009: 16). In this regard, the petroleum sector is significant for Norway, particularly for its export sector. It is crucial for Norway to remain a reliable petroleum exporter to decrease the relative energy monopoly of OPEC states. As of today, a large amount of Norway's petroleum reserves have

already been exploited and extracted, but the state's Arctic and Barents Sea waters have high estimates of undiscovered resources. Moreover, while the petroleum sector is significant, the Arctic also has a strong strategic and identity significance for Norwegians and Norway more generally (Keil 2014: 176; Maugeri 2003).

It is worth mentioning that, as Norway is a mouse compared to the Russian bear, it is necessary for Norway to cooperate with other states in securing its interests in the Arctic. Presently, many states that are strategically vulnerable to a loss of Norwegian energy production, such as Germany and the UK, share a clear interest in the shaping of Norwegian foreign and petroleum policy, and are generally happy to help secure the Arctic region (Austvik 2007: 22). There is currently some Norwegian petroleum activity in the area commonly referred to as the High North. As per May 2017, there are 71 production licenses in the Barents Sea. The first were awarded in 1980, and the first well was drilled in the same year. From 1980 until 2016, 49 discoveries were made. The first, Askeladd, part of the current Snøhvit field, was made in 1981. The most northerly well, Atlantis, was drilled in 2014 and resulted in a small gas discovery. Today, only two fields are under production in the Barents Sea, namely Snøhvit and Goliat (The Norwegian Petroleum Directorate 2017: 7). These two fields can be seen in figure 10, which illustrates the process of the Delimitation Agreement and petroleum discoveries in the Barents Sea.

While Norway, on the whole, should be considered a small power on the international scene, Norway is up there with the great powers within the realm of petroleum. This is particularly true in terms of technological innovation and expertise. It is therefore no secret that Norway hopes to supply Russia with its technology to secure cooperation between these two states' economies and petroleum companies, particularly in the High North. Additionally, domestic pressures and the need for urgent access to petroleum resources could affect the willingness to negotiate agreements and push both states to cooperate. Regardless, economic and technological interdependence between the relevant states in this region serve to raise the conflict threshold (Jensen and Rottem 2010: 78-9). This argument provides leverage for the second hypothesis stating that Norwegian-Russian petroleum relations in the High North have remained cooperative because both states can benefit from the others' petroleum resources and expertise. While Russia hopes to rely on Norwegian technology in order to exploit its petroleum reserves in the High North, Norway hopes to benefit from these reserves as a thank you for facilitating their extraction.

3.4 Potential petroleum reserves in the High North

It has been estimated that a large share of the world's remaining recoverable petroleum resources are located in the High North, but it is still unclear how large this share of resources is (NMFA 2009: 23). Covering only 6% of the Earth's surface, the Arctic potentially holds as much as 22% of the world's undiscovered oil and gas reserves (Budzik 2009). The United States Geological Survey (USGS), published in 2008, provided an assessment of undiscovered oil and gas resources in the High North, also known as the Circum-Arctic Resource Appraisal (CARA) (Baev 2017). However, without exploratory drilling, oil and gas resources cannot be proved to exist anywhere. Unfortunately, the USGS is not based on data from such exploratory drilling. It is rather an estimation of the probability of presence of oil and gas reserves in 33 provinces north of the Arctic Circle. Eight of these provinces were found to have less than a 10% probability of having at least one significant petroleum reserve. The remaining provinces were estimated to potentially hold 90 billion barrels worth of oil, 44 billion barrels of natural gas liquids, as well as 1,669 trillion cubic feet of natural gas. This estimate covers both onshore and offshore provinces. The USGS is widely cited as a legitimate starting point in academic and political discussions concerning Arctic petroleum exploration, without considering its potential limitations and this is problematic. As an example, the USGS estimates are based on general seismic surveys of the region, far from the industrial seismic surveys undertaken in specific areas before exploratory drilling takes place (Baev 2017; Tamnes and Offerdal 2016: 100-1).

Nevertheless, the USGS is the best assessment we have of potential petroleum reserves in the High North to date. According to this assessment, Russia has the largest estimated oil and gas potential in the Arctic, making for 52% of the total, equivalent to 216 billion barrels of oil (Borgerson 2008: 67-68; Keil 2014: 168). Norway has the third biggest potential for Arctic oil and gas resources in its areas of jurisdiction, lagging behind Russia and the USA. Just like Russia, Norway is highly dependent on its petroleum industry, which totalled 21% of its gross domestic product (GDP) in 2010. It is also hard to ignore the fact that petroleum is Norway's largest industry, whether measured in revenue, value creation or export value to the Norwegian state. The potential of the High North as a future petroleum province is even more interesting given that the NPD estimates that around 43% of Norwegian petroleum resources have already been extracted (NMPE 2010; 2011: 28; 2017). Therefore, to make up for depleting reserves, Norway is heavily invested in mapping out potential petroleum provinces

and granting exploration licenses, which amounted to 51 new blocks in the Barents Sea in 2011 (NMPE). Luckily for Norway, High North waters under Norwegian jurisdiction are expected to bear fruit in the future (Keil 2014: 175-6). It is also estimated that petroleum reserves in the Russian Arctic could equal up to 113 billion tons (Nordquist, Moore and Skaridov 2005: 94).

The prospects for significant petroleum deposits in the High North are, without a doubt, a factor which has had an impact on Russian and Norwegian attitudes and their willingness to make concessions in their boundary negotiations concerning the region. This is as the settled boundary determines the extent of the petroleum reserves allotted to each country. As Norway and Russia have not been able to agree on any joint utilisation of the area, the current knowledge of the resource potential here is quite poor. Seismology collected from both states has nevertheless indicated significantly large gas potential in the southern part. This declared knowledge of large deposits therefore makes it difficult to allow for concessions (Kvalvik 2004: 60). To illustrate, figures 3 and 4 below clarify the regional distribution of undiscovered Arctic oil and natural gas resources respectively.

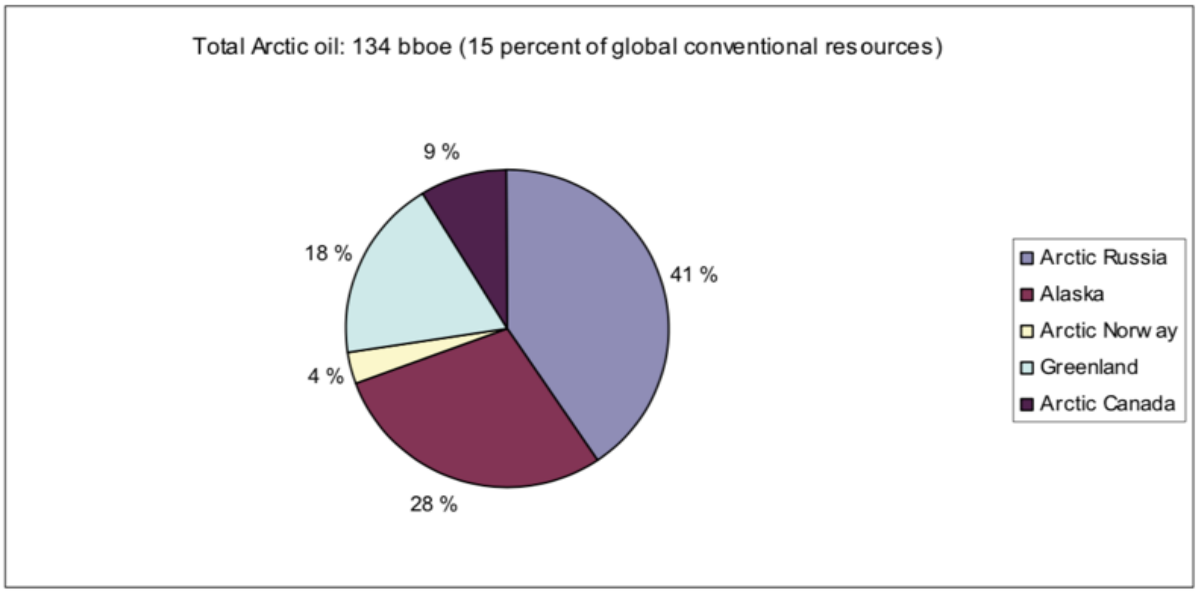

Figure 3. Regional Distribution of Arctic Undiscovered Oil Resources (Lindholdt and Glomsrød 2011: 8).

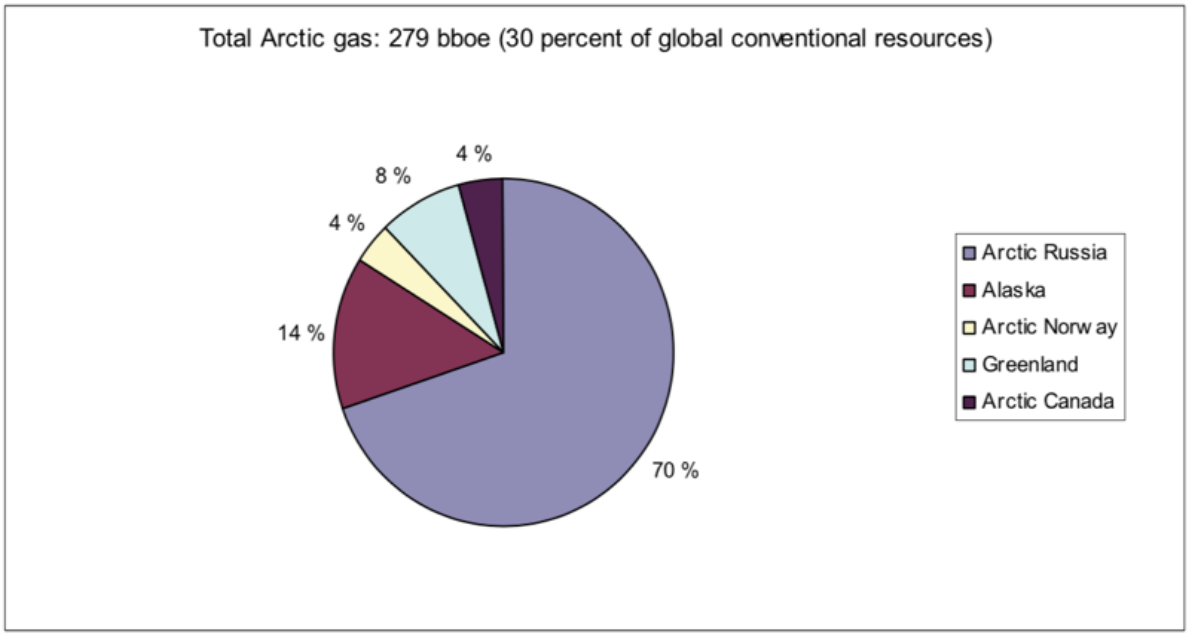

Figure 4. Regional Distribution of Arctic Undiscovered Natural Gas Resources (ibid).

3.5 The issue of climate change

The 'Arctic Climate Impact Assessment' was recently compiled by over 200 scientists. It concludes that "the Arctic is likely to experience more rapid and severe climate change than any other region on Earth" (Orheim 2006: 36). In fact, the Arctic region is predicted to warm at twice the rate of the global average, which will dramatically alter access to this region. Paradoxically, however, more is currently known about the surface of the planet Mars than what is known about the depths of the Arctic Ocean, but it does have the possibility to hold relatively large undiscovered petroleum reserves (Borgerson 2008: 67).

With the prospect of only a small part of the Arctic Ocean having sea ice cover by the second half of this century, new shipping routes are to be expected (Anderson 2009). This is a particularly viable alternative given that the distance to Rotterdam over the Arctic Ocean is half the distance through the Suez Canal, making the Arctic Ocean the main gateway between North America, Europe and Asia during the summer months. Furthermore, when contemplating petroleum activities, it is widely regarded that the largest environmental hazard stems from transport of oil in tankers, and not exploration or exploitation. By all means, the climate is adversely impacted by the burning and use of fossil fuels, but this is a general

problem which will not be solved by simply stopping petroleum exploration and extraction in a particular area (Orheim 2006: 36).

Looking at Arctic geopolitics through the lens of neorealist interpretations of climate change and increasing competition for resources, two distinct narratives appear. The first deals with Arctic space as open and indeterminate in nature. This perceived openness of the Arctic enables it to become a space for conflict and conquest, mirrored by accounts of a so-called race to, or scramble for, the Arctic more commonly advocated during the first decade of the 2000s (Moe, Fjærtoft and Øverland 2011: 158; Rottem 2010). However, this narrative also nourishes the idea of Arctic space becoming an arena for state-building and international relations, an argument more commonly put forward today (Dittmer et al. 2011: 202).

Paradoxically, two of today's main energy trends are toward an increase in unconventional petroleum production, and also toward a stricter global climate policy. The former helps to prolong the dominance of petroleum resources, while the other hopes to cut greenhouse gas emissions globally as quickly as possible. The current global energy market and legislation is thus rife with tensions, making the future unpredictable (Øverland 2015). As an example, the Paris Agreement can be viewed as a global economic trend that will eventually generate risks and hardship for Russia's economy. A failure to realise the urgent need for action concerning climate change, might send Russia into a deep crisis because a global decrease in oil demand could slash Russian revenues while the costs necessitated by extreme weather could increase significantly (Kokorin and Korppoo 2017: 12). To illustrate the Russian difficulty in dealing with these environmental changes, an opinion poll conducted in July 2017 indicated that 70% of Russian citizens associate severe weather alterations with climate change, but only 55% acknowledge the anthropogenic origins of climate change. Furthermore, 35% of the public attributed changes to natural variations (ibid, 2).

3.6 Russia's High North strategy

The uncertainty surrounding Russia's domestic, foreign, and security policies, and their impact on the Arctic, is a recurring theme in circumpolar studies. This is even more of a critical question when considering Russian sanctions, the annexation of Crimea and the situation in Ukraine (Zysk and Titley 2015: 176). So, what is actually Russia's formal policy

in relation to its petroleum resources in the High North? It is important to remember, first and foremost, that Russian Arctic policy is a coherent part of overall Russian foreign policy, and will therefore include similar, if not identical interests (Piskunova 2010: 852). The main official Russian strategy document on the Arctic, "Principals of state policy of the Russian Federation in the Arctic to 2020 and beyond", may answer this question (Staun 2017: 319).

One of the main aims of this strategy is economic development and a transformation of the High North into Russia's greatest strategic base for natural resources by 2020 (Zysk and Titley 2015: 170). What first strikes the reader is how similar this document's language is to Western policy documents concerning the Arctic. Natural resources are introduced as early as in paragraph 4.a as Russian "national interests". In the following paragraph, 4.b, the second national interest is listed as "the preservation of the Arctic as a zone of peace and cooperation" (Øverland 2010: 867). Other Russian interests include the protection of ecological systems and the promotion of the northern sea route as an international waterway (paragraphs 4.c and 4.d respectively). In this respect, Russia's main Arctic policy paper clearly emphasizes the need for international cooperation and other politically correct objectives, as it later mentions setting up a regional system of search and rescue as well as improving the lives of indigenous populations (paragraphs 7.b and 7.h respectively). Interestingly, the document also highlights the need to remove anthropogenic pollution from the Arctic (paragraph 8.e). Thus, many of the same concerns for soft values, cooperation, and the environment, like in Western Arctic policy documents, are expressed and given high priority in this Russian High North strategy. Although this document does include references to military security, these are by no means dominant. Rather, these references represent a small part of the various policy proposals highlighted in the paper (ibid, 866-868).

On the 2nd of August 2007, Russia planted a titanium flag on the Arctic seabed at the point assumed to be the location of the North pole. This act was interpreted by international media as an effective public relations gesture for two reasons. Firstly, this scientific and technological exploit, which entailed descending 4200 metres beneath the ice cap demonstrated Russia's significance in the scientific world. Secondly, by performing this act, Russia reminded the world that it is still a great power that intends to defend its claims in the Arctic and to have those rights recognised internationally (Bartenstein 2009: 187; Dittmer et al. 2011). Though the reasoning behind this so-called stunt is still not entirely known, what is clear, however, is that Russia cannot be ignored in the High North and must be considered

whenever thinking about policy in this region. While Russia's influence has definitely been reduced compared to the time of the SU, its status as the largest Arctic state still means that it is highly influential in the region (Rowe 2014: 76). Russia has the greatest landmass, population and resources in this area as well as substantial and growing military forces. Although Russia has attempted to keep its own foreign policy and regional issues out of the equation, the perception of Russia as a reliable partner has unquestionably been undermined. Russia's tendency to put its respect for international law and cooperation aside when its national interests are at stake, could have a potentially catastrophic impact on Arctic relations. This is especially worrying given how heavily dependent Arctic affairs are on the respect for international law (Zysk and Titley 2015: 178). However, it would be wrong to judge Russia's behavior in the Arctic solely upon its record of disagreement with the West in other areas. On the contrary, Russia has continuously proved its commitment to international law in the High North by demonstrating that it is a committed, rule-abiding actor here (Roberts 2015: 116).

3.7 Russia's relationship with the West

Since the fall of the Soviet Union, the relationship between Russia and the West has been viewed as a dichotomy of cooperation and conflict. The disintegration of the SU was not only one of the most significant events of the last century, but it was also accompanied by a reversal of the ancient Russian tradition of gathering territory and the state was left without an ideology and with an economy in turmoil (Sakwa 1996: 374). While Russia and the EU have often emphasised that they share the same values and interests, these players have also pursued their own interests alone, sometimes resulting in conflict. The petroleum sector and the economic sector are most often associated with cooperation between these two players, as EU member states and Russia have been able to strike mutually beneficial agreements within these issue areas (Hønneland 2013: 79-80).

The onset of the Ukraine crisis, however, caused relations between Russia and the EU to freeze. Russia was left feeling alienated by the way the West had handled the end of the Cold War, for instance labelling it a victory. The Kremlin hoped that the collapse of the SU would help the West bring about a pluralistic world order, such as that envisioned in Gorbachev's 'European home' project, with the help of Russia (ibid). Instead, according to Russia, the 1990s and 2000s saw the EU work towards expansion. In response, Russia attempted to

counter this EU-centric focus on its values, rules and regulations by establishing initiatives such as the Collective Security Treaty Organization and the Eurasian Economic Union. While being mostly reactive, these initiatives and others served to counter the EU's worldview and expansion into former Soviet territory (Nitoiu 2017: 148-150).

Historically speaking, the Russian international position has emerged as largely dependent on the power and recognition of the West. The process of defining Russian national identity post-SU has yet to come to an end due to the lack of long-term visions and strategies. Russian foreign policy has therefore been reactive in nature, in that it responds to the policies of the West rather than setting its own foreign policy agenda. On the one hand, Russia wants to be a great power able to survive in an unfriendly, realist world. On the other hand, this great power objective reflects Russia's self-perception and its history of being the great power that was the Russian empire or the Soviet superpower. This dualism, the desire to strengthen power capabilities vis-à-vis the West while seeking its help and recognition, create preconditions for cooperation with the West as well as potential for non-cooperation and even conflict (Kropatcheva 2012: 31).

In its foreign policy concepts Russia proclaims cooperation, but also uses warnings to the West to try to influence its actions. Throughout the 1990s, Russia sought inclusion and acceptance of Western countries. During this time, the West missed a unique opportunity to engage Russia more in political and economic Western institutions and to contribute to the creation of a new multilateral order. Instead, the West chose to interfere in the internal affairs of Russia while it was in a deep internal crisis and rushed to make use of its foreign policy and military weaknesses to claim as many advantages as possible before Russia eventually started to reassert its national interests. These circumstantial changes were overlooked in the West, and only after a military conflict in Georgia did the West understand that Moscow was serious and ready to fight back (ibid, 31-35).

Before the Ukraine crisis, the EU was convinced that its integration project was purely economic in nature and did not a have geopolitical component intended to alter the status quo. Furthermore, the EU was positive that Russia was largely interested in upholding the security aspects of the region. The Ukraine crisis, however, made EU officials realise that Russia sees any external influence in the former territory of the SU as a threat, and will react accordingly. Until the start of the Ukraine crisis, then, the political elite in Moscow had looked at the EU

as an indecisive actor that would not challenge its economic cooperation with Russia. Interestingly, this dichotomy between conflict and cooperation has been most evident in terms of Russia's petroleum relations with the West. While EU member states like Italy, France and Germany entered into economically beneficial partnerships with Russia, the Kremlin often put political pressure on post-Soviet countries by cutting off gas supplies from its pipelines. Although the EU implemented sanctions in the aftermath of the Ukraine crisis and began diversifying its energy supplies, the majority of energy deals struck before the crisis with Italy and Germany still remain intact. Overall, however, the EU's contrasting approaches to cooperating with Russia on petroleum has served to undermine its common approach and fuelled the dichotomy between conflict and cooperation (Godzimirski 2011; Monaghan 2007; Nitoiu 2017: 151-159).

Different views exist on the reasons for Russia's unpredictability and non-cooperative nature towards the West, and how to analyse it. However, although Russia is often viewed as being non-cooperative and anti-Western, Russian foreign policy is rather selective and includes both cooperative and non-cooperative elements. Neoclassical realism presents Russia as a role-player acting on behalf of its self-perception and identity. One of realism's main assumptions is that states aim to provide security, influence and sovereignty. Realists therefore maintain that while the main interests of states remain largely permanent, policy preferences may change if circumstances change. Such changes in context include changes in the international power distribution and in domestic capabilities. Additionally, states will be more inclined to cooperate if their concerns for international prestige and status are considered by other states. Thus, a state's behavior does not have to be either cooperative or non-cooperative, but rather adapts to changing circumstances. As a result, neoclassical realism posits that states may view each other simultaneously as security threats and valuable economic partners. In other words, a state may act conflictual in one policy area, and cooperative in another. In this way, states aim to keep open as many interaction opportunities as possible (Kropatcheva 2012: 30-32). As stated above, this dichotomy can be viewed in Russian-EU petroleum relations as well as in Russian-Norwegian petroleum relations. While Russia acts uncooperatively in its former sphere of influence, such as in Crimea and Ukraine, it wants to cooperate on wider petroleum issues, particularly in the Arctic.

Russia's actions in the Arctic may appear aggressive to some extent because they took place alongside a general worsening of Russian relations with the West. Such an interpretation of

Russia's objectives is, however, incorrect. Russia's Arctic strategy is rather based on the upholding of international law and agreements with other states. Russia's efforts to resolve territorial disputes with Norway are a testament to this. Russian officials have also categorically dismissed the possibility for conflict in the Arctic, as they do not view this region as a potential war zone (Trenin and Baev 2010: 8-9). Thus, although Russian actions in Ukraine have been met with condemnation from the Western world and have made many states uneasy, it would be inappropriate to equate these actions with its interests in the Arctic. Instead, Russia is vocal about being a strong supporter of UNCLOS and emphasises the need for both bi- and multilateral cooperation to resolve any disputes in the region. In itself, the implementation and acceptance of UNCLOS as an overarching framework for Arctic cooperation is important as it profoundly alters the exclusive nature of territorial sovereignty. This is because it denies several spheres of overlapping rights, political authority and responsibilities (Carlson 2013: 23; Jørgensen 2010; Wilder 2010). In this sense, it would even be appropriate to label Russia as more of a 'team player' in the Arctic than the United States (Roberts 2015: 112). These properties of Russian behavior in the Arctic underline that Russia is willing to act cooperatively in this region, all the while breaking international law in other areas. However, the extent of mutual interests between Norway and Russia in the High North has not be sufficiently evaluated. This will be the purpose of the next chapter, which will evaluate the hypothesis claiming that Norwegian-Russian petroleum relations in the High North have remained cooperative because of mutual interests in the region.

4 H_1: Mutual interests in the region

This chapter will discuss the hypothesis stating that Norwegian-Russian petroleum relations in the High North have remained cooperative because of mutual interests in the region. First, mutual interests between these two states will be evaluated. Then, potential conflicts of interest between Norway and Russia will be highlighted. The chapter will end with an analysis of how game theory fits with this hypothesis.

4.1 Norwegian and Russian interests in the High North

In "Perspectives on current and future challenges in the High North", the former Norwegian Minister of Foreign Affairs, Jonas Gahr Støre, notes that the High North was a frozen region during the Cold War (Gottemoeller and Tamnes 2009: 11). While it is still pretty cold, it is becoming a lot warmer in a physical sense, all the while opening up to more human activity (ibid; Jensen 2012). Similarly, Mikhail Gorbachev, speaking in Murmansk at the presentation of the Order of Lenin and the Gold Star Medal to the City of Murmansk in October 1987, emphasized that the Arctic is not only the Arctic Ocean, but where the interests of states belonging to mutually opposed military blocs cross. He hoped for the Arctic and the North Pole to become zones of peace, and for talks to start on the scaling down of military activities here (Miller in Utriainen et al. 1990: 9; Schönfeldt 2017: 184-185). Thus far, the Russian strategy in the Arctic has been dictated by two dominant international relations (IR) discourses, which serve to highlight its foreign policy direction (Staun 2015: 4).

On the one hand, Russian foreign policy priorities are influenced by an IR-realism discourse that puts security first and values patriotism, consumed with exploring or conquering the High North and building up military power to further Russia's national interests in the region. On the other hand, Russia's foreign policy direction is also inspired by IR-liberalism, which puts an emphasis on cooperation and values a respect for international law and cooperation, labelling the High North as a 'territory of dialogue' (ibid). This narrative argues that Arctic states will collectively benefit the most if they aspire to cooperate peacefully. While the visible and memorable media stunt of 2007, when a Russian submarine planted a Russian flag on the Arctic seabed claiming it to be Russian territory, and its immediate aftermath, may be

said to expose Russia's IR-realism, IR-liberalism has since 2008-2009 dominated Russian policy in the High North (Dodds 2010; Janjgava 2012). This change in policy can be said to have been heavily influenced by the Kremlin's decision to leave Arctic relations to the Foreign Ministry and Foreign Minister Sergey Lavrov (Staun 2017: 314).

While the Norwegian-Russian relationship will never be completely independent of the wider Russian-Western relationship, it is neither completely reliant on it. If conflicts were to occur, it is likely that states other than Norway would be at the forefront of Western disputes with Russia. Also, there are clearly mutual interests between Norway and Russia in this region, regardless of their asymmetries. The two countries share the Barents Sea, they are both interested in petroleum exploration and development in these waters, and desire to engage in sustainable resource management. Although the degree of cooperation between these two states depend heavily on the willingness to cooperate with one another, on both sides, other contextual factors also play a significant part. While few expect Russia's relationship with Norway to be of the more troublesome kind, there is a considerable range within which it can fluctuate. However, parallel to Russian–Western relations souring, Norwegian foreign policy towards Russia has experienced a de facto re-centralization. A vital question for the future is thus whether Norway will continue its aspiration to be a leading Arctic player focusing on petroleum development, all the while maintaining its relationship with Russia, or whether an emphasis on climate change under a future Norwegian government will change Norway's strategic priorities, and therefore the view to Russia (Bourmistrov et al. 2015: 20).

4.2 Mutual interests from a game theoretical perspective

Having laid out these properties and narratives surrounding Norwegian and Russian interests in the Arctic, the game theoretical literature now needs to be consulted.

The need to employ sequential game reasoning

States involved in disputes of any kind, such as the delimitation disputes between Norway and Russia in the High North, do not necessarily act simultaneously and without knowing the history of play, like in the case of the classic Prisoner's Dilemma game. More frequently, one

state moves first and the other reacts, knowing exactly what the other state has done. Simple matrix games, like the Prisoner's Dilemma game or the Chicken game, however, do not take into account sequence. In sequence games, the Stackelberg equilibrium refers to the leader-follower aspects of perfect information rather than simultaneous-move games and specifies the meaning of first-mover advantage (Gates and Humes 1997: 95-99).

So, when do sequential moves really make a difference? The answer is when an imperfect information game has a mixed strategy equilibrium, like in a game of Chicken. In such a game, and under simultaneous-choice conditions, players will alter their moves between cooperation and defection according to expected payoffs. In the sequential form, however, no such alterations will take place. Sequential choice ensures that mutual defection is avoided. However, it also means that player two will always be in a disadvantageous position (ibid, 101). First-mover advantage is a well-known feature of sequential move games, as the player moving first gets to choose the direction the game will take and has the opportunity to surprise his opponent. First-mover advantage tends to arise when it is important for players to be able to commit themselves to a particular course of action in order to deter the other player from behaving in a certain way in a particular game.

However, second-mover advantages do exist and include the knowledge of what move the other player has made in the current round and all previous rounds. Second-mover advantage is therefore more important when there is a premium on being able to make flexible responses to the moves made by the other player. Such knowledge makes it easier to pinpoint the right conditional strategy to employ for future plays (Romp 1997: 36). Thankfully, players in game theoretical scenarios can move away from their self-interested nature to behave reciprocally. Reciprocity entails that players, in response to friendly moves from their opponent, act more cooperatively than envisioned by traditional, self-interest predictions (Fehr and Gächter 2000: 159-160). In this sense, the continuity of relationships can help generate behavior that would otherwise be viewed as altruistic (Granovetter 1985: 492). These properties of game theory will be illustrated in an extensive form representation of a Stag Hunt game in chapter 5.

Realist assumptions

According to realism, although states have many different goals, their main goal is survival. This primary goal makes states incredibly aware of any threat to their ability to protect their

independence and security. Accordingly, realism supposes that a major goal of any state is to halt the rise in the relative power of other states. In this sense, states may even sacrifice opportunities to increase their own power to ensure a more level distribution of power worldwide (Grieco 1988b: 602). Similarly, the central question for the work on anarchy is how cooperation is possible when players, such as Russia and Norway, find themselves in a Prisoner's Dilemma. This is any situation in which players have a certain preference ordering. This preference ordering starts at exploiting the other, then mutual cooperation, then mutual defection, and ends at being exploited oneself. As a result, two key questions need to be addressed in terms of these preferences and how they come about. Firstly, how do we know what the preferences of players are? Secondly, how are these preferences established? The first question is the most obvious one, as it addresses the issue of how it is possible to know that a situation resembles a PD (Jervis 1988: 322).

Additionally, a state will worry about relative gains advantaging a partner in one situation as this could lead to a shift in bargaining power favouring the partner. This may subsequently lead the partner to renegotiate and better its terms of agreement in the situation at hand, as well as in other common ventures. From this line of argument develops the realist notion of the relative-gains problem. This problem specifies that a state will join, leave or limit its commitment to any cooperative agreement if it suspects that a partner is achieving, or will likely achieve disproportionate gains because of their common venture. The issue here is that conventional forms of the PD game do not take into account the relative-gains problem. The assumption must therefore be that players achieve similar payoffs or believe they do so, regardless of whether the outcome of the game is mutual cooperation or mutual defection. However, the completely opposite assumption could also be true, as players believe both of these outcomes to be highly unequal. Such a view of the PD game by players may be because players do not know, or do not scrutinise, the magnitude of the other player's payoffs or interval ranges. In general, from a realist point of view, a state may be highly dissatisfied if its partner's payoff from a game, or payoff-range, outstrips its own (Grieco 1988b: 603).

If states care mainly about maximising their power advantage and not their absolute gains and losses, many of the strategies that should, in theory, facilitate cooperation in a PD game no longer play out in a cooperative manner. Thus, Axelrod points toward the irony that the strategy of reciprocity, also known as tit-for-tat, that has proven so successful in computer simulations of PD games, cannot triumph in any individual game. Instead, this strategy works

well because it collects many points when matched against fellow cooperators and is not highly exploited when met with more competitive strategies. However, if the main rewards in international politics are concerned with relative gains, a strategy that can produce a tie, at best, will not be deemed attractive by any state operating under realist assumptions. This concern is likely to be greater in matters relating to security than to economic concerns, but is also present in the latter, particularly because military and economic matters are tightly connected (Jervis 1988: 334-335).

Preferences may also change through the process of the interaction itself. If two states are hostile, one state will probably suspect that anything the other state pushes is bad. Therefore, an outcome that was formerly supported will be looked at with scepticism if the other state favours it. Correspondingly, if a state takes a strong interest in an issue, this can lead the other state to formulate a completely different preference. The conflict process therefore produces interests and preferences rather than being generated by them (ibid, 327). However, when realist Stephan Krasner states that much of international politics lies on the Pareto frontier, he claims that states already have the necessary means to cooperate to such an extent that no further moves can make them all better off without making anyone worse off. In this respect, offensive realists see important situations in international politics as PD games. In such situations, one or more states are prepared to risk war in order to conquer territory, or have security goals that completely contradict with that of other states. According to this line of reasoning, endorsed by John Mearsheimer, states maximise their own power in order to make sure they are safe or because they want something that they believe power will bring them (Jervis 1999: 47-48).

The disadvantages of employing the Prisoner's Dilemma game

In this regard, it must be stated that conventional forms of PD games do not model the relative-gains element of state preferences because they do not employ the realist definition of state utility. From a realist point of view, states are positional and assess all international relationships, including those based on mutual interests, in terms of their impact on defensive power capabilities. Contrastingly, PD analyses assume that states are atomistic and act as 'rational egoists' (Keohane 2005) solely on the basis of calculations of individual absolute gains. It is this assumption of state atomism that prevents conventional PD games from sharing realism's understanding of the relative-gains element of state preferences or its

inhibitory effects on the willingness of states to cooperate. PD games would shed light on the process of international collaboration more powerfully if they could more explicitly model state positionality, as well as the resulting structure of state preferences, such as the "desire for larger over smaller absolute gains and for smaller over larger gaps in gains favouring partners" (Grieco 1988b: 606). In order to be able to model such a structure of state preferences, PD games would have to be redesigned so that states would know their own payoffs and those of their partners, and consequently would be able to compare the magnitude of their own payoffs with the payoffs of their partners (ibid). The particular difficulty confronted by game theorists at this stage is that any player's optimal or utility-maximising choice is oftentimes dependent on how the other player moves. However, the normal form of a PD game highlights the nature of this complex decision problem, as both players choose strategies simultaneously and therefore cannot observe what the other player does. Subsequently, players may observe choice alternatives as the extensive form game unfolds, but their initial choice of a strategy has already determined their conditional responses. How, then, do players ultimately choose their strategy in an environment of mutual dependency? This is the central problem of game theory (Ordeshook 1986: 114-115).

It is necessary at this point to stress that non-cooperative game theory does not imply that players will never work together. It does imply, nevertheless, that this will only occur if players view cooperation to be in their own self-interest. Thus, players will only cooperative if they voluntarily choose to do so, and not because they have to (Romp 1997: 2). In other words, the fact that cooperation can be supported in equilibrium does not equate that states will cooperate (Bó and Fréchette 2018: 71). Such an individualistic approach to game theory is consistent with neoclassical economics. Players are also assumed to be instrumentally rational, and therefore expected to act according to their own self-interest, as mentioned in chapter 2. However, given the complex nature of many decisions and the information overload associated with them, this assumption seems unrealistic. Further, experimental evidence demonstrates that players, instead of acting completely rationally, adopt simple, suboptimal rules when making decisions. Nevertheless, the justification given for this rationality assumption is that it seeks to show how rational players would solve complex decisions if they were indeed fully rational (Romp 1997: 2-3).

Defensive realists take a position on the role of unnecessary conflict that has more in common with neoliberals. Scholars such as Glaser and Jervis see the Prisoner's Dilemma as capturing

important dynamics of international politics, especially through the operation of the security dilemma. This dilemma highlights ways in which the attempt by one state to increase its security has the unintended consequence of decreasing the security of others. States in the international system will often be willing to settle for the status quo and are likely driven more by fear of others than by the desire to make gains for themselves. According to this model of international politics, both perceptual and structural reasons coincide to make the actions states take to protect themselves self-defeating. In many cases, it is the negotiating process among states that itself generates conflict rather than expose or enact pre-existing differences in objectives. In most circumstances, both states would, in fact, be satisfied with mutual security. This is as international politics represents tragedy rather than evil as the actions of states make it even harder for them to feel safe (Jervis 1999: 49). Defensive realists thus regard the properties of the situation and the other state's objectives as critical. This helps to explain why scholars of this kind come up with differing policy recommendations if they have contrasting views of the other state (ibid, 52).

To attempt to solve this tendency to defect, leadership situations in what would otherwise be known as Prisoner's Dilemma games are common within international relations. The role of leader often falls to the most well-established or largest of the players, in this case Russia. In such circumstances, the largest player may accept the leadership role since its own interests are closely tied with the other player. Further, if the largest player constitutes a substantial fraction of the issue or region, such a convergence of interests would seem obvious. In such a scenario, the largest player would be expected to behave more cooperatively than might otherwise be the case (Dixit, Skeath and Reiley 2015: 394). This logic works for Norwegian-Russian petroleum relations in the High North and demonstrates how game theoretical modelling may be employed to analyse this case.

The extent of mutual interests between Norway and Russia

One of the fundamental goals of any game theoretical analysis is to predict and explain the outcome of social interactions, whether between individuals or larger entities like states. These players may have partly or completely different interests. Non-cooperative games are therefore characterised as those where opposite interests exist, as well as mixed interest games where agreements are not enforceable (Harsanyi 1962b: 141-143). In most applications of game theory, the players are motivated exclusively by self-interest. However, such a

prerequisite is not necessary for the use of game theory to be helpful. Rather, there is evidence that many other types of motivation are present within bilateral relations, such as those between Norway and Russia in the High North (Hovi and Rasch 1993: 25).

If the horizon of a game is indeterminate, this could mean one of two things. The first is that both states know that the game will be repeated infinitely. The second is that states know that the number of repetitions has an upward limit. However, none of the states know when the game will actually end. In both scenarios where the length of the game is unknown, there is still a probability that the game will continue for at least one more round, after the current play. This applies regardless of how many rounds have already been played. Such uncertainty ensures that the backwards induction argument no longer applies, since both states risk that a violation on their part may be punished in the future. As a result, it is no longer rational for the states to defect. It may now, however, be rational for the states to comply at all stages of the game (Hovi 1998: 93).

Axelrod's conflict of interest insights

Axelrod (1970) differentiates between two kinds of conflict or conflictful behavior. The first includes instances such as strikes and wars, while the other is known as conflicts of preferences, which he calls conflicts of interest (Nagel 1975: 154). The term conflict, used interchangeably with conflict of interest by Axelrod, "is a property of the preferences of the participants and the structure of the situation in which they find themselves" (1967: 87). What is tested in this respect is how a state's behavior changes in situations with different amounts of conflict of interest. When imagining conflicts of interest, two extremes can be envisioned: the first is a total conflict of interest and the second is no conflict of interest. The degree of conflict in any strategic interaction may be employed to predict the behavior of the states in the game. In this sense, a conflict of interest may be defined as the incompatibility of objectives between two states. As such, any conflict of interest is a combination of the preferences of states and the circumstances in which they find themselves (Axelrod 1970: 5). These two opposing positions of either a maximum or a minimum conflict of interest, represented by Norwegian and Russian utility, are represented in figures 5 and 6 below.

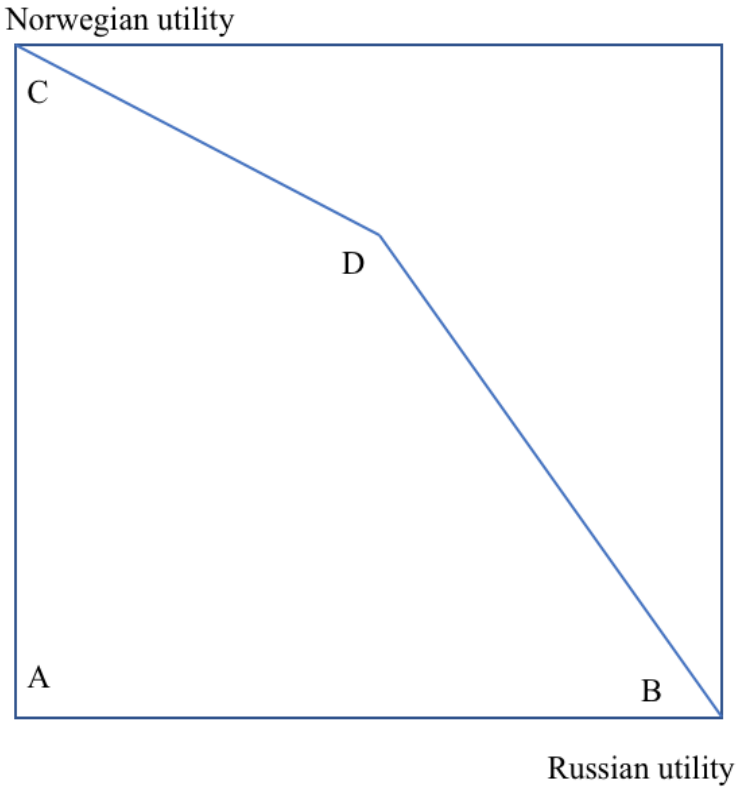

Figure 5. Maximum Conflict of Interest (ibid, 83).

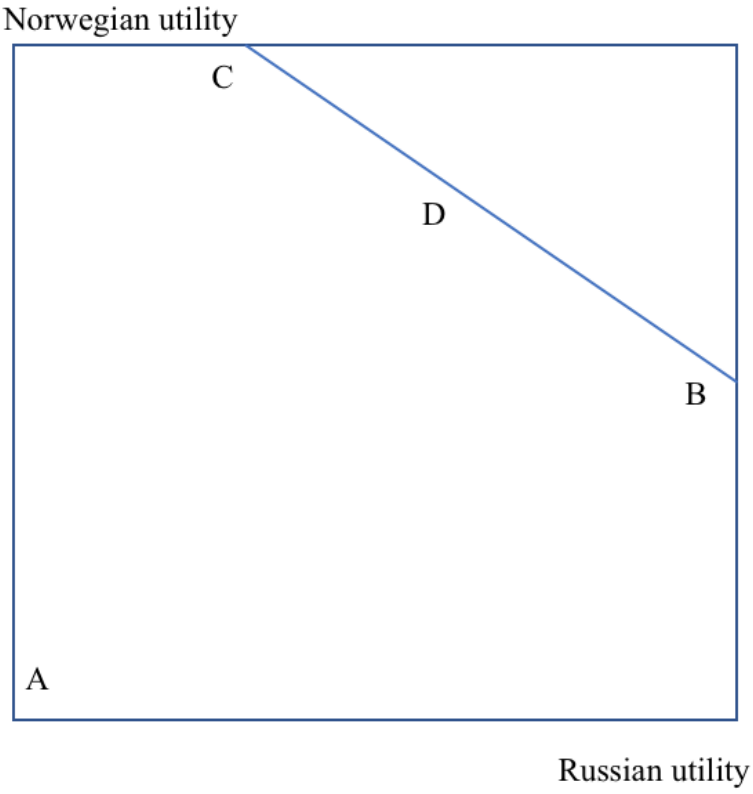

Figure 6. Minimum Conflict of Interest (ibid, 84).

As illustrated in the two figures above, one point is enough to set an upper bound and a lower bound on the amount of conflict of interest in a given bargaining game. If the Russians would have to be at least 60% sure of getting their draft before preferring not to settle for the compromise and the Norwegians would have to be 70% sure of getting their draft through before preferring not to settle for the compromise, then D = (.6, .7). As the region of feasible outcomes is thought to be convex, regardless of which other compromises are possible, the maximum conflict of interest would be .35. This happens when each state is actually indifferent between settling for the other's draft treaty and having no agreement, making the minimum conflict of interest possible equal to .24. Therefore, the onlooker knows that the conflict of interest is between ¼ and 1/3 (ibid, 83). In less formal and mathematical terms, the more the region of feasible outcomes bulges, the less conflict there is to be perceived. The correct measure of conflict of interest in bargaining games can therefore be simply put. The more the region illustrated in the figures above bulges outwards, or the greater the area to the right of point D, the less compatible the objectives of the states in the game are (Axelrod 1967: 92).

In the main official Russian strategy document on the Arctic, "Principals of state policy of the Russian Federation in the Arctic to 2020 and beyond" (Staun 2017: 319) natural resources are introduced as early as in paragraph 4.a as Russian "national interests" (Øverland 2010: 867). Given the emphasis Norway also puts on the High North potentially becoming a future petroleum province in its High North strategy, these two states can be said to have significant mutual interests in this region. In this respect, Schelling's discoveries relating to scenarios where a mixture of conflict and common interest preside in game theory, can also be applied to a situation where interests are largely aligned by way of tacit coordination. This can be said to be the case when it comes to Norwegian-Russian relations in the High North as these states have significant mutual interests. As such, pure coordination is a game of strategy equivalent to a strategy of conflict. Imagine a game in which each state's best choice depends on the action he expects the other state to take, which he knows depends on what the other state's expectation of his own move is. In such circumstances, states' convergence of expectations is essential to create focal points that normally arise out of considerations that have their grounding outside the pure formalities of the game (Dixit 2006: 220-1).

Game theory, therefore, provides a phenomenal framework for discussing the issue of conflict in social science situations. The description, provided by game theory, of a two-state

interaction, highlights the full set of available strategies and the associated payoffs for each state regardless of how the game of play unfolds. In a zero-sum game, for instance, there is a total incompatibility of goals. This is because there is no room for cooperation. The opposite extreme is where the interests of states fit together perfectly. In such a partnership situation the outcome most desired by one state is also the outcome most desired by the other state. However, neither of these extreme examples are very frequent in real life. Instead, most relevant problems in political science lie between these two extremes. In such mixed-motive games the states have an incentive both to compete and to cooperate with each other (Schelling 1960). Therefore, an important question to ask is whether the game between Norway and Russia in the High North is more like a zero-sum game or more like a partnership game. The problem is then to develop a measure of the amount of conflict in the game at hand. The cardinal index of utility, which assigns a number to the value each state attaches to each outcome, has been provided by Von Neumann and Morgenstern (1947). This theory of utility is always consistent with the assumption that a state will maximise the mathematical expectation of their utility (Bishop 1963: 560). Thus, if a state prefers A to B and B to C, then that same state will also always prefer A to C (Axelrod 1967: 88-89).

The need for games to be played infinitely

If a game is repeated indefinitely, cooperation may develop. The issue is then to find out which conditions are necessary and sufficient for this cooperation to emerge (Axelrod 2006: 11). First and foremost, states need to have a range of mutual political interests, including military and economic interests. Second, the economic arrangements of the two states need to be 'nested' in larger political alliances for cooperation to succeed, as this promotes compliance. Both of these conditions should help combat realism and the relative-gains problem (Grieco 1988a: 504). Through rational learning by way of repeated games, states can learn to play the game, one move at a time. This happens because states start with hypotheses about which strategies the other state may employ and through playing repeated games update their strategy by observing the actions of the other state in the game (Morrow 1994: 305-306). When it comes to the Norwegian-Russian petroleum relationship in the High North, these properties can be said to be present, particularly given their commitment to the Arctic Council (AC) and international law concerned with the Arctic. While both these states certainly have mutual interests in this region, it is uncertain to what extent their respective interests align.

Contrary to the classic battle of the sexes game, a two-player coordination game where a couple decide where to meet, many games do not have a cooperative outcome when played once, but rather have cooperative outcomes if repeated. If a game is repeated infinitely then for both states cooperating is an equilibrium, as repeated play can allow states to punish non-cooperative behavior. It can be shown that, if the game is to be played infinitely, then the optimal strategy for both states is cooperation and this behavior will be an equilibrium. However, this is not the only equilibrium. Defecting forever is also in equilibrium (Morton 1999: 188-189). Overall, when a game is repeated, the number of possible equilibrium outcomes will most likely increase drastically, but only if states in the game are sufficiently patient (Bó and Fréchette 2018: 68). This property of repeated games is often called the folk theorem as it has no particular author and is therefore considered part of game theory folklore (Morton 1999: 189).

Keeping in mind these ideas from game theory, it is fairly clear that Norway and Russia have mutual interests in the High North. First and foremost, Norway shares a 196 km long border with Russia in the region and being neighbors in this sense has been a significant factor in post-Cold War relations. Since the turn of the century, Norway has had to adapt to new political reforms and a new political atmosphere on the Russian side, but these obstacles have largely been overcome and relations have therefore been strengthened by it (Hønneland and Rowe 2010a: 12-14). In fact, Russia is referred to as a cooperative partner in every chapter of Norway's High North documents. Norway also emphasizes that it will engage in a "pragmatic, interest-based and cooperation-oriented" policy towards Russia (NMFA 2006: 15). This is because the Norwegian government is aware that sustained Russian involvement is paramount for continued resource use and environmental management in the Barents Sea and the wider Arctic region (Rowe 2014: 76).

It can be argued that Norway and Russia's mutual interests in the High North are the same as the mutual interests between the West and Russia in this region. However, there are some important differences. Although the border between Norway and Russia has helped secure neighbourly relations between these two states, this has not been the case for instance between Russia and its neighbour Ukraine, particularly in recent years. A reason for this is that while Russia's relationship with many of its former Soviet republics is troublesome and characterised by a Russian desire to still control these now independent states, such a

relationship has never existed between Norway and Russia. Thus, despite them being neighbours, Russia has never attempted to conquer Norway or drastically influence its policies, like it has with Ukraine, especially when a possible EU membership for Ukraine appeared to be on the cards.

Furthermore, Russia is currently experiencing an excessive Western presence near its borders, as it aims to use its newly acquired wealth to regain its once great power status. This strategy should be considered one of soft-balancing. This assertiveness and Russia's material capacities can be viewed as a strategic response to its oil and gas revenues (Piskunova 2010: 852). This is what separates Russia's relationship with the wider Western world and its relationship with Norway. Both states are dependent on each other's petroleum resources and expertise in order to explore the reserves present in the High North. Norway knows that it is paramount for its potential future Arctic resource use that it can rely on Russian petroleum cooperation, and this is not only to secure friendly relations in the High North. Rather, Norway hopes to be able to exchange high-tech petroleum technology for accessing oil and gas fields on the Russian side. Russia, on the other hand, knows that it needs to be open to cooperate with Norway and Equinor, formerly Statoil, in order to extract the petroleum resources that can be found in its rich reserves in this region.

In this sense, the Norwegian-Russian petroleum relationship in the High North differs from that between Russia and the wider West because of two main factors: Norway has historically been tolerant of the SU's and Russia's policies, which the EU and the wider West has often condemned and sanctioned them. Although Norway has been part of sanctioning efforts due to it being a member of NATO, it has not been the driver of such responses. Additionally, Norway can lend crucial technology and expertise to Russia so that its dream to exploit High North petroleum reserves may become a reality in the future. In order to facilitate this, Russia will have to exchange some of the resources found in its High North reserves in order for Norway to provide its sophisticated technology. All in all, both mutual interests and petroleum interdependence help explain why Norwegian-Russian petroleum relations in the High North have remained cooperative. However, when mentioning mutual interests, the issue of petroleum interdependence often crops up. The latter hypothesis and its potentially greater explanatory power will therefore be discussed in the following chapter.

5 H_2: Both states can benefit from the others' petroleum resources and expertise

This chapter will discuss the hypothesis stating that Norwegian-Russian petroleum relations in the High North have remained cooperative because both states can benefit from the others' petroleum resources and expertise. The chapter will begin by evaluating the state of petroleum developments today. Russian dependence on Norwegian petroleum technology will then be discussed. Next, Norwegian dependence on Russian petroleum fields will be considered. The chapter will end with an analysis of how game theory fits with this perceived petroleum interdependence.

5.1 The state of petroleum developments today

The price of oil is a key factor driving developments in the High North. When the price of oil is high and consistent, the region becomes more interesting as a potential site for exploration. When the price of oil is relatively low, on the other hand, and when the cost of exploiting and transporting Arctic oil remains relatively high, there is little incentive for share-holding companies to engage in risky exploration in this region. Correspondingly, access to resources and security of delivery are also important factors to consider. The concern regarding the former is political stability in the next 20-30 years, which is the typical length of an investment perspective for major developments (Orheim 2006: 32). As regards security, the Arctic is definitely more attractive than many Middle Eastern areas (Jakobsen and Melvin 2016: 26-28; Kratochvil and Tichy 2013). So far, the Russian part of the Barents Sea, which encompasses Shtokmanovakoye, has been developed as an offshore gas field, and it is 30 times greater than the Norwegian gas field Snøhvit. The latter, and smaller field, is estimated to have a gross value of $25 billion (Orheim 2006: 32).

Petroleum resources is still a highly contentious topic, particularly when it comes to issues such as energy security and dependency (Jakobsen and Melvin 2016: 26-27; Maugeri 2003; Ziegler 2012). The latter issue is especially poignant in terms of the EU's dependence on Russian gas (Angell, Eikeland, and Selle 2010: 326-327; Baev 2012: 179-180; Baran 2007;

Ermida 2015; Kratochvil and Tichy 2013; Orheim 2006; Hønneland and Rowe 2010b: 117, 129; Roberts 2015). Norway became an oil nation in the early 1970s, while engagement towards the third world was also on the up. The thought of a Norwegian position as both a consumer and a producer, and in between poor and rich countries, resonated in Norwegian political circles at the time. The key ambition was to secure a stable and high oil price. This ambition could help to serve more than one purpose as it would contribute to securing stability and predictability in the world economy and would incentivise the development of alternative, renewable energy resources (Tamnes 1997: 424).

In the 1980s, during the Cold War, the High North was a key strategic region for Norway. After the end of the Cold War, NATO's objectives were altered, and the High North was given less priority in the face of new challenges. From a security perspective, Norway risked being marginalised. The change of power in the Kremlin in 1985 signalled the end of the SU and the Cold War. The new, charismatic Soviet leader Mikhail S. Gorbachev quickly gained traction in Norwegian politics. As time went on, Norway began to develop a two-sided strategy towards the new Russia. The new policy was built on two distinct pillars, namely deterrence and reassurance. On the one hand, Norwegian authorities attempted to use this change in power to further cooperation in the High North. This strategy was developed alongside the ambitious goals of 1992 regarding closer cooperation in the Barents region, which was a multilateral effort. The main goal was to promote growth and stability in the High North by incorporating Russia into an international cooperation network. Further, Norway was worried about security, particularly in relation to the potential for conflict over unresolved borders and extensive natural resources. One issue was that Russian authorities stuck by the traditional goal of Norwegian-Soviet shared ownership of the resources in the Barents Sea (ibid, 133-135).

Throughout the 1990s, the development of Northwestern Russia contributed to the formation of a Norwegian High North policy. Threats of armed aggression were no longer at the top of the political agenda, but the region was considered an ever-increasing environmental threat in the form of nuclear waste and polluting industry on the Russian side. These perceptions have formed the basis for a general opinion among Norwegians of Russia as an "environmental laggard" (Jensen 2010: 296). Therefore, the petroleum for development discourse does not say that Norway should refrain from petroleum extraction in the Barents Sea to protect the environment, but rather get up and running quickly to help the Russians engage in petroleum

activities that are more environmentally friendly. An important premise of this argument is that the Russians will probably start extraction in the region soon, irrespective of Norwegian involvement (ibid, 295-8).

Even if experts admit to the importance of the Arctic region for the petroleum sector, the profitability of Arctic exploration remains unclear. Indeed, according to several evaluations, exploration could be profitable only if high-technology machinery is used and if oil prices remain over $100-$120 a barrel, a level not seen since mid-2014. The Arctic project is therefore a very important political issue, but one that can easily become delayed (Piskunova 2010: 857). Currently, apart from a few oil and gas extractions in the Norwegian Sea, Arctic Norway has hosted petroleum explorations for the most part, while production has occurred in the North Sea further south. Now that North Sea fields are gradually drying up, the prospect of finding new reserves further north is becoming a more promising and necessary endeavour (Glomsrød and Aslaksen 2009: 58).

5.2 Russian dependence on Norwegian petroleum technology

In "Strategy for the Development of the Arctic Zone of the Russian Federation and National Security Protection for the Period up to 2020" from 2013, the current state of the Arctic Russian zone is characterized by several risks and threats (Schönfeldt 2017: 195-196). The first is a lack of Russian equipment and technologies for exploiting and developing offshore hydrocarbon fields. Another worry is high energy consumption coupled with low efficiency of natural resource extraction. Finally, the costs associated with production in this region and low productivity are considered threats (ibid). These Russian worries are also grounded in reality. Russia's Northern Fleet has struggled to modernize since the 2008 financial crisis halted its ability to finance modernisation. Currently, Gazprom lacks the capacity and knowledge to master certain offshore technologies and will therefore require foreign partners in this process. The Russian port system is also in a poor state. All of these factors work to weaken Russia's ability to project power in the Arctic region (Laruelle 2011: 83-84).

Early in 2010, Shtokman Development AG (SDAG) decided to postpone the Shtokman project for three years. This was a natural decision given that the plan to bring to shore the

first gas as early as in 2013 was now completely unrealistic. Future gas prices would also affect the development of the field. The Shtokman development would have been the largest industrial development in the High North to date, but the environmental and security challenges associated with the development would be immense. In 2006, Russia created a fund from its oil revenues, similar to the Norwegian oil fund. However, the financial crisis and the attempt to stabilise the Russian ruble have since drained most of it. Future oil and gas prices will therefore be very important to the Russian economy. This is because oil and gas are not simply revenue streams for Russia, but also important foreign policy tools for Russian authorities (Angell, Eikeland, and Selle 2010: 326-327).

The Arctic is a key priority for Russia's ambitious and authoritarian leadership, especially because of its particular appeal to the national Russian consciousness. President Vladimir Putin has personally committed to advancing Russia's interests in the High North, and the potential for exploiting petroleum-rich reserves in this region is undoubtedly a key part of this commitment. Russia's Arctic dreams, however, seem likely to eventually crash with the harsh reality of Russia's stagnating economy. Arctic reserve estimates and the assessments of their accessibility are increasingly viewed as being seriously exaggerated. While several different figures are present in Russian debates on the development of the vast Arctic, the only relatively solid estimate remains the 2008 USGS resource estimation, which has already been overtaken by new discoveries, particularly of unconventional sources such as shale. Russian experts have had to admit that offshore fields, like the one discovered in September 2014 by Rosneft and ExxonMobil in the Kara Sea, would only be profitable with oil prices ranging from $70-$100 a barrel. This is a reality that seems relatively far-fetched these days although oil prices are currently on the up. Simultaneously, the Russian defence budget is experiencing more cuts, and the Arctic lobby is one of the losers in this bureaucratic tug-of-war. The key problem with Russia's vision for the development of the Arctic is that political will wins over economic rationale, and as the former is volatile, the latter is starting to disappear. Furthermore, Western sanctions make offshore exploration close to impossible given the lack of modern technology, and funding from the Chinese is not currently a sufficient replacement. Meanwhile, Russia's corruption and bureaucratic mismanagement interferes with plans to exploit resources onshore. Thus, there is a clear mismatch between promoting international cooperation, building up military capabilities, and exporting hydrocarbons all at the same time (Baev 2017).

The result is an Arctic strategy that is fundamentally unsustainable and incoherent, and this leaves Russia heavily disadvantaged (ibid). Accordingly, Russia is presently dependent on Norway for technologies needed to access natural resources that are difficult to get to. The Shtokman gas field, one of the richest in the world, exemplifies this dependency. While the American companies ConocoPhillips and Chevron, alongside British Petroleum, were very active during the submission process, they were suddenly pushed aside without much of an explanation (Hønneland and Rowe 2010b: 124-126). Then, Norwegian Statoil was awarded a 25% share of the exploration, as it is the only company equipped with the necessary drilling and extraction technologies for exploration in such severe natural conditions. As a result, Norway has become a necessary partner. This is a prime example of Russia's soft balancing strategy. By preserving the most precious source of its wealth, Russia is effectively protecting itself from the perceived American threat (Piskunova 2010: 860).

Developing offshore Arctic petroleum reserves, as mentioned, require a significant amount of resources and advanced technology, something that Russian state-controlled giants Gazprom and Rosneft currently lack. Nonetheless, delimitation of the marine space and the seabed in the Barents Sea is a step in the right direction for Moscow's intentions to start developing the resources under the Arctic seabed. As Kremlin politicians have uttered repeatedly, the transformation of the Arctic region into a resource base for the Russian economy is a strategic priority for the state. For instance, Russia's biggest shipping company, Sovcomflot, has already announced a new strategic concept tied to offshore petroleum exploitation in the Arctic. The hope is that this strategy will result in a greater number of ships capable of carrying LNG resources and oil extracted offshore. In fact, Russia's Arctic Strategy of 2013 has scaled down on some of the overly optimistic deadlines present in the original strategy. This version is also more open to cooperate internationally in order to solve some of the key issues faced by Russia's energy sector, namely the lack of technology, know-how and practical experience in exploiting petroleum fields in the Arctic. In fact, the document plainly states that Russia on its own neither has the resources nor the technology to exploit petroleum fields in offshore parts of the Arctic (Choi 2014: 70; Zysk and Titley 2015: 320).

While Russia is unlikely to follow the example of the US regarding the Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC), Putin does sympathise with President Trump's worries. Russian authorities view the Paris Agreement as part of the global economic low-carbon trend, which endangers the national economy's

revenues from the export of oil and gas. Furthermore, other global trends already affect Russia. The development of Arctic offshore petroleum resources has been faced with several obstacles. The development of the Shtokman gas field was cancelled because of cost issues, combined with falling prices in global markets. Later, falling oil prices meant questions were raised regarding the profitability of other Arctic offshore projects. In the short term, these have been delayed because of Western sanctions against Russia. Currently, only one offshore project is in operation, the Prirazlomnoye field in the Pechora Sea (Kokorin and Korppoo 2017: 3-10). The Russian leadership is currently choosing to ignore signals about the gradual phase-out of oil, and rather depends on scenarios predicting that the fossil-fuel era will continue. The Paris Agreement is viewed as part of a global trend that will create massive uncertainty for Russia's economy, but only sometime in the distant future. A failure to realise the urgent need for action, including the impact of the climate variable, may send the country into a deep crisis. This is largely due to the fact that a global decrease in oil demand could serve to slash Russian revenues while costs associated with extreme weather events could increase substantially (ibid, 12).

5.3 Norwegian dependence on Russian petroleum fields

The resource pictures in Norway and Russia differ greatly. While Russia has several unexplored areas, Norway's options are more limited, a fact that has become increasingly evident after the year 2000. The Norwegian petroleum industry has therefore strongly advocated for increased activity in the North. On the Russian side, however, companies have been more hesitant. Both in Norway and in Russia regional interests have generally been positive towards development, but regional concerns are greater in Norway. In Norway, environmental considerations have already worked to slow down developments. Contrastingly, environmental constraints have so far not played any noticeable role in Russian developments. The role played by the environment, however, is not irrelevant. In Russia, environmental regulations have the potential to stop or delay industrial development, but such concerns are brought in at a later stage in the planning process than in Norway. While Russian companies are expected to play a dominant role in the development of offshore resources, they are currently not ready to play this role, and development is therefore slow. The main driver for the Shtokman development, for example, was Gazprom's interest in the LNG

market. While uncertainties relating to costs and time frame were evident from the start, it was more general market uncertainties that took over from 2009. The financial crisis caused gas demand in Russia's export markets to fall. This was even more so the case within Russia, which caused a reduction in Russian gas production by 12.4% that same year (Moe 2010: 244-245). Regardless of the delimitation dispute, which will be expanded on in chapter 6, and the disagreement concerning the continental shelf around the Svalbard archipelago, the petroleum relationship between Norway and Russia has been cooperative in nature. Neither state have let disagreements spill over into areas where cooperation may occur, or have occurred previously (ibid, 247).

After its international law violation on the Crimean Peninsula, Norwegian politicians condemned Russia. This unison criticism was primarily expressed through the Norwegian elite supporting the sanctions implemented by the North Atlantic Treaty Organisation (NATO) in accordance with the European Union's penalties. This Norwegian condemnation was also visible in the political rhetoric. Norwegian members of parliament clearly stated that the Russian handling of Ukraine and Crimea was unacceptable. Bilateral ties were virtually suspended for 20 months after the annexation of Crimea. During this time, the conception of Russia as an aggressor, which viewed foreign policy as a zero-sum game without consideration for other interests, in line with realism, was clearly present among the Norwegian political elite (Jervis 1998: 986). The Norwegian government chose to reply to these violations by strengthening NATO and more general ties between liberal democracies (Nilssen 2015: 35–54). However, while the government has been consistent in expressing its condemnation of Russia for its actions in Ukraine, it has also underlined the possibility for cooperation bilaterally. In other words, there exists a duality in the Norwegian policy towards Russia, intended to serve the fact that Norway is a NATO member all the while comforting its neighbour Russia, previously the SU. This balancing act has gradually become more important again since Russia's annexation of Crimea (Rowe 2018: 7-8).

As Norway is a natural gas supplier to the EU, it is as viewed as a competitor by Russia. In 2006, for instance, Norwegian gas compensated for a decrease in the Russian supply due to the Russia-Ukraine gas conflict (Baev 2012; Baran 2007). Similarly, when plans to develop the Shtokman field failed in 2012, after the treaty was signed, this was largely because Norway's Statoil gave up its shares in the project as there was no market for the gas due to booming shale production in the US. Despite their history of cooperation, the question has

often been whether these two states can overcome their internal differences in terms of the state-controlled Russian political system versus the more open Norwegian market model. Evidently, there have been strong dissimilarities in the type of petro-state that each player has represented with varying relations between state and society (Orttung and Wenger 2016: 90). Nonetheless, this does not seem to have stopped either Norway or Russia from wanting to cooperate with one another, particularly on petroleum matters pertaining to the High North.

5.4 Petroleum interdependence from a game theoretical perspective

According to game theory, the signaling games literature is problematic in that it assumes states to be unitary actors where either the head of state decides policy or decision-makers hold exactly the same preferences as one another. Rather than focusing on exactly why beliefs change, it is rather necessary to understand how and when decision-makers are able to convert their beliefs into policy. Thus, a comprehensive understanding of state interactions need to clarify not only why beliefs change but also which circumstances do or do not influence policy change (Walsh 2007: 446). In this sense, it is vital to examine how the Norwegian government has changed its behavior towards Russia, not only in relation to changes in petroleum developments, but also in relation to recent Russian international law violations.

Russian aggression towards the West

The aftermath of Russia's annexation of Crimea and war in eastern Ukraine in 2014 has witnessed a heated debate surrounding how to comprehend current Russian foreign policy. The discussion has largely centred on the need to counter and balance Russia's 'aggressiveness', due to its unpredictable and rule-changing behavior (Staun 2017: 314). However, contrary to the view that it is impossible to cooperate with Russia these days, Russia's policy towards the Arctic makes it look nothing like a classic revisionist power. In this region, it rather appears like a power with a grounded, long-term strategy. It is a paradox that Russia, while continuously breaking the 'rules of the game' in Ukraine, has obeyed the 'rules of the game' in the Arctic region (ibid). To exemplify, Russia has been a great supporter of the AC and the Barents Euro-Arctic Council (BEAC) and has followed the rules when it comes to The United Nations Convention on the Law of the Sea (UNCLOS) delineation, as well as meeting deadlines associated with the Commission on the Limits of the

Continental Shelf (CLCS) (Carlson 2013). Further, it has not acted threatening towards its neighbors or members of the AC (Staun 2017: 314). Nonetheless, the uncertainties surrounding political developments in Russia may affect the development of petroleum resources in the northern part of the country. The driving forces behind these developments may be observed at the national level in Russia as well as within the wider international development discourse (Angell, Eikeland and Selle 2010: 183).

Currently, Russia is reacting to an excessive Western, and particularly American, presence and threat near its borders, by using newly acquired wealth to regain its great power status. This strategy should be considered one of soft-balancing. Such a strategy entails a limited military buildup coupled with preventative measures intended to delay or discourage aggressive policies by another great power. The end goal of this kind of strategy is to gain the necessary military and economic capabilities to protect national sovereignty. The economy is crucially important for this strategy and in Russia's case, the petroleum sector is vital to its economy. As a matter of fact, Russia's assertiveness and material capacities can be viewed as a strategic response to its oil and gas revenues (Piskunova 2010: 852). This concern and a need for oil prices to be high is mirrored by Norway, but because Norway has embraced the impacts of climate change to a greater extent, this is not as obvious as in the case of the currently struggling Russian economy.

Norwegian diplomacy towards Russia

As alluded to above, Norway and other states reacted to Russian international law violations by sanctioning this behavior. However, the literature concerned with sanctions tell us that they only rarely make the receiving country change its policies. Another well-established finding is that when do sanctions work, it is often at the threat stage, even before the threatened sanctions have been implemented (Hovi 2008: 105). Just like the actions of other states affect Russia, changes in energy markets affect both Russia and Norway. As of today, it is impossible to deny the fact that Russia is an energy-intensive state and a major petroleum exporter. Global energy markets will thus unquestionably have an impact on developments in the Barents Sea and the surrounding areas. However, the uncertainties associated with this region extend far beyond oil price fluctuations (Brunstad et al. 2014: 197-198).

Evidence from experimental studies suggest that players, rather than being fully rational, make complex decisions based on suboptimal rules. This is as players are mutually interdependent in these situations. This means that the welfare of one player is determined by the actions of other players in the game, at least to some extent, and this leads players to act strategically rather than purely basing their moves on instrumental rationality (Romp 1997: 2-4; Sen 1977). Similarly, Norwegian-Russian petroleum relations in the High North can be likened to the folk theorem, central to any discussion on infinitely repeated games (Rasmusen 1989). The first condition of this game is that the time preference is zero, or positive and sufficiently small. The second is that the probability that the game ends at any repetition is zero, or positive and sufficiently small. This type of game supposes that if a game is infinitely repeated, many strategy combinations are in equilibrium. Given the proposition that players value future payoffs and believe that the game is continuous, many sets of moves made by any player will be in equilibrium. This indeterminacy is a significant feature of this game. Given this, many political scientists have argued the case that by infinitely repeating a game, the new equilibrium is mutual cooperation. Although mutual cooperation is a possible equilibrium, it is only one of many possible equilibria (Gates and Humes 1997: 93-94).

Games with multiple Nash equilibria

In any situation where there are multiple Nash equilibria, it is not always clear which one is the solution to the game. An outcome is a Nash equilibrium if no player can profit from unilaterally changing strategy so that the outcome becomes different. Thus, in a Nash equilibrium, each individual player has maximised his own payoff (Hermansson 1990: 107).
The folk theorem game, where players can engage in explicit pre-play negotiations, demonstrates how repetition can greatly increase the amount of self-enforcing agreements players are willing to adhere to. If players play the Prisoner's Dilemma game once and never meet again, no amount of pre-play negotiation will enable the players to cooperate. In order to cooperate, then, players need to be able to form a binding agreement that includes an enforcement mechanism, which exists outside the boundaries of the game described. However, if this situation is repeated, there are many self-enforcing agreements the players might come to. The existence of a Nash equilibrium gives a necessary condition for an obvious way to play the game, without prejudging the existence of an obvious way to play the game. Without pre-play communication, the players need to rely on convention, learned

behavior, or a focal point to make their move in situations of multiple equilibria (Kreps 1990: 512-513).

Equilibrium analysis presupposes that people have a lot of common knowledge. Common knowledge is information that all players know, and all players know that other players know and so on. A lack of such common knowledge would challenge the ability to conduct equilibrium analysis, as a player would not know what to expect from the other. In this way, effective signaling would be deemed impossible if the sender could not predict the effect of the signal on the receiving player (Morrow 1994: 307). Binmore (1991) differentiates between eductive and evolutive processes of equilibrium. Eductive processes, on the one hand, are based on reasoning. It is a logical process that involves reflection on what other players will do. An evolutive process, on the other hand, uses evolution in order to reach equilibrium. The problem is, nonetheless, that human rationality seems to fall somewhere between these two opposites and progressing towards a complete understanding will necessitate a scrutiny of both. Thankfully, game theory offers an important step towards fully understanding rationality in settings of a strategic nature (Morrow 1994: 311).

Realist assumptions present in games

Support for contingent realism can be found in the literature that desires to explore cooperation under anarchy. Cooperation theory provides insights that highlight the importance of each state's beliefs about the other player's preferences. Given this assumption, the state comparing the value of the agreement and the risks of being cheated faces four possible outcomes: the agreement prevails (CC); the competitor cheats (CD); mutual defection (DD); or, the state itself cheats, gaining an advantage in subsequent negotiations (DC). Unlike in a PD game, in a Stag Hunt (SH) game, a game that describes a conflict between safety and social cooperation, it can be individually rational for two states to cooperate. This is as there are two pure strategy Nash equilibria in this game; when both players cooperate and when both players defect. Cooperation is therefore not given if the states are unsure of one another's preference orderings. For instance, a state with Stag Hunt preferences believing that it faces a state with Prisoner's Dilemma preferences should defect (Glaser 1995: 81-82).

A state that is uncertain about the other player's preferences, should consider the magnitude of the differences between its payoffs. This is when the danger posed by cheating comes into play. The prospects for cooperation also depend on the states' preferences in the game. Cooperation should happen if the two states believe they are playing a SH game. However, cooperation can also be possible if the states believe they are playing PD game. This is because, given their strategy for dealing with defection, when repeated, the game can turn out to be a Stag Hunt game. Therefore, a way to change the game to a Stag Hunt game is by repeating the given PD game played under certain conditions (ibid, 82-83). Figure 7 below illustrates a normal form representation of the classic Stag Hunt game.

	Cooperate Stag	Defect Rabbit
Cooperate Stag	R = 5, R= 5 Reward for mutual cooperation	S = 0, T = 3 Sucker's payoff, and temptation to defect
Defect Rabbit	T = 3, S = 0 Temptation to defect and sucker's payoff	P = 3, P = 3 Punishment for mutual defection

Figure 7. The Stag Hunt Game

Given this gloomy picture, which variables ultimately dampen the impact of anarchy and the security dilemma in the international system? The workings of several can be seen in terms of the Stag Hunt or repeated plays of the Prisoner's Dilemma. The Prisoner's Dilemma differs from the Stag Hunt in that there is no solution that is in the best interest of all players. In this sense, there are offensive as well as defensive incentives to defect from cooperating with other players. If the game were to be played only once, the only rational thing to do would be to defect. However, if the game were to be repeated infinitely, this logic no longer applies. The game could then be analysed in a similar fashion to the Stag Hunt game. In this scenario, it would be in the interest of each player to deprive the other player of the power to defect.

This is because each player would be willing to sacrifice this ability if the other player was similarly restrained. If the other player was not restrained in this manner, however, then it would be in the interest of any player to retain the power to defect in the game (Jervis 1978: 167-171).

Figure 8 below illustrates how an extensive form version of the Stag Hunt game may be played out. The main difference between the extensive form version of the PD game outlined previously and the SH game outlined below is the change in the payoff structure. Unlike in the PD game, it could be deemed individually rational for states involved in a SH game to cooperate. However, as mentioned above, cooperation is not assured if the states are not aware of one another's preference orderings (Glaser 1995: 82).

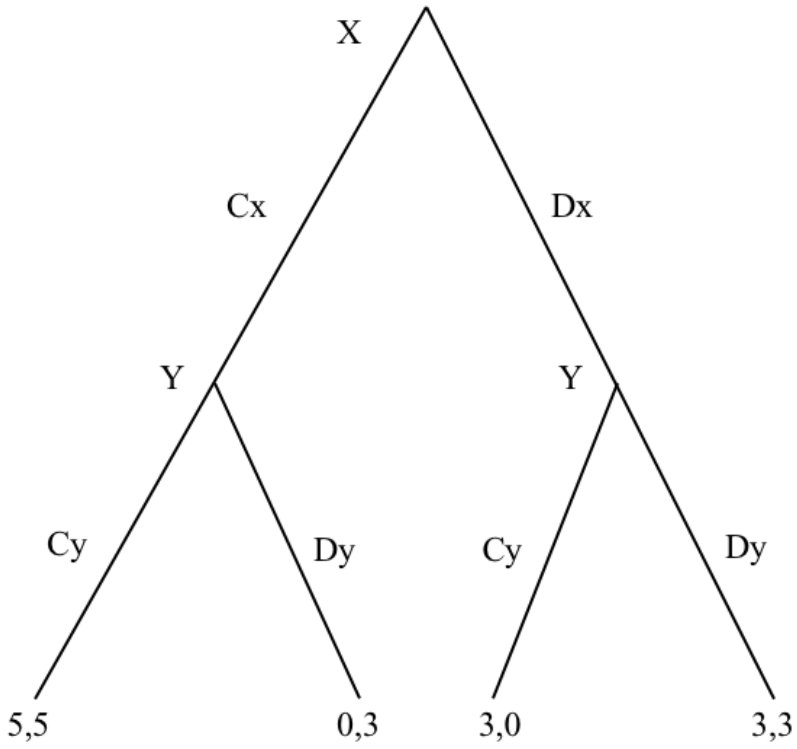

Figure 8. Extensive Form Representation of a Stag Hunt Game

While realism as a theory of international politics has generally ignored the decision-making level of analysis, game theory can incorporate the empirical findings in this area. To understand when cooperation happens, it is necessary to understand how different beliefs and

values can influence the states' evaluation of game outcomes. Further, it is important to be aware of whether self-interest is defined unenthusiastically or is driven by care for what happens to the other state. If the latter applies, the significant factors will lie outside the anarchy framework. Robert Keohane has pinpointed that cooperation may be explained partly by the fact that states can only use bounded rationality. State officials need to sustain their cognitive resources, and shared principles can therefore be enormously helpful in easing the burdens of prediction, coordination and choice. State officials do not automatically reciprocate cooperation or defection. Instead, their behavior is influenced by their analysis of what the other state did and why it did so. Most state behavior is ambiguous and so are the intentions underlying these actions. How states respond is therefore affected by their analysis as to whether the other state intended the outcome that was produced, the behavior is best explained by the situation the other was in, or by their personality. Besides, given the interactive nature of international politics, the understanding a state official has of the other state's actions is affected by how he thinks his own state is behaving toward the other state. In this way, state officials may think that they are cooperating when a neutral bystander would imply that they are, to a certain degree, defecting (Jervis 1988: 336-337).

Realism does, however, not imply endless conflict. The affinity between realism and neoliberal institutionalism is not the only reason to doubt the claim that realism has no place for cooperation. This view would imply that conflict of interest is total and that whatever one state gains, others must lose. This vision of a zero-sum world is implausible. The sense of international politics as characterized by constant bargaining, which is central to realism, implies a mixture of common and conflicting interests. More worthy of exploration is the less extreme view that realism sees world politics as much more conflictful than does neoliberal institutionalism (Jervis 1999: 44-46). To view international politics as a Hobbesian state of nature does not suggest that warfare is constant, but only that there is always a possibility for war and that states in the international system understand this. Even if the anticipation of conflict may serve to make it more likely, it can also push states to act to reduce the danger of conflicts occurring (Jervis 1998: 986).

Realism is known for arguing that power must be located in one place in order to reach the state's objectives. For realists, nevertheless, it is equally important that goals fit within the possibilities created by this arrangement of power. Realism also attempts to understand the conditions under which states are likely to cooperate and the strategies that states can use to

encourage cooperation. This line of reasoning is sometimes linked to neoliberalism, but the two are difficult to separate in this regard. Separating them would be easier if realism viewed conflict as zero-sum, and believed states to be on the Pareto frontier. This argument supports the view from neoclassical economics that all relations have progressed to be maximally efficient, but political relationships are often tragic because states are oftentimes unable to realise and take advantage of their mutual interests. Offensive realists see aggression and expansionism as omnipresent and stress the prevalence of extreme conflict of interest. Defensive realists, on the other hand, believe that much of international politics is a PD game or a more complex security dilemma. Therefore, the desire to gain intertwines with the need for protection. As a consequence, a lot of the work of state officials is concerned with structuring situations so that states can maximise their mutual interests (ibid). This line of reasoning can be seen in terms of the Delimitation Agreement, as Norway and Russia were able to realise their mutual interests and take advantage of them. This will be discussed further in the next chapter.

In this sense, morality and fairness concerns are almost always going to play a large part in the explanation for the fact that states cooperate much more in reality than the PD game scenario would have us to expect. Indeed, it is possible that morality is the sole way to reach many mutually cooperative outcomes. Partly due to the tendency of states to be self-righteous and view their own behavior as cooperative and that of other states as hostile, fear and temptation may yield mutually unwanted outcomes so long as narrow self-interest dictates behavior. However, at the very least, the feeling of being morally obligated to reciprocate cooperation and expect other states to act according to the same code of conduct, should allow for a wider range and scope for mutually beneficial outcome (Jervis 1988: 348).

Simply arguing that states are the central actors in the international system does not help us understand which interests they will pursue. While it may be the case that all states want a high measure of security, some states strive for other goals, which may lead to a disregard for their own security. Even if security is the main goal of states, this does not tell state officials, what behavior will ultimately secure this outcome (Jervis 1998: 982). Nonetheless, looking at the negotiations leading up to the Varangerfjord Agreement, the Grey Zone Agreement and the Delimitation Agreement will highlight, to some extent, what kind of behavior by state officials has secured cooperative Norwegian-Russian petroleum relations in the High North.

6 Agreements

This chapter will analyse the cooperative petroleum relationship between Norway and Russia in the High North by means of the Varangerfjord Agreement, the Grey Zone Agreement and the Delimitation Agreement. These agreements have been chosen because they build on each other from a time perspective and because, although they were intended to relax tensions between Norwegian and Russian fishing vessels operating in this area, these negotiations were influenced by both states' hope to explore and extract petroleum resources on the seabed of Arctic waters. This chapter will start off by explaining how negotiations can be viewed through the lens of game theory and then proceed to discuss the three agreements mentioned above in chronological order.

6.1 Negotiations from a game theoretical perspective

A negotiation can be said to take place when explicit proposals are unveiled in order to reach agreement on the realisation of a common interest where there are conflicting interests (Iklé 1964: 3-4). In this respect, it is worth noting that the higher the player's benefits from negotiations ending in war, the higher the likelihood that the dispute will actually end in war. On the other hand, if the dispute is settled short of war, the better is the negotiated settlement (Banks 1990: 612). Given that Norway and Russia have a lengthy history of relatively good neighbourly relations that they can draw on to support their efforts to settle border disputes, such negotiations are unlikely to end in conflict, and even less so, in war.

Scholars have argued that issues related to international cooperation all share a common structure. Therefore, such issues have often been evaluated by reference to simple matrix games, such as the Prisoner's Dilemma game or the Stag Hunt game outlined above (Fearon 1998: 269). Before an international agreement can be enforced, implemented and monitored, negotiations must take place to determine which of many possible agreements can be put in place. Framing the issue as a problem of bargaining, then enforcement, means that states may interact in ways that emphasise future payoffs rather than present ones. In this sense, states will have a greater incentive to bargain in order to secure a good deal. While this may serve to

limit cooperation in the present, this trade-off is struck to ensure more rewarding cooperation and better terms of agreement in the future (ibid, 296).

In this respect, orthodox economic theory tells us that most agreements tend to lie within a certain range, labelled the range of practicable bargains by Pigou, and this range is defined by two distinct properties. Firstly, they fall on the Edgeworth contract curve, which is the point where neither party's position can be improved without at the same time worsening the position of the other party. This point is also known as the point of Pareto optimality. The two limits, which can be labelled maximum-concession points, are the points where neither player would accept an agreement that put them in a worse position than not reaching an agreement. Put simply, each player's maximum-concession point is the point where the net gain resulting from the agreement would only favour the other player. What make negotiations difficult, then, is that current economic theory does not explain how the position of the actual agreement point is determined within this range of practicable bargains and how the division of the net gain is determined between the two negotiating parties (Harsanyi 1956: 144-145). However, evaluating the Varangerfjord Agreement, the Grey Zone Agreement and the Delimitation Agreement should help us understand some of reasoning behind why Norwegian-Russian petroleum relations have remained cooperative.

6.2 The Varangerfjord Agreement

The cooperative petroleum relationship between Norway and Russia in the High North can be said to have evolved in three different phases. In the first phase, beginning in 1957, these two states signed the Varangerfjord Agreement. This agreement defined the border between Norway and the then Soviet Union in the Varangerfjord, which lies in the southern part of the Barents Sea (Henriksen and Ulfstein 2011: 2). Negotiations on this boundary in the Varangerfjord, which were suggested by Norway in 1956 following the arrest of several Norwegian fishing vessels, started on the 14th of January 1957 and were concluded on the 15th of February 1957 (Elferink 1996b: 6). While this initial agreement is not often mentioned in the literature on the topic, it helped set the stage for discussions about the Barents Sea, where both states declared sovereignty over their respective continental shelves (Orttung and Wenger 2016: 89). All subsequent boundary negotiations and the concluding Barents Sea

Treaty, or Delimitation Agreement as it is also known, should therefore be viewed in the context of the starting point that was the Varangerfjord Agreement (Dahl 2015: 121).

The maritime boundary between Russia and Norway starts from their respective land borders in the Varangerfjord. While Russia borders the eastern part of the fjord, Norway borders the western side. In the Varangerfjord, the relevant delimitation coasts are somewhat adjacent and partly opposite to one another. In the Barents Sea, therefore, the first part of the boundary is affected by the adjacent mainland coasts, while the second part of the boundary is influenced by the opposite coasts of Norway's mainland territory, the Svalbard archipelago and the Russian archipelago of Novaya Zemlya. As a result, the boundary established by this agreement consists of two straight line parts, which each measure 12.6 miles and 11.8 miles respectively. The first part stretches from the end point of the land border to the intersection of the outer limits of the territorial seas of both states. In order to determine the exact point of this intersection, the territorial sea of the Soviet Union was measured from the low-water line, while the Norwegian territorial sea was measured from the Norwegian straight baseline in the Varangerfjord. The second part of the boundary stretches from the end point of the territorial sea boundary to the middle point of the closing line of the Varangerfjord. Thus, the boundary line in the Varangerfjord can be said to be favourable to Russia in comparison with an equidistance line giving full weight to the Norwegian straight baseline (Aasen 2010: 70-71; Elferink 1996b: 6-7).

Conceptual difficulty is created by the fact that in many encounters, like the negotiations between Norway and Russia in the Barents Sea, the main stake is power, which is an extremely difficult concept. However, in almost all instances, power in international politics is relative rather than absolute. Knowing how much leverage one state has over another does not tell state officials or observers very much unless they also know how much leverage the other state has. Thus, it can be rational for state officials to attempt to lessen the absolute level of payoffs they receive from any particular agreement. This view of how to approach negotiations is not only compatible with realism, but is embedded in it. Thus, as long as power is central, an element of conflict will be involved, and this will serve to complicate the attempts of state officials to cooperate and undercut some of the prescriptions deduced from the anarchy framework. In fact, Stein has demonstrated that the dilemma of the hegemon is present within the realm of economic concerns because a major state that only worries about absolute gains is more likely to be surpassed by other states in the long term (1984; Jervis

1988: 334-335). This line of reasoning can be observed in the negotiations leading up to the Grey Zone Agreement, as the interests of both Norway and the then Soviet Union became more clear at this time, and both states were careful not to push each other too far.

6.3 The Grey Zone Agreement

As mentioned above, the delimitation dispute in the Barents Sea dates back to the 1957 Varangerfjord Agreement, at the very least. This agreement served to establish the boundary between the territorial seas of mainland Norway and the Soviet Union (Henriksen and Ulfstein 2011: 2). The Grey Zone Agreement of 1978 between Norway and the Soviet Union, however, was meant to be a provisional arrangement, where the definitional properties of a negotiation were certainly present. Moreover, this agreement represented a politically contested settlement between two states with disproportional power capabilities, agreed upon during a tense stage of the Cold War, and heavily criticized in Norway for its alleged territorial concessions to the SU. The Grey Zone Agreement has its origins in a disagreement over the maritime border in the Barents Sea, as mentioned with regards to the Varangerfjord Agreement. This disagreement between these two states created a disputed area of 155,000 square kilometres between the two opposing delimitation lines (Stabrun 2009: 2).

During the 1970s, the existence of such a disputed area in the Barents Sea was a delicate issue for three key reasons. Firstly, the Barents Sea was of vital strategic importance to the security policies of both states. Taking into account this Cold War setting, any territorial concession in this area would have the potential to make for disastrous strategic consequences. Secondly, the Barents Sea was rich in living resources and therefore significant for economic reasons. Thirdly, the disputed area was believed to contain great oil and gas reserves, which made the issue of a final delimitation line highly sensitive to both states. Since the 1970s, Russia had claimed the border should be drawn directly through a line from the land border up to the North. Norway, on the other hand, had claimed that the border should lie midway between the Svalbard and Novaya Zemlya islands. From 1975 onwards, the delimitation dispute was highlighted by a radical transformation within the Law of the Sea. As a result of the negotiations at UNCLOS III, an international practice of EEZs stretching 200 nautical miles off maritime coasts was established. This newfound practice represented a massive judicial

leap, as similar maritime zones had previously been limited to a mere 12 nautical miles of territorial jurisdiction (ibid).

From a game theoretical standpoint, it is evident that only limited information on possible outcomes is available in some games. In the case of the Grey Zone Agreement, each of the two states, Norway and the Soviet Union, is a group of players combined rather than an individual. This adds no significant issues if each state behaves consistently and therefore can be said to have a utility function. The process of negotiation can therefore be observed as a two-state bargaining game, and for the sake of simplicity, it does not make a difference to the states how a specific dispute is settled. Even though the analyst observing this game is not able to establish every single possible agreement, at least four outcomes are likely to be present, and these are as follows:

A. No agreement.
B. The Norwegian draft treaty
C. The Soviet draft treaty
D. A compromise treaty in the upper right part of the region of feasible outcomes. An important property of this kind of treaty is that it cannot be rewritten without making it less satisfactory to at least one of the players.

Again, for the sake of simplicity, both states rank these outcomes in the order of their own draft being the most preferred, next the compromise treaty, then the other state's draft, and lastly, no agreement (Axelrod 1970: 82).

In so-called tug-of-war negotiations, which the Grey Zone Agreement can be said to represent, each state attempts to obtain the agreement that is the best possible alternative for them, in terms of their own preferences and interests as laid out above (Hovi 1998: 60). According to Axelrod's logic laid out above, this would be either option B or C, depending on whether one is looking at it from the perspective of Norway or the SU (Axelrod 1970: 82).

Overall, the conflict regarding zones in the Barents Sea centred on two major questions. First and foremost, Norway and the SU were unable to agree on maritime borders. On the whole, the Grey Zone Agreement was just a step in a long process that gradually made Norway's room for manoeuvre smaller. The Grey Zone was meant to be temporary but became gradually more permanent in nature given that Norwegian and Soviet authorities continued to disagree on border concerns in the Barents Sea. Norwegian authorities were early on in the

negotiations prepared to accept a draft agreement based on equally sharing the disputed area, but this was not made clear to the SU until later. However, no agreement was reached until the UNCLOS extension to 200 nautical miles happened in January 1977. At this time, it is possible that Moscow, even more so than Oslo, wanted a deal to be struck as it was probably more problematic for a great power to have an unresolved delimitation dispute than it was for Norway. However, the delimitation question remained unresolved until 1978, when the agreement was still considered provisional in nature (Tamnes 1997: 291-295).

The final agreement negotiated in 1977, signed in January 1978, and ratified by the Norwegian Parliament in March 1978, eventually provided an effective solution to the challenges related to resource management in the area. However, the agreed 'area of application' was not the disputed area, nor was it geographically balanced between the median line and the sector line. Instead, it was an 'adjacent area' considerably extended in the Western direction, so that, to a considerable extent, the geographical terms accommodated Soviet demands. In Oslo, the lack of territorial balance was seen by many in the political elite as a concession to Moscow. It was argued that the agreement would inevitably have a detrimental effect on the delimitation dispute in favor of the sector line, moving the Soviet sphere of influence significantly to the West. Furthermore, Norwegian acceptance of such unfavourable terms could end up jeopardising the credibility of Norwegian policy in the High North (Stabrun 2009: 1-5).

The Grey Zone Agreement covered a large part of the southern area of the disputed waters as well as undisputed Norwegian and Soviet EEZs. Under the agreement, each state was to exercise jurisdiction solely over fishing vessels flying its own flag and over vessels flying the flag of third states that had access to the area under license. Since its signing, the Grey Zone agreement was extended for 1-year periods, until the Delimitation Agreement was finally signed in 2010 (Henriksen and Ulfstein 2011: 2). The Grey Zone Agreement only intended to determine who were to supervise fishing in the above-mentioned area so that negotiations regarding the delimitation of the continental shelf in the Barents Sea could continue and eventually be finalised. However, it can be argued that this agreement indirectly concerned petroleum matters as it demonstrated that neither state was willing to push for unilateral action on the petroleum side. While the Soviets tended towards doing so early in the 1980s, later negotiations have underlined the importance of petroleum issues to both states. Figure 9

below exposes the properties of the Grey Zone Agreement, and Norway and the SU's respective EEZ limits. These new limits were the result of the negotiations at UNCLOS III.

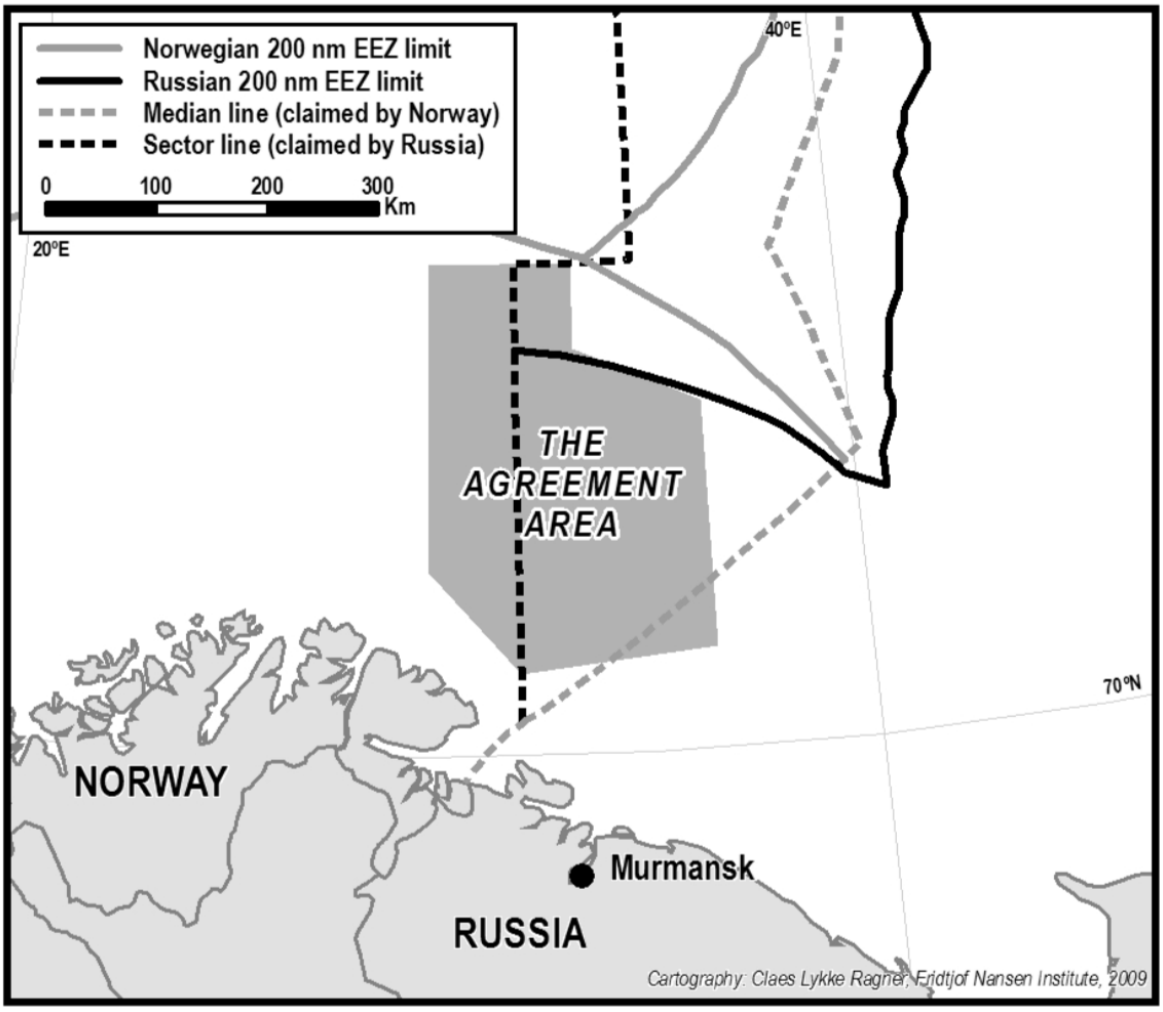

Figure 9. Map Illustrating the Process of the Grey Zone Agreement and the Two States' EEZ Limits (Stabrun 2009: 5).

During the negotiations and before the draft agreement was a reality, it was clear that geography, in the event of a conflict of interest between government objectives, should be given priority. The tension added to the bilateral relationship by Soviet missile tests and seismic surveys in the disputed area and its vicinity, served to highlight power asymmetries between the two states. How the Norwegian government perceived the dilemma and how they framed the decision, also proves the priority that was given to conflict avoidance. It seems

that the decision to a large extent was made in light of the 'disadvantages of non-acceptance'. Foreign policy advisors spoke of 'what we must avoid', instead of 'what we get'. Therefore, there was a marginal difference between this situation and a point where the sector line was the de facto delimitation line. As a result, when the government found itself in the situation where a draft agreement was on the table and further negotiations were considered unfeasible, the Grey Zone Agreement's ability to prevent the sector line from being the de facto delimitation line through creating a provisional, jurisdictional regime, together with the risk of conflict and instability in the absence of an agreement, were the decisive factors for the government's final decision (ibid, 29-35).

Referring to Axelrod's logic laid out above, it is clear that Norway wanted to avoid option A, known as no agreement. For both Norway and the Soviet Union, this would have been the worst possible outcome of the negotiations as both players ranked the possible outcomes in the order of their own draft being the most preferred, next the compromise treaty, then the other player's draft, and lastly, no agreement. Norway therefore had to make concessions to secure option D, a compromise treaty satisfying both states to a certain extent (Axelrod 1970: 82).

This outcome of the negotiations can be said to be Pareto-efficient, as none of the states involved could have been made better off without making the other state worse off (Romp 1997: 4). As the threat of punishment by the Soviets was sufficiently severe and appeared credible, the Norwegians were deterred from deviating (Dixit, Skeath, and Reiley 2015: 36). Thus, because Norway was the player under the most pressure during these negotiations, the compromise treaty ended up being more favourable to the Soviets. As a result, the political elite in Oslo was concerned with the lack of territorial balance inherent in the agreement and saw this compromise as a concession to Moscow (Stabrun 2009: 5).

All in all, the geographical imbalances of the Grey Zone Agreement clearly reflected the SU's power and negotiating strengths, even if the final grey zone laid further east than the Soviets initially thought. The Kremlin withdrew from the principle of the sector line, in which there was considerable prestige. While it was difficult to explain that Norwegian enforcement could not exercise fishery jurisdiction over Soviet fishers in the undisputed Norwegian area west of the sector line, it was equally awkward for the Soviet government to explain that they could not carry out inspections of Norwegian vessels in an area of close to 47 000 km squared that

the Soviet media and education system presented as indisputably Soviet (Kvalvik 2004: 67). Thus, while in Oslo the lack of territorial balance was seen by many in the political elite as a concession to Moscow, the final agreement was not entirely positive from a SU standpoint either (Stabrun 2009: 5).

6.4 The Delimitation Agreement

Encouraging good outcomes in games is not only about lecturing players that there is more to be had from mutual cooperation than mutual defection. It is also a way of altering the attributes shaping the interaction so that cooperation in the long run may become the norm (Axelrod 2006: 141). This can definitely be said to be the case for the Barents Sea Delimitation Agreement of 2010. However, to make sense of the Delimitation Agreement, it is necessary to consult the preceding negotiations and the Grey Zone Agreement.

The position held by Norway during the negotiations with the SU over the delimitation line in the Barents Sea was that a border should be laid out according to the median line principle. The SU, on the other hand, held that the sector line should be followed because of special circumstances. These opposing claims would leave a sizable disputed area of 155 000 kilometres squared, greater than the Norwegian shelf in the North Sea, unresolved. Norway had always been vocal that it would be willing to renegotiate and find a satisfying compromise. A 'unitization clause' was also proposed, outlining that any petroleum finds cutting across the border would be exploited by both states (Moe, Fjærtoft and Øverland 2011: 146).

However, the Soviet Union was not impressed or convinced by any proposal put forward by the Norwegian government. This unwillingness to budge was a long-standing refusal on the Soviet side to admit even the existence of a disputed area, and their solution to the border dispute was branded as the only possible solution. However, the negotiations were more of a tug-of-war than is often realised. When Chairman of the Soviet Council of Ministers Nikolai Ryzhkov visited Norway, for instance, he proposed the creation of a 'zone of cooperation and confidence' for joint resource exploration in the disputed territory. However, this zone would also cover undisputed territory. Norway could not accept such an arrangement given that joint

jurisdiction was the one clause that the Norwegian government had been wishing to avoid (Moe 1990: 135-136).

While a temporary agreement had been in place since 1978 regarding fisheries, it was only in 2010 that both countries finally solved their border dispute in the High North. To understand the magnitude of the agreement, it is necessary to keep in mind that it involved an area in the Barents Sea and the Arctic Ocean greater than the landmass of Ireland and Portugal combined. On the 15th of September 2010, Norway and Russia signed an agreement pertaining to the delimitation of an area the size of 175 000 square kilometres in the Barents Sea and in the Arctic (Jespersen and Vestergaard 2015: 142).

The explanation behind the timing of the 2010 agreement resolving the marine delimitation dispute between Norway and Russia in the Barents Sea needs to be found mainly on the Russian side. The willingness of Russia to compromise on the spatial disagreement at this exact time was not, as is commonly thought, driven by an ambition to extract petroleum resources in the previously disputed area. Rather it was the product of wider Russian foreign policy concerns. Such efforts included a general desire to decrease tensions and the risk of conflict with neighbouring states by resolving as many territorial disputes as possible, strengthening UNCLOS as the dominant framework for Arctic governance, and overall, improving Russia's image as a rule-abiding player internationally. The formerly disputed area is also strategically and economically significant as it is the gateway to Russia's only port that remains ice free all year in Murmansk, the entrance to the Northern Sea Route, and the shipping route for oil and liquefied natural gas (LNG) from the East Barents and Kara Seas (Moe, Fjærtoft and Øverland 2011: 145).

This delimitation dispute also served to impact Norwegian petroleum activities. In 1976, while the NPD were conducting seismic surveys in this area, the SU announced that the territory was a target area for missile testing, effectively signaling Norway to stop exploration. While neither seismic surveying nor missile testing are legally opposed to international law in open seas, the episode was not one characterized by mutual trust or cooperation (Moe 1990: 135-136).

However, while the potential for large-scale petroleum development highlights the stakes and the importance of achieving a settlement, it cannot sufficiently clarify why negotiations were

successful at this time. Similarly, the positive trend in bilateral relations and new standards within international law may explain part of the picture but may be said to have limited explanatory power in this case. Rather, it is likely that maturing negotiations, Russia's efforts to solve territorial disputes and the aspiration to be viewed as a rule-abiding international actor all aid in trying to explain why the dispute was settled precisely in 2010. Although no factor can fully justify the timing of this settlement, these factors must be considered in combination. Nevertheless, many explanations point to the aspiration to boost UNCLOS as the most important Arctic governance framework as having been a very significant motivation for the Russia. In the aftermath of the 2008 Ilulissat Declaration, this motivation cannot be said to be unique to Russia, but rather a coherent push by Arctic littoral states to falsify the myth of a so-called 'scramble' for the Arctic (Moe, Fjærtoft and Øverland 2011: 158).

What is clear, however, is that by virtue of their agreement, these two states have used a delimitation method that is similar to equitable principles. In fact, most disputes of this sort that have been settled between Arctic states show that there exist different ways of deciding the final delimitation terms. Most states are willing to employ the equal distance principle, but the decisive choice of delimitation method happens according to the surrounding circumstances, including the parties' respective negotiating positions. Thus, most Arctic states will use the equal distance principle, so long as no surrounding circumstances necessitate the use of a different delimitation method (Jespersen and Vestergaard 2015: 142). Again, referring to Axelrod's logic employed above, it is apparent that the Delimitation Agreement constitutes a version of option D, namely a compromise treaty (Axelrod 1970: 82). This is as both players were willing to settle for a delimitation line known for its equal payoffs to both negotiating states.

This settlement could be characterised as a Nash equilibrium point. This is because both Norway and Russia have maximised their own payoff at this point (Binmore 2007; Hermansson 1990: 107). As such, none of them could have achieved a better payoff by switching to some other strategy that was available to them while the other state adhered to the strategies specified to them. This understanding ensured that both players recognised that these strategies were best replies to the situation at hand. However, these negotiations may also have been a case of rational learning by way of repeated games. If so, both states involved started off with hypotheses about which strategies the other state might employ. The other state then responded with their best replies and given this gradual understanding, both

states updated their strategies as they observed the actions of the other state in the game. In this way, both Norway and Russia eventually learned to play this Barents Sea delimitation dispute game, one move at a time, and therefore ended up resolving the dispute in 2010 (Morrow 1994: 305-306).

A unique feature of these delimitation negotiations between Norway and Russia was that they occurred between a superpower and a relatively small state, which one must assume influenced the negotiations. Katzenstein explains that small states are considered small mainly because of their economic vulnerability, and that their political strategies therefore differ compared to large states (2003: 11-12). However, it is worth questioning whether Norway should in fact be considered a small state in this region, given its strong Arctic maritime power and presence (Wegge 2013: 76). Furthermore, Norway's negotiating rival experienced a regime change during the process of negotiating these three agreements, becoming Russia instead of the Soviet Union. Nonetheless, scholars have argued that this regime change ended up barely having an effect on the structural imbalance between these two states, as Russia still maintained its military interests and frameworks with regards to the High North. Thus, in order to understand if, and how, the asymmetry in power influenced the course and output of the negotiations, it is necessary to differentiate between each state's position as an international actor, and the power relationship between the two states in the given bilateral negotiations (Kvalvik 2004: 59; Rottem, Jensen and Hønneland 2008).

To better understand the relationship between Russia and Norway in these negotiations, it could be worthwhile to mention Russia's relationship with Sweden during the same time period. It has been argued that the changes in Soviet foreign policy that occurred under the instruction of Mikhail Gorbachev were instrumental in bringing about a settlement of the delimitation dispute with Sweden. However, this change can only partly explain why a compromise was reached. This is because the Soviet Union did not make comparable initiatives towards Norway over their delimitation dispute in the Barents Sea. One important difference between the two disputes, and the respective bilateral relationships, however, was the fisheries regime. While a Norwegian-Soviet provisional arrangement in the Barents Sea operated successfully, overfishing was an issue in the disputed area in the Baltic Sea, and the wish to regulate fisheries therefore contributed to the conclusion of a delimitation agreement between the SU and Sweden (Elferink 1996a: 555).

Today, there are a number of explanations for why Russia decided to settle the delimitation dispute in the Barents Sea at this exact time. Firstly, the evolution of international law changed the premises for negotiations. Secondly, improvements in bilateral relations between Norway and Russia made a settlement possible. Thirdly, the ambition to extract oil and gas in the disputed area was a major driver. Fourthly, the cost of unresolved border disputes was rising for Russia, and the agreement with Norway represents a general effort to solve as many such negotiations as possible. Fifthly, Russia wanted to be observed as a constructive international actor, and finally, Russia wanted to put UNCLOS forward as the framework for Arctic governance so as to halt the involvement of non-littoral states in the region (Moe, Fjærtoft and Øverland 2011: 148-158).

On the whole, the settlement of this delimitation dispute came as a surprise to both experts and the public as no leaks had surfaced from the negotiations. Within the NMFA, only a few senior staff who were directly involved in the negotiations knew that an agreement would come about. The Russian government had been equally secretive. In effect, the final treaty divides the formerly disputed area into two close to equal sides. Apart from outlining the maritime boundary, the treaty also underlines the terms associated with the development of oil or gas fields spanning the new boundary. More generally, it encourages more cooperation between the two states in this region (ibid, 145-146). To illustrate, figure 10 below demonstrates the properties of the Delimitation Agreement and highlights the location of different petroleum discoveries in the Barents Sea.

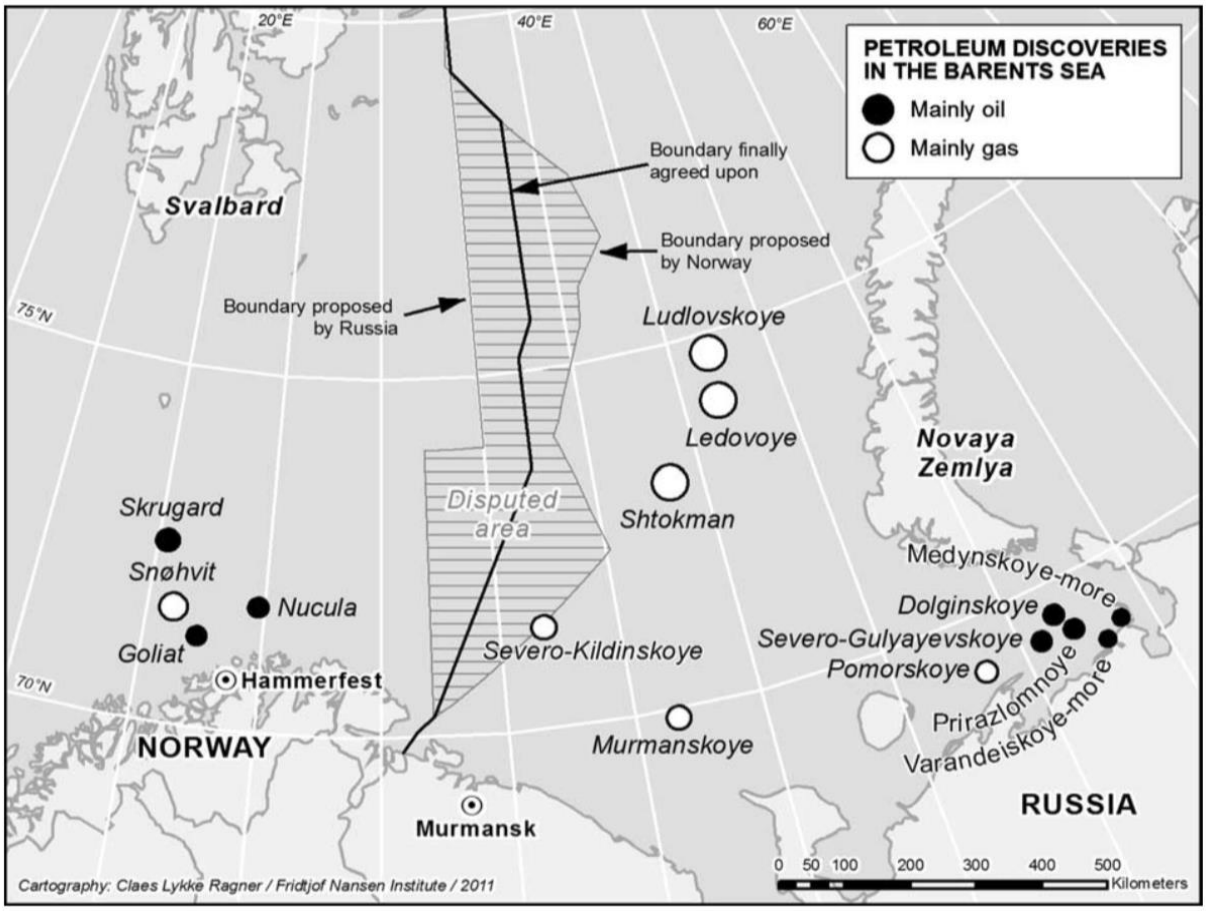

Figure 10. Map Illustrating the Process of the Delimitation Agreement and Petroleum Discoveries in the Barents Sea (ibid, 146).

While the reasons behind the treaty are many, the treaty is a significant step for both Norway and Russia. As mentioned above, the success of the negotiations can be attributed to a number of factors. Firstly, the existence of the international regulatory framework UNCLOS helped make the agreement come about. The principles of this framework seem to have helped the negotiations and informed the final delimitation decision. While the intricate details of the situation that eventually persuaded Norway to accept a moderate westward deviation from the median line in favour of Russia's sector claim are unknown, the solution achieved does not deviate much from an equidistance line (Jensen 2011: 157).

In this respect, the location of the delimitation line is justified from an international law perspective and in relation to comparable cases. To illustrate, the International Court of Justice has oftentimes used the median line as a starting point, subsequently changing the

final boundary to fit the relevant circumstances of the agreement in question. In the case of this boundary dispute between Russia and Norway, it is believed that Russian arguments for the westward shift of the delimitation line could have pinpointed important differences in the length of the two states' coastlines (ibid, 157-158).

Secondly, foreign policy changes seems to have provided for much of the driving force during the negotiations. This is as bilateral border solutions, including those concerned with functional zones at sea, are achieved due to the fact that both states are willing to make concessions. In the case in question, Russia and Norway ended up at a compromise which respects, to a certain extent, both countries original positions. As the UNCLOS stands today, it only encourages states to sit down together and discuss lines of delimitation that are acceptable to them both. Fortunately for the two states involved in this case, both Norway and Russia are currently examples of stable foreign policy actors with good bilateral ties that are able to merge their respective interests and achieve long-term solutions that both states can be pleased with. The Russia of the 1990s, on the other hand, represents a completely different story (ibid).

Additionally, there were economic reasons why these two states had been eager to agree on a boundary in this region. This is because an agreed maritime border allows states to put into place domestic legislation tied to international law, for instance in relation to the oil and gas industry. This goes not only for the previously disputed area, but for the Barents Sea as a whole. Finally, the mutual trust between these two states is paramount to the successful outcome of these negotiations. Overall, bilateral relations between Russia and Norway in recent years have been characterised as respectful, and there has been a definitive willingness between the two states to reach a satisfactory solution (ibid; Rowe and Hønneland 2010).

As a result, there are several reasons why Norway and Russia ultimately managed to settle their delimitation dispute. Game theory and realism can help shed light on some of these reasons. Similarly, there are several reasons why Norwegian-Russian petroleum relations in the High North have remained cooperative. The reasons for this cooperative relationship will be discussed further in the final chapter of this thesis.

7 Discussion and conclusion

The research question considered in this thesis is the following: *Why have Norwegian-Russian petroleum relations in the High North remained cooperative?*

This final chapter will start by discussing the main findings of this thesis by way of the two hypotheses analysed in relation to the agreements presented. Further, this chapter will analyse which hypothesis is best at explaining petroleum cooperation between Norway and Russia in the High North, and highlight the implications of these findings. This chapter will then evaluate potential other variables that could have been hypothesised to explain this bilateral relationship. After, suggestions will be given for further research relevant to the research question. This chapter will then highlight how, if attempted again, this thesis formulation could have been executed differently. This final chapter will end by providing concluding remarks.

7.1 Main findings

This thesis has considered two hypotheses in order to explain why Norwegian-Russian petroleum relations in the High North have remained cooperative. These hypotheses focus on mutual interests in the region and the possibility of benefitting from the others' petroleum resources and expertise, respectively. In light of the findings from the agreements presented in the previous chapter, it is worth discussing which of the hypotheses evaluated in chapters 4 and 5 can best explain the cooperative petroleum relations between Norway and Russia in the High North.

The outcome of any negotiation may range between total disagreement and complete agreement, with different degrees of ambiguity in the final settlement. Furthermore, there are several side-effects of the process leading to the settlement that has nothing to do with the agreement between the two players, but rather deal with third parties, international publicity, and so on (Iklé 1964: 59). Had I attempted to combine all these heterogeneous effects, the negotiating process would have seamlessly intertwined with the field of international relations. However, such an approach is not possible. It is therefore essential to focus only on

the question of why the particular negotiation process lead to the agreement under investigation. Following this method, I find that a combination of mutual interests in the region and petroleum interdependence help make the Norwegian-Russian petroleum relationship in the High North cooperative.

The signing of the Delimitation Agreement marked the end of a long stretch of negotiations. The process began in 1957 with the Varangerfjord Agreement, and the final Delimitation Agreement is considered a treaty of major significance to both Norway and Russia. The principles of the UNCLOS framework seem to have substantially aided the negotiations and informed the final delimitation decision. However, Norway was eventually persuaded to accept a moderate westward deviation from the median line in favour of Russia's sector claim. While the reasons behind the acceptance of this deviation by the Norwegians are unknown, the end result does not deviate much from an equidistance line. In this respect, the location of the delimitation line is justified from an international law perspective and in relation to comparable cases. In relation to this boundary dispute between Russia and Norway, it is believed that Russian arguments for the westward shift of the delimitation line could have pinpointed important differences in the length of the two states' coastlines (Jensen 2011: 157-158).

In so-called tug-of-war negotiations, each player attempts to obtain the agreement that is the best possible alternative for them, in terms of their own preferences and interests (Hovi 1998: 60). According to Axelrod's logic, it is evident that the Delimitation Agreement constitutes a version of option D, namely a compromise treaty. An important property of this kind of agreement is that it cannot be rewritten without making it less satisfactory to at least one of the players (Axelrod 1970: 82). Furthermore, foreign policy changes seem to have provided for much of the driving force during the negotiations leading up to the Delimitation Agreement. In terms of the agreement in question, Russia and Norway ended up at a compromise which respects, to a certain extent, both countries original positions (Jensen 2011: 158).

As the UNCLOS stands today, it only encourages states to sit down together and discuss lines of delimitation that are acceptable to them both. Fortunately for the two states involved, both Norway and Russia are currently examples of stable foreign policy actors with good bilateral ties that are able to merge their respective interests and achieve long-term solutions that both

states can be pleased with. The Russia of the 1990s, on the other hand, represents a completely different story. Additionally, there are economic reasons why these two states were eager to agree on a boundary in 2010. Having an agreed maritime border put in place allows states to develop domestic legislation tied to international law, for instance in relation to the oil and gas industry. Finally, the mutual trust between these two states is important. Bilateral relations between Russia and Norway have in recent years been characterised as respectful, and there has been a definitive willingness between the two to reach a satisfactory solution (Moe, Fjærtoft and Øverland 2011; Rowe and Hønneland 2010).

While the Russian rhetoric had been explicitly anti-Western for a while, there had also been conflicts of interest between Norway and Russia. The largest petroleum reserves in the High North still appear to be on the Russian side, and it would not be foolish to assume that one of the main objectives of the Norwegian High North strategy is to participate in the extraction of these. While individual projects in Norwegian foreign and security policy associated with Russia may have failed to some extent, bilateral relations more generally have prospered. Not only does this limit the prospect of conflict, but it may also help facilitate better resource exploitation in the Barents Sea, for both states (Hønneland and Rowe 2010a: 12-14). While clearly biased against Moscow and imposing sanctions, the Norwegian government has also emphasised the need for good neighbourly relations with Russia. This duality is testament to a long-standing tradition of balancing opposing elements in Norwegian policy towards Russia (Rowe 2018: 1).

The lack of an international sovereign in the High North not only increases the theoretical likelihood for a war to take place, but also makes it difficult for states that are satisfied with the status quo to arrive at goals that they recognize as being in their common interest (Jervis 1978: 167). To attempt to resolve this tendency to defect on issues pertaining to international relations, leadership situations in what would otherwise be known as Prisoner's Dilemma games are common, and can be said to apply here. The role of leader often falls to the most well-established or largest of the players, in this case Russia (Dixit, Skeath and Reiley 2015: 394). In such circumstances, the largest player may accept the leadership role since its own interests are closely tied with the other player. Further, if the largest player constitutes a substantial fraction of the issue or region, such a convergence of interests would seem obvious. In such a scenario, the largest player would be expected to behave more cooperatively than might otherwise be the case (ibid). This is what Russia has done and

continues to do. The willingness of Russia to compromise on the border disagreement in 2010 was ultimately driven by a desire to decrease tensions and the risk of conflict with neighbouring states by resolving as many territorial disputes as possible, strengthening UNCLOS as the dominant framework for Arctic governance, and overall, improving its image as a rule-abiding player internationally (Moe, Fjærtoft and Øverland 2011: 145; Roberts 2015: 116). By doing so, Russia helped counter its, and other states', realist urge to capture territory and concern with relative-gains in the international system (Krasner 1992).

In a nutshell, the game theory literature on repeated games explains that the possibility of cooperation depends largely on three criteria. These include how patient players are, the actual magnitude of the payoff that players obtain from the various possible outcomes, and the length of the game (Glaser 1995: 82). Bó and Fréchette, however, find that there is no clear evidence that factors such as patience or altruism have a systematic impact on the tendency to cooperate in infinitely repeated games. Instead, the evidence suggests that the key reason for cooperative behavior is strategic (2018: 88). Axelrod, in this respect, demonstrates that the strategy known as tit-for-tat works quite well when there is a 1% error rate in the identification of the other state's behavior. Nonetheless, this figure is drastically lower than that which can be expected in political interactions. George Downs and his colleagues have demonstrated that when the error rate is higher, this strategy is not likely to yield stable cooperation. Strategies that are not conditional on what the other state does, and that do not entail immediate reciprocation, may produce a change in the other state's attitudes, and may, as a result, be more effective than conventional analyses would suggest. As such, strict reciprocity may result in worse outcomes than initially expected. Cooperation is therefore more likely to come about when a state is willing to tolerate a higher level of perceived defection by the other state. Such a strategy, however, also increases the probability that the other state will, in fact, cheat (Jervis 1988: 339).

Similarly, the discussion of the cooperation problem initiated by Mancur Olson in the mid-1960s has resulted in a fruitful development of rationalistic theories. The basis for Olson's reasoning was that the emergence of cooperation in situations similar to that of the Prisoner's Dilemma could not be explained unless the analysis involved factors of an irrational nature. A conventional Prisoner's Dilemma game, therefore, has no other solution than the suboptimal equilibrium that results from all players acting in a manner that is considered individually rational (Hermansson 1990: 169). Therefore, it would be appropriate to imply that the game

between Norway and Russia in the High North is more like a more like a partnership game than a zero-sum game, because of their respective utility functions (Shubik 1973). The theory of utility provided by Von Neumann and Morgenstern (1947) is always consistent with the assumption that a state will maximise the mathematical expectation of their utility (Bishop 1963: 560). Thus, if a state prefers A to B and B to C, then that same state will also always prefer A to C (Axelrod 1967: 88-89). Therefore, according to Axelrod's logic, it is evident that the Delimitation Agreement constitutes a version of option D, namely a compromise treaty, and the fact that Norway and Russia were willing to settle their delimitation dispute in this fashion tell us a lot about their respective preference orderings (1970: 82).

The basic orientation of game theoretic modelling is toward the development of general explanations. However, like other social science models, game theoretic models do not try to address all complexities inherent in social interactions. The value of these models is rather derived for developing elegant explanations. For game theory this means narrowing down the context of a social interaction. Only the relevant players and moves are evaluated, but additional assumptions may be evaluated as the sophistication of the model increases (Gates and Humes 1997: 7-8). In this way, it has been worth using a game theoretic analysis to study why Norwegian-Russian petroleum relations in the High North have remained cooperative, by focusing the analysis on just these two states and limiting the strategic set of outcomes available to them in the agreements evaluated.

The game theoretical analysis employed by this thesis has, with this reasoning in mind, informed that the bilateral petroleum relationship between Norway and Russia in the High North is most similar in nature to the Stag Hunt game. This is because conventional representations of Prisoner's Dilemma games depict neither the realist specification of the relative-gains element of the structure of state preferences in mixed-interest situations nor the realist identification of the constraining effects of this element on international cooperation (Grieco 1988b: 620). This problem specifies that a state will join, leave or limit its commitment to any cooperative agreement if it suspects that a partner is achieving, or will likely achieve disproportionate gains because of their common venture. The assumption inherent in this scenario must therefore be that the two states achieve similar payoffs or believe they do so. However, the completely opposite assumption could also be true, as players believe both of these outcomes to be highly unequal. Such a view of the PD game by

states may be because states do not know, or do not scrutinise, the magnitude of the other state's payoffs or interval ranges (ibid, 603).

According to realism, issues of international politics must remain PD games, but they can sometimes be altered so that they are more benign in nature. This can be done by changing the payoffs to encourage cooperation, for example by increasing the transparency that allows each state to see what the other state is doing and understand why it is doing it (Jervis 1998: 987). From a realist point of view, a state will be highly dissatisfied if its partner's payoff from a game, or payoff-range, outstrips its own, and this changing of the PD game to liken a SH game is therefore necessary to facilitate cooperation (Grieco 1988b: 603). The knowledge that even if the other state in the game is benign today, it may become hostile in the future due to a change in circumstances, may equally force state officials to create arrangements that bind themselves and their partners. In this sense, the binding agreements between Norway and Russia in the High North relating to the Barents Sea can be explained by defensive realism. Realism, however, cannot explain why deeper forms of cooperation, such as that explored between Norway and Russia in the High North, exist between states and this is problematic for the explanatory power of realism in this case (Jervis 1998: 987).

Unlike in a PD game, it can be individually rational for two countries to cooperate in a SH game. This is as there are two pure strategy Nash equilibria in this game; when both players cooperate and when both players defect. Cooperation is therefore not given if the states are unsure of one another's preference orderings. A state that is uncertain about the other player's preferences, should therefore consider the magnitude of the differences between its payoffs. The prospects for cooperation also depend on the states' preferences in the game. Cooperation should occur if the two states in question believe they are playing a SH game, and there is not much of a conflict of interest (Glaser 1995: 81-83). The existence of a Nash equilibrium gives a necessary condition for an obvious way to play the game, without prejudging the existence of an obvious way to play the game (Kreps 1990: 512-513). The Delimitation Agreement reached between Norway and Russia can therefore be considered a Nash equilibrium, or a Pareto optimal outcome, as both states reached a settlement by which neither state's position could have been improved without at the same time worsening the position of the other state (Harsanyi 1956: 144-145; Ordeshook 1986: 207).

However, this cooperative petroleum relationship between Norway and Russia in the High North may also be characterised as cooperative game theory, because of its communication aspect, rather than non-cooperative game theory, which is the strand of game theory that has been evaluated throughout this thesis. Nonetheless, bilateral relationships have throughout the scholarly literature in both political science and economics been characterised by the assumptions inherent within non-cooperative game theory. Furthermore, by employing game theoretical reasoning to these two hypotheses and the cases outlined above, it is evident that Norwegian-Russian petroleum relations in the High North have remained cooperative because of both mutual interests in the region and petroleum interdependence. Nonetheless, it is fair to say that the petroleum interdependence aspect, in light of the cases and the game theoretical analysis employed, is the one that has probably facilitated and pushed cooperation between these two states the most. This could also be because this hypothesis is more specific and therefore easier to evaluate the impact of than the former.

In the spirit of game theory, it is worth stating that any model advocating human rationality as one of its fundamental principles is unrealistic. People are different, and some people are better problem-solvers than others. This applies to any setting, even between the individuals present at the negotiating table during efforts to settle the boundary dispute in the Barents Sea between Norway and Russia. Attempts to model differences human rationality in a meaningful way are therefore probably impossible. If it were possible, however, any study of political phenomena would be generalising through its underappreciation for differences in the human psychology (Helland 2002: 49).

7.2 Implications of the main findings

The goal of qualitative analyses is to reach a holistic understanding of specific circumstances or to develop theories and hypotheses about particular societal correlations. If the circumstances or correlations specified in the research question are more comprehensive than those included in the empirical analysis, the research is likely to suffer from generalisation (Grønmo 2011: 245). Given this, my conclusions can only be said to apply to Norwegian-Russian petroleum relations in the High North, and not any other bilateral relationship of either a similar or a different nature.

The main findings of this analysis may be summarised as follows. Of the two hypotheses discussed in this thesis, it is clear that neither of them can single-handedly explain why Norwegian-Russian petroleum relations in the High North have remained cooperative. That said, there are clearly mutual interests between Norway and Russia in this region, regardless of their asymmetries. The two countries share the Barents Sea, they are both interested in petroleum exploration and development in these waters, and desire to engage in sustainable resource management. Although the degree of cooperation between these two states depend heavily on the willingness to cooperate with one another, on both sides, other contextual factors also play a significant part. While few expect Russia's relationship with Norway to be of the more troublesome kind, there is still a considerable range within which it can fluctuate (Bourmistrov et al. 2015: 20). As a result, this hypothesis is not fully able to explain why Norwegian-Russian petroleum relations in the High North have remained cooperative. However, if applying Axelrod's conflict of interest insights, it appears as though the cooperative petroleum relationship between Norway and Russia in the High North lies close to a position of a minimum conflict of interest, represented by figure 6 (1970: 84). This figure demonstrates that the smaller the area to the right of point D, the more compatible the objectives of the states in the game are (Axelrod 1967: 92).

Developing offshore Arctic petroleum reserves require a significant amount of resources and advanced technology. The latter is something that Russian state-controlled giants Gazprom and Rosneft currently lack. Nonetheless, delimitation of the marine space and the seabed in the Barents Sea is a step in the right direction for Moscow's intention to start developing the resources under the Arctic seabed. As Kremlin politicians have uttered repeatedly, the transformation of the Arctic region into a resource base for the Russian economy is a strategic priority for the state. In this respect, Russia's Arctic Strategy of 2013 is more open than previous versions to cooperating internationally to solve some of the key issues faced by Russia's energy sector, namely the lack of technology and practical experience in exploiting petroleum fields in the region. In fact, the document plainly states that Russia on its own neither has the resources nor the technology to exploit petroleum fields in offshore parts of the Arctic (Choi 2014: 70; Zysk and Titley 2015: 320).

Furthermore, it is no secret that both Norway and Russia are attempting to move petroleum activities into the Barents Sea. Norwegian developments have been characterized by an industry eager to participate, but also wary of adverse commercial conditions. As regards

Russian developments, private and foreign interests are kept at bay. Currently, Norwegian production takes place in the North Sea for the most part, where oil output is falling. In future, production will increasingly be focused on the northern part of the continental shelf, namely the Barents Sea. As output from existing gas fields in the south start declining, extending the pipeline network northwards is a possible option in order to fill free capacity in North Sea pipelines with Barents Sea gas (Moe 2010: 225-226).

The resource pictures in Norway and Russia also differ greatly. While Russia has several unexplored areas, Norway's options are more limited, a fact that has become increasingly evident after the year 2000. The Norwegian petroleum industry has strongly advocated for increased activity in the North. On the Russian side, however, companies have been more hesitant. Although Norway seeks to cooperate with Russia to increase petroleum activity in the region, Norway is also a natural gas supplier to the EU, and therefore viewed by Russia as a competitor (Baev 2012; Baran 2007). Despite these complexities, both Norwegian and Russian regional interests have generally been positive towards development, but regional concerns are greater in Norway. In Norway, environmental considerations have worked to slow down developments. Contrastingly, environmental constraints have so far not played any noticeable role in Russian developments (Moe 2010: 244-247). As a result, this hypothesis is not fully able to explain why Norwegian-Russian petroleum relations in the High North have remained cooperative, but holds more explanatory power than H_1.

If I were to start over with this thesis formulation, there are a number of things I would have done differently. Firstly, I would have picked more concise and tangible variables to consider in my hypotheses. One option would have been to focus on a regional organ, such as the Arctic Council, the Barents Council, or even the European Union, and ask to what extent Norway and Russia cooperate on petroleum matters because of either of these institutions being in place. Another option would have been to adopt a more legal approach by asking to what extent Norway and Russia cooperate on petroleum matters in the High North due to UNCLOS (Carlson 2013; Jespersen and Vestergaard 2015).

Secondly, in light of my findings, it could have been more helpful to use a method other than game theory. Examples from previous scholarly literature include case study analyses and discourse analyses (George and Bennett 2005; Jensen 2010; Kratochvil and Tichy 2013). Similarly, my analysis may have benefitted from employing a different IR theory, such as

neoliberalism or post-structuralism to attempt to explain the reasons behind the cooperative petroleum relationship between Norway and Russia in the High North (Jensen 2012; Jervis 1999).

However, to defend the path taken during the writing of this thesis, it is worth stating that the choices made were thought out and decided upon for several reasons. First and foremost, the emphasis on the chosen variables reflect their standing in the wider literature on the topic. This is as these variables were mentioned time and again throughout my literature search. Had I chosen to focus my research, for instance, on the extent to which a regional organ or a legal framework has helped make Norwegian-Russian petroleum relations in the High North cooperative, the answer would likely have been inconclusive. This is because measuring influence or correlation in qualitative research endeavours is extremely difficult (Gerring 2012).

Furthermore, the use of game theory in this thesis derived not only from a desire to link this method with the topic at hand, but also because several works encountered during the thesis formulation used this method for similar political puzzles (Bishop 1963; Brams 1985; Fearon 1998; Hermansson 1990). Using game theory as my method meant that employing realism as the foundation for my IR theory was a good fit (Grieco 1988; Jervis 1988). In this respect, it can also be argued that defensive realism fits quite well with the bilateral relationship at hand (Jervis 1999: 49). Finally, the use of game theory facilitated a scrutiny of the negotiating process between Norway and Russia in the High North based on the agreements selected. This is as bargaining situations are often discussed in the wider game theory literature (Banks 1990; Harsanyi 1956 and 1962; Hovi 1998).

7.3 Suggestions for further research

In light of the preceding part of this thesis formulation, it is clear that much remains unresolved as to why Norwegian-Russian petroleum relations in the High North have remained cooperative. Given that none of the hypotheses evaluated in this thesis can fully explain this cooperative relationship, it is worth asking if other factors, that may have been more successful in answering the research question, could have been employed.

In the literature on this topic, there are a variety of other variables that could have been incorporated into this thesis to attempt to explain this bilateral relationship. Scholars have previously highlighted the importance of factors such as wider regional cooperation through the Arctic Council and the Barents Council, and the fact that very little petroleum exploration has presently taken place in the Arctic due to a low oil price and challenging operating conditions. Similarly, Norway's role as an information provider, for instance to the EU, in being a bridge to Russia, has effectively granted it a status outside the traditional great power/small state hierarchy of international relations. This, in turn, appears to give Norway a significant amount of influence in the EU, but also in the AC. This positive and intense bilateral relationship grants Norway added authority and a special status in Arctic relations as it offers other states an opening to Russian decision-makers (Rowe 2014: 77-78). In light of this, it would be worth investigating how Norway's relationship with the EU affects its relationship with Russia in the High North, and how much of a saying the EU has in Norway's dealings with Russia in this region.

Keeping the Arctic Council in mind, it is clear that Russia's position in the Arctic has been aided by the presence of this group of countries and their cooperation. While the Norwegian-Russian relationship will never be completely independent of the wider Russian-Western relationship, it is neither completely reliant on it. If conflicts were to occur, it is likely that states other than Norway would be at the forefront of Western disputes with Russia (Bourmistrov et al. 2015: 20). In this sense, the AC has helped give Russia a legitimate forum where it can communicate with Norway in a constructive manner. As the role of the AC in the negotiations discussed above and in wider Arctic matters has not been adequately evaluated in this thesis, it requires more scrutiny.

Since Russia saw the 2010 Delimitation Agreement as a way to decrease the influence of NATO in the Arctic, this agreement also helped Russia reduce the urgency of one of its main perceived threats to its security. Thus, although Norway is an important ally in the Arctic, Russia also views Norway as a NATO member part of a broader Western military alliance. This dualism makes Norway both more threatening and a potentially more useful partner (Orttung and Wenger 2016: 88). It could therefore be worth researching this dualism further and asking how this plays into the relationship between Norway and Russia in the High North more widely. Similarly, Norway being a NATO member may also serve to make the petroleum relationship between Norway and Russia in the High North more problematic, but

this line of reasoning is far from certain. Thus, it would also be worth researching how being a NATO member affects Norway's relationship with Russia, particularly regarding matters pertaining to the High North.

Some scholars have also pinpointed that focusing on the petroleum industry is a step backwards. Instead, it has been suggested that Norwegian-Russian petroleum cooperation in the High North today is rather the result of wanting to develop more environmentally friendly solutions to explore and extract petroleum resources in this region. That being said, the High North has not been this high on Norway's foreign policy agenda since the Cold War. It can be argued that this is due to the opportunities and challenges of the area as a future petroleum province. Before the collapse of the Soviet Union, feeble attempts were made to bring about various Norwegian-Soviet cooperation projects in the petroleum sector. However, it soon became apparent that developing oil fields in the Barents Sea was further down the agenda in Moscow than was the case in Oslo, although Soviet exploration in this area had produced several interesting finds (Gottemoeller and Tamnes 2008: 76; Holtsmark 2015: 582-3). Nonetheless, while the oil price fell dramatically mid-2014, it has recently recovered, and this helps put research questions on petroleum matters in the High North back into the spotlight.

Finally, cooperation in repeated games may be due to properties of the game itself, such as differences in payoffs and the prospect of continuation. However, the likelihood of cooperation may also be affected by circumstances that occur outside of the game. The literature on repeated games has previously investigated the effect of differences in personal characteristics, but this has reaped no robust correlation with behavior in games. The effect of personal characteristics in determining the outcome of repeated games therefore demands more attention. The process by which players learn to play Nash equilibrium is neither fully understood and requires further scrutiny. Similarly, the effect of history; the experiences players had before entering the repeated game in question, should be considered more closely as these may serve to alter the outcome of the game. Researching the effect of history on Russia, for instance, would make an interesting addition to the scholarly literature on petroleum relations in the High North and what makes them cooperative (Bó and Fréchette 2018: 110-111).

7.4 Concluding remarks

Bó and Fréchette explain that choices made in infinitely repeated games likely are not independent of one another. Therefore, this lack of independence can help support cooperation over time, as states condition their future behavior on past events (ibid, 78). As such, states learn to play the game as they go along. In light of these considerations, given the hypotheses discussed and the agreements presented, it is evident that Norwegian-Russian petroleum relations in the High North are very much in the pipeline. They may progress for some time, then stagnate suddenly, and then flourish again later.

In this sense, their cooperative petroleum relationship in the High North, with reference to the agreements discussed in this thesis, can be viewed as a strategy of tit-for-tat. This is because they both play cooperatively as long as the other state does, but any defection on either part will trigger a period of punishment, in which the other state will not cooperate (Dixit, Skeath, and Reiley 2015: 381; Jervis 1988: 339).

What is clear, nonetheless, is that both Norway and Russia are determined to cooperate in order to push petroleum developments in the High North, now and in the future. Much is still unknown about the relationship between these two states and what makes them want to cooperate on petroleum matters in this region. What is probable, however, is that mutual interests and petroleum interdependence are important factors pushing these two states to act cooperatively on petroleum matters in the High North. Nevertheless, these factors cannot, neither single-handedly nor together, explain the whole picture.

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Appendix A

Map of the Circumpolar Arctic

Source: www.arcticstat.org. Accessed on 26/01/2018.

Appendix B

Timeline of Events

Date	Event
1957	The Varangerfjord Agreement is ratified
1958	Geneva Conventions on the Law of the Sea
1969	First commercial oil discovery made on the Norwegian continental shelf
1973-74	OPEC I
1976	Norway and the Soviet Union announce the extension of their economic zones
1978	The Grey Zone Agreement is ratified The Soviet Union starts comprehensive seismic surveying in the Barents Sea
1979-80	OPEC II
1980	First production licenses north of the 62th degree awarded
1982	UNCLOS established
1986	OPEC III
1987	Gorbachev gives Murmansk speech calling for an 'Arctic peace zone'
1988	Discovery of the Shtokman gas field
1989	Prirazlomnoye oil field drilled
1990-91	Breakup of the Soviet Union
1992	Establishment of the Barents Secretariat
1996	Establishment of the Arctic Council
2006	Fusion between Statoil and Hydro announced Norwegian 'Government's strategy for the High North' announced
2007	Russia plants a flag on the North Pole seabed Production of the Snøhvit field starts
2008	Russian 'National Security Strategy' for the Arctic announced USGS release appraisal of undiscovered Arctic oil and gas resources Ilulissat Declaration announced
2009	Follow-up Norwegian document 'New building blocks in the north' released Russia releases its 'Energy strategy of Russia for the period up to 2030'
2010	The Delimitation Agreement is ratified
2012	The Shtokman field is declared unprofitable for the foreseeable future
2013	Russian follow-up document on its Arctic Strategy released
2014	Russian annexation of Crimea and subsequent war in eastern Ukraine First cargo of oil from ice-covered waters loaded from Prirazlomnoye field
2015	Russian State Commission on the Development of the Arctic established