

Success below the surface - Explaining success in the management of petroleum resources in Norway and Brazil

Marco Antonio Gonzales Rodriguez

NORWEGIAN UNIVERSITY OF LIFE SCIENCES
Department of Economics and Resource Management
Master Thesis 30 credits 2013



ACKNOWLEDGEMENTS

The writing of this thesis has at times been both challenging and frustrating. However, it has been a learning experience and it has also given me much more interest in the topic.

First of all I would like to thank my supervisor, Carl Brønn for his patience, support and advice during the process of writing this thesis.

I would also like to thank to my family and friends in Norway and Bolivia for supporting and motivating me. Sincere gratitude also to my friends from the Department of economics and resource management at the University in Ås.

Finally, I want to thank my wife for helping me with the language and proofreading and for help and trust during the work with this thesis.

The responsibility for possible errors in the following text remains mine.

Oslo, 7 August 2013

Marco Antonio Gonzales Rodriguez

ABSTRACT

This thesis is about the petroleum sectors in Norway and Brazil and studies the relationship between the state and the national oil companies. Both Norway and Brazil have been successful in the management of petroleum resources. In this thesis I analyze how organizational cultural factors can contribute to a better understanding and explanation of success in the petroleum management in Norway and Brazil. In this thesis success in the petroleum sector is defined as a country's ability to manage the petroleum resources in a way that 1) yields economic growth through resource rents, 2) ensures society's benefit and control and 3) meets national goals for the sector.

This study is qualitative and comparative, using a theory of organizational culture in case studies of Norway and Brazil in order to understand better why both these countries have obtained success in their petroleum management despite the differences between the countries on other explanatory variables. Through analyzing the organizational cultural traits of involvement, adaptability, mission and consistency in the principal-agent relationships between the states and the national oil companies (NOCs) Statoil and Petrobras, this thesis investigates the causal relationship between organizational culture and success.

The states and the NOCs are interdependent in the development of the petroleum sector. Shared values and goals are therefore important for successful development over time. Through studying the cultural traits of the organization building in the petroleum sectors in Norway and Brazil, this thesis has found that both the organizational cultures in the principal-agent relationships between the states and the NOCs and the organizational culture within the NOCs score high on all the four abovementioned cultural traits. Strong organizational culture in the petroleum sector is thus positively related to petroleum success in both Norway and Brazil.

TABLE OF CONTENTS

	Page
List of figures.....	3
List of tables.....	3
Abbreviations.....	4
1. Introduction	5
1.1 Research question	7
1.2 Contribution and scope of the thesis.....	7
1.3 The structure of the thesis.....	8
2. Background and literature review.....	8
2.1 The petroleum sector.....	8
2.2 The resource curse.....	10
2.3 Previous studies of the petroleum sectors Norway and Brazil.....	11
2.4 National factors in Norway and Brazil.....	13
2.4.1 Political factors.....	13
2.4.2 Economic factors.....	14
2.4.3 Other factors.....	15
2.4.4 National Culture.....	16
2.4.5 Discussion of Hofstede.....	19
2.5 Institutions and Organizations.....	20
2.6 Organizational cultural traits.....	23
3. Conceptual framework.....	25
3.1 Success.....	25
3.2 Organizational culture.....	26
4 Methods and research design.....	28
4.1 Measuring organizational culture.....	28
4.2 Most different cases.....	32
4.3 Validity and reliability concerns.....	34
5. Case studies.....	35
5.1 Petroleum success stories.....	35
5.1.1 Norway.....	35
5.1.2 Brazil.....	38
5.2 Cultural factors.....	41

5.2.1 Norway.....	41
5.2.2 Organizational culture in the Norwegian petroleum sector.....	52
5.2.3 Brazil.....	53
5.2.4 Organizational culture in the Brazilian petroleum sector.....	62
6. Comparative analysis.....	63
7. Conclusion.....	66
8. References.....	69

LIST OF FIGURES

Figure 2.1 The Iceberg model of culture.....	16
Figure 2.2 Hofstede's (2013) analysis of national cultural dimensions in Norway and Brazil.....	19
Figure 3.1 Conceptual model.....	27
Figure 5.1 Net cash flow to the state from petroleum activities.....	36
Figure 5.2 Brazil's liquid fuel production 2003-2013.....	39

LIST OF TABLES

Table 2.1 Theoretical model of cultural traits.....	24
Table 4.1 Operationalization of organizational cultural traits in the petroleum sector...	29
Table 4.2 Measurement of scores on organizational cultural indicators.....	30
Table 4.3 Most different systems design.....	33
Table 5.1 Summary of success variable.....	40
Table 5.2 Organizational culture Norway - Summary table.....	51
Table 5.3 Organizational culture Brazil - Summary table.....	61

ABBREVIATIONS

ANP: National Agency for Petroleum, Natural Gas and Biofuels (Brazil)

CNPE: National Energetic Policy Council (Brazil)

CEO: Chief Executive Officer

CCS: Carbon Capture and Storage

EIA: Energy Information Administration

EIU: Economist Intelligent Unit

IOC: International Oil Company

MME: Ministry of Mines and Energy (Brazil)

MPE: Ministry of Petroleum and Energy (Norway)

NOC: National Oil Company

NPD: Norwegian Petroleum Directorate

NCS: Norwegian Continental Shelf

OPEC: Organization for Petroleum Exporting Countries

RGI: Resource Governance Indicators

SDFI: State Direct Financial Interest

1. INTRODUCTION

Petroleum resources are non-renewable, scarce and unevenly distributed between countries. They are also valuable and able to yield great income to the countries lucky enough to host them. However, many petroleum rich countries have not been able to manage the resources in a successful way, they have failed to benefit from their natural wealth and experienced the resource curse (Soros 2007:XI).

The petroleum sector is complex and successful management involves many interdependent actors that all need to avoid the common pitfalls of the resource curse (see e.g. Larsen 2004, Thurber et al. 2011, Karl 1999). Some countries are nevertheless successful (ibid.). This thesis starts with an interest in understanding why these countries have succeeded in petroleum management.

Since the petroleum sector is complex, success consists of several interdependent factors. First of all the country has to explore and produce petroleum and generate resource rents. Second, the resource is national property and thus owned by the country's population, so successful management of the resources and spending of the resource rent should maximize society's benefit and the population's control of the rents. Finally, successful management involves meeting the country's own goals for the sector. In accordance with this complexity, this thesis defines success in the petroleum sector as a country's ability to manage the petroleum resources in a way that 1) yields economic growth through resource rents, 2) ensures society's benefit and control and 3) meets national goals for the sector.

According to Thurber et al. (2011) Norway and Brazil have both succeeded in managing their petroleum sectors. They have achieved good performance and managed to make petroleum a driver for economic growth and development. Today Norway is one of the world's largest oil exporters and Brazil is considered an important emerging exporter of oil and a technological leader in deep-water activities. Norway and Brazil also both have high scores on all the success indicators in this thesis, their petroleum sectors are thus more successful than similar sectors in many other countries.

In order to explore the question of why some countries succeed in their petroleum sector management and avoid the resource curse, this thesis concentrates on the upstream petroleum sectors in Norway and Brazil, and particularly the relationship between the state and the oil companies. The exploration and production of petroleum are very specialized activities, and as owner of the resource the state needs to rely on oil companies to perform these tasks on its behalf. The relationship between the state and the company is a classical principal-agent relation where the state as the principal depends on the company to generate resource rent, while the company, being the agent can use its asymmetric information about the petroleum resource to cheat the state and keep more of the resource rents for itself (Hults 2012:66-69). As most other resource rich countries, both Norway and Brazil have created national oil companies (NOCs) to alleviate the problem of asymmetric information, but the relationship between the state and the NOC is still one of principal-agent, where the agent also depends on the principal for access to the resource and development possibility (ibid.)

However, even if both Norway and Brazil are successful petroleum managers, they are also very different cases. In Norway, the presence of a stable economic, political and institutional context has been highlighted as the key to successful petroleum management (Larsen 2004, Thurber et al. 2011, Karl 1999). The political and institutional frames and structures that are emphasized as constituting a favorable context for petroleum management success in Norway, are however quite different in the Brazilian case. I therefore argue that other, more sector specific variables are required in order to understand how similar successful developments have taken place in both countries. Within the tradition of management research, scholars have emphasized the invisible cultural values, norms and practices as important explanatory factors in their analyses of what leads to successful management (Denison and Mishra 1995, Zamanou and Glaser 1994).

The national context will always have an effect on success in the petroleum sector. However, a principal-agent relationship based on a strong common organizational culture will make the actors in the sector more able to foresee and handle internal and external challenges. Political changes, economic volatility and institutional weakness are also such challenges that can be foreseen and handled much better if the actors in the petroleum sector are enabled through an organizational culture that score high on involvement, adaptability, mission and consistency. Through studying the cultural traits of the organization building in the petroleum sectors in Norway and Brazil, this thesis has found that both the organizational cultures in the principal-

agent relationships between the states and the NOCs and the organizational culture within the NOCs score high on all the four abovementioned cultural traits. Strong organizational culture in the petroleum sector is thus positively related to petroleum success in both Norway and Brazil.

1.1 Research question

This thesis has a holistic approach to the petroleum sectors in Norway and Brazil and argues that the different actors in the sector are mutually dependent. I argue that the organizational culture developed through the principal-agent relationship is crucial for the organizational cultural development within the NOC, and later also the other way around. The “principal-actor” I focus on in this thesis is the ministry of energy representing the state in the petroleum sector in both Norway and Brazil. The role of other state actors, such as the national regulatory body and the national assembly, will also be analyzed where they are relevant for the principal-agent relationship. The “agent-actor” I focus on in the national oil companies in the petroleum sectors in Norway and Brazil; Statoil and Petrobras respectively.

The research question for this thesis is exploratory rather than testing. I am interested in exploring how the factors of organizational culture can complement the understanding of the success in petroleum management in Norway and Brazil and contribute to explaining the similarities between two otherwise relatively different cases. This thesis considers the following main research question: *How can an analysis of organizational cultural factors contribute to a better understanding and explanation of success in the petroleum sector management in Norway and Brazil?*

1.2 Contribution and scope of this thesis

This thesis starts with a review and analysis of existing literature on petroleum success in Norway and Brazil. From the analysis of previous findings, it is established that both Norway and Brazil have escaped the resource curse and have managed to turn their petroleum resources into a valuable source of income for their countries. This has been possible in both these countries despite quite different political, economic and cultural contexts.

In order to narrow the focus to a manageable research question for a study of this scope, a step back to the basic dynamics of the petroleum sector is useful. In accordance with Marcel (2006:5) this thesis argues that the main first source to success in the petroleum sector is the

generation of resource rent through the upstream activities of oil and gas extraction and production. The journey from the resource extraction to society's benefit of the resource rent is however dependent on the actors in the sector, their abilities and the relationship between them. This can be studied through analyzing the organizational culture in the petroleum sector.

This thesis contributes with a comparative perspective on the petroleum sectors in Norway and Brazil. I argue that the analysis of organizational cultural traits can contribute to explaining how successful management has emerged and been consolidated throughout the petroleum sectors in both these countries. Through comparing the organizational culture in the petroleum sector in a country with favorable national conditions to the organizational culture in the petroleum sector in a country without these favorable conditions, but with the same successful outcome, this thesis contributes to theory building on how organizational culture is related to successful management.

1.3 Structure of the thesis

The next section outlines the background for this thesis and presents a literature review of previous studies and the different success factors often highlighted in studies of the petroleum sector in Norway and Brazil. It also introduces the literature on organizational culture and previous use of these theories in petroleum sector studies. Section 3 introduces the conceptual framework for the analysis, and section 4 presents the discussion of the methods and research design. In section 5 the case studies of Norway and Brazil are presented, including an analysis of the relationship between organizational culture and success in each country. Section 6 presents the comparative analysis of the two cases and the conclusion is presented in section 7.

2. BACKGROUND AND LITERATURE REVIEW

2.1 The Petroleum Sector

Petroleum is a subsoil resource. Independent of private property rights in the particular areas where they are found, the legal regulation in most countries classifies these resources as national assets and thus state property¹. The state is therefore responsible for the management

¹ The main exception to this kind of regulation is the United States (Guirauden 2007:179).

of the resource and can also claim rents from the resource (Sachs 2007:180). How this management is exercised nevertheless varies between states. States can choose to sell the property right to private companies, thus limiting its income to the sale price and eventual revenue taxes. On the other extreme, states can exercise full monopoly with state companies performing all actions in the sector. In between these two options exist numerous hybrid management possibilities (Guirauden 2007:179-180).

According to Mommer (2002) the economic literature that is based on studies of manufacturing and other industrial production often argue that the ownership of resources does not matter as long as the production takes place in an open economy where the market sets the right price on the commodity. In his study of governance models for mineral resources, Mommer (2002:6) argues that the disregard of the importance of ownership in economic literature causes problems for economic studies of the petroleum sector. Since petroleum resources require long-term investments and perspectives, Mommer (2002:88) argues that the technical and economic advantage of public resource ownership is proven beyond doubt. But it may be difficult for states to manage their resources in an efficient way, and in any management regime the different actors have to work together towards a common goal if success is to be attained (Mommer 2002).

Mommer (2002:3) mentions three main actors as important; first, the government as owner of the resource, represented by the ministry of energy or equivalent agent; second, the producing companies that make investments and take risks, these can be both national and international oil companies; third are the consumers that have to pay the price of the final product. In many countries there are also concession agents or regulative bodies that operate between the ministry and the oil companies. Since this thesis concentrates on the management of the upstream part of the petroleum sector, the government actors and the companies are the actors included in this study.

International oil companies (IOCs) have existed since the beginning of commercial petroleum extraction and their influence in the world oil market has varied with the activities of OPEC (Organization for Petroleum Exporting Countries) and other sector developments. National oil companies (NOCs) “are political creations” (Victor et al. 2012:23). Many NOCs were created by governments that wanted to gain better control of their petroleum sectors and keep more of

the resource revenues for themselves. However, the performances of NOCs can vary between countries and only a few NOCs are economically efficient (ibid.).

According to Marcel (2006:5), the upstream petroleum business is a “battleground for resource nationalism”. Performing upstream activities are the most important for NOCs, as these are “the revenue-generating activities that make [NOCs] so important to their country” (Marcel 2006:5). Not all NOCs are fully state-owned, but the relationships between the NOCs and the state are still strong and most NOC employees feel they are part of a national project (Marcel 2006:6).

The success of this national project however, depends, according to Marcel (2006:8-9) on the national operating environment and how this environment “improves or reduces the national oil companies’ capacity to respond to external challenges” (Marcel 2006:9). The capacity of both the NOCs and the state agents in the petroleum sector to deal with new internal and external challenges is crucial for success according to Marcel (ibid.).

2.2 The resource curse

Petroleum resources and the potential wealth that comes with them have engaged scholars from different disciplines for decades. Especially the apparent paradox that resource rich countries tend to score lower on a number of economic development indicators than countries without petroleum do, has been analyzed from different perspectives, trying to find explanations and solutions for countries to avoid this resource curse. Some of the findings in the economic literature are of particular interest to this thesis.

The starting point for much of the resource curse literature is the possibility states have to use the resource rent to the favor of its populations, but their lack of success in attaining this. Segal (2012) emphasizes how resource rents differ from other types of government income; “resource rents are the closest we are to manna from heaven” (Segal 2012:340). Still, Segal argues, this rent income is extremely hard to manage since the income level is volatile and the resource is exhaustible. Petroleum rich countries often spend too much when the rent income is high, causing economic problems when rents decrease due to lower oil extraction or prices. Segal (2012:347) recommends long-term planning and saving to avoid these problems. He argues against spending that is not economically profitable, such as fuel subsidies and public sector over-staffing. The whole population should benefit from resource rents, but direct

distribution programs that target poor people and reduce inequality are also recommended (Segal 2012).

2.3 Previous studies of the petroleum sectors in Norway and Brazil

Scholars investigating the resource curse have also been quite interested in studying the case of Norway, as one of the few countries that have moved in the opposite direction of the resource curse and turned its petroleum resource into a source of economic growth and socio-economic development. Karl (1999) is one of the scholars that have followed the development in petroleum rich states and she has written extensively on the resource curse challenge, calling it the “paradox of plenty” (Karl 1999).

According to Karl (1999), Norway has been able to implement many of the recommended policies for successful petroleum management, such as an oil fund that removes oil revenues from the day-to day control and spending of politicians (Karl 1999:45). In explaining Norway’s success she emphasizes the functioning judicial system, civil society interest groups and well-organized non-oil industrial interests that were already in place when petroleum rents started flowing into the government, preventing the creation of an over-spending oil-renter economy (Karl 1999).

Larsen (2004) has studied how Norway avoided both the resource curse and the Dutch disease and he agrees with many of Karl’s conclusions. Larsen (2004) says Norway lagged behind its neighboring countries in economic development and growth in the 1960s, but performed better than the same neighbors in the 1990s. This economic development coincides with the discovery and development of petroleum resources and Larsen (2004) argues that this proves that Norway escaped the resource curse. According to Larsen (2004), the main reason for this success was the already established centralized wage negotiations in Norway that made sure manufacturing remained the wage leader and kept focus on the interests of the competitive industry sector. Like Karl (1999), Larsen (2004) also points out that Norway made sure the spending of oil revenues was macroeconomically sound and used much of the revenues for savings and investments abroad in order to avoid high volatility in the national economy.

In a World Bank working paper Eifert et al. (2002) investigate how political economy can explain differences in success in oil exporting countries. They emphasize long-term saving, short-medium-term stabilization and effective use of rent income, and find that countries that

perform well on one of these indicators typically have been able to do well on the others (Eifert et al. 2002:25). They further find that political economy factors are much more likely to be barriers to successful management than technical factors are (ibid.). Eifert et al. (2002) also emphasize the success of Norway and find that the democratic system in Norway, with consensus building, transparent budgetary processes and non-oil traded sectors that favor cautious petroleum management, constitutes a clear advantage for successful management for petroleum resources.

Over the years Norway has been used as an example to follow for other resource rich countries, but not all scholars think a success recipe is exportable. Thurber et al. (2011) have studied Norway's relative success in managing its hydrocarbon sector, the development of institutions and separated government functions. Their point of departure is that international development institutions have recommended other petroleum rich countries to organize their petroleum sectors in accordance with the "Norwegian model"; using three different government bodies; a government ministry, a regulatory body and a national oil company. After analyzing the developments in the petroleum sectors in ten other countries, they conclude that this "separation of functions is not a prerequisite to successful oil sector development" (Thurber et al. 2011:1). They further find that separation of functions work best in countries with high institutional capacity and recommend countries to build capacity before separating functions.

Thurber et al. (2011:7-11) also compare the development in the Brazilian petroleum sector to the Norwegian model. Brazil was successful in their petroleum management although they had a much lower separation of functions than Norway until 1997, when Brazil first created a regulatory body separate from the ministry and the NOC (ibid.). The study concludes that even though both Norway and Brazil now have the same separation of institutional functions, other successful petroleum managers have a different administrative system, so the separation of functions is not enough to explain success in Norway and Brazil (Thurber et al. 2011:9).

Large parts of countries' day-to-day petroleum management take place in the national oil companies. Victor et al. (2012) have edited a large comparative study of NOCs where they analyze and explain the variations in performance and strategies of NOCs. Statoil and Petrobras come out as two of the best functioning and performing NOCs in the study (Victor et al. 2012:898). According to Victor et al. (2012), one of the main reasons for this is that the

two companies have few tasks related to non-hydrocarbon services. They are thus allowed to concentrate on what they know best and are not directly responsible for funding of welfare projects etc., this management is done by other state institutions (ibid.). Two of the chapters in the book have concentrated on Petrobras and Statoil respectively, and will be important sources of data for this thesis (de Oliveira 2012, Thurber and Istad 2012).

2.4 National factors in Norway and Brazil

As outlined in the above literature review several national factors have in previous studies been found to be positively or negatively related to success in the petroleum sector. This section outlines these factors in Norway and Brazil in order to explain the background for petroleum resource development in both countries and present differences and similarities between the two national contexts. The development of a petroleum sector is long term. This thesis has a main emphasis on the current situation in Norway and Brazil, but an important part of the analysis investigates how the current success is dependent on developments that go back to the start of the sector in the 1950's in Brazil and in the 1970's in Norway.

2.4.1 Political factors

Eifert et al. (2002:25) argue that mature democracies have advantages when it comes to making decisions that lead to successful long-term planning and management of oil rents. According to Sachs (2007:175-192) an open political system with transparency in income, expenses and investments is important for avoidance of the resource curse and success in the petroleum sector. A democratic, transparent and stable political system has thus been found to be positively related with success in the petroleum sector.

Norway was already a stable and consolidated democracy when oil was found at the end of the 1960s. Since then the country has continued to have a well-functioning democratic political system. Brazil on the other hand has experienced large political changes. The country was democratic at the establishment of a national petroleum sector in the 1950s, but a military coup changed this in 1964. After ten years of dictatorship and ten years of transition, democracy was re-established in 1985, but political turbulence endured until the mid-1990s. Brazil is now considered a relatively well-consolidated democracy.

There are several research institutes that measure the level of democracy and freedom in the countries in the world. Many of the annual measurements are however quite new and do not

include data from the 1970's, 1980's or 1990's, but the more recent numbers can still illustrate the difference between Norway and Brazil on this variable.

The Economist Intelligent Unit² (EIU) scores the democracy in countries on a scale from 0 to 10 where 10 is the most democratic. Norway scores 9.55 on this index in 2006 and 9.80 in 2011. Brazil scores 7.38 on the same scale in 2006 and 7.12 in 2012. On the EIU score for risk of social unrest, the score goes from 0 to 10 where 10 is the highest risk of social unrest. For 2009/2010 Norway scores 0.4 on underlying vulnerability and 2 on economic distress, summing up to a score of 1.2 on risk for social unrest, number 165 of 165 countries. The same year Brazil scores 5.8 on underlying vulnerability and 5.0 on economic distress, summing up to a score of 5.4 on risk for social unrest, number 105 of 165 countries.

The index of "freedom in the world" from Freedom House³ scores the freedom in countries from 1 to 7 where 7 is "not free". In 1999 Norway scored 1 on this index and in 2013 it also scored 1. Brazil scored 3.5 in 1998 and 2 in 2013.

In sum, the political stability and democracy in the period of interest has been very high in Norway and quite low in Brazil. A stable democratic regime has without doubt been a great advantage to petroleum management in Norway, but given the score on this variable in Brazil, success is also possible without this advantage.

2.4.2 Economic factors

The level of economic development will influence a state's capacity to manage the petroleum sector in an efficient way (Victor et al 2012:18). Larsen (2004) argues that pre-existing mature and functioning export industries in areas other than petroleum will be an advantage for a state when establishing a petroleum sector. High corruption levels are a weakness for economic development, and several scholars see high corruption as a hindrance for successful petroleum management, both at the establishment of the sector and in the further development and production stages (Al-Kasim et al. 2013, Larsen 2004, Victor et al 2012). In her study of the resource curse Karl (1999) argues that an oil rich country with poor economic performance is less likely to improve its performance than a poor country without such petroleum resources. Low economic development will thus not only be a hindrance to

² Data available through URL: <http://www.eiu.com/>

³ Data available through URL: <http://www.freedomhouse.org/>

successful management, it will also be worsened by the unsuccessful petroleum management. High economic development and low corruption are therefore positively related to successful petroleum management (Karl 1999).

There are different ways to measure economic development; in this thesis I measure with three indicators that are commonly used for this purpose. As indicators of economic development I will use “socio-economic inequality”, “GDP per capita” and “corruption level”. The World development indicators (WDI) of the World Bank⁴ measure inequality with the GINI coefficient where 0 is perfect equality and 100 is perfect inequality. Norway’s GINI is only measured in 2000, and the score is 25.8. Brazil has more measures and has had a slight decrease in inequality from 57.9 in 1981 to 54.7 in 2009, still one of the world’s highest socio-economic inequalities. WDI also measures GDP per capita. Norway has a high GDP per capita that has grown from 26 010 USD in 1990 to 35 860 USD in 2000 and 98 860 USD in 2012. Brazil on the other hand started with 2700 USD in 1990, to 3860 USD in 2000 and an increase to 11 360 USD in 2012.

Transparency International’s⁵ corruption perception index scores the corruption in countries between 0 and 100 where 100 is very low corruption. In 2012 Norway was the 7th least corrupt of 176 countries with a score of 85, and Brazil was number 69 with a score of 43.

The scores on economic development of the two countries are thus very different.

2.4.3 Other factors

There are however also some similarities between the petroleum sectors in Norway and Brazil that may have influenced success. First, both countries have most of their petroleum reserves offshore and are dependent on deepwater technology to produce oil and gas. This is normally seen as a factor that could make it more difficult to succeed in the petroleum sector management since the production is both investment- and knowledge-intensive, and the economic and environmental risks are higher than in onshore operations (Lepez 2007). Second, the two countries were both producers and exporters in other raw material sectors before the petroleum sector was established. This experience can have had a positive influence on the building of an organizational culture. However, countries that in many

⁴ All data available through URL: <http://data.worldbank.org/data-catalog/world-development-indicators>

⁵ Data available through URL: <http://cpi.transparency.org/cpi2012/results/>

respects have failed to succeed in their petroleum management, such as Nigeria and Bolivia, were also traditional exporters of other natural resources before oil and gas was discovered (Victor et al. 2012).

2.4.4 National culture

Culture is often used to explain actions and perceptions, especially in explaining differences in performance between groups or countries (Bang 1998:17-19). Norway is a small country that has until recently been considered culturally homogeneous, whereas Brazil has the world's fifth largest population and has for centuries been a culturally heterogeneous society. It is accordingly easy to understand that the cultural differences between the two countries are large.

Culture is however a wide expression that can be used to describe almost anything. The iceberg metaphor is therefore useful in order to structure the concept of culture in a meaningful way for this thesis. The iceberg model serves to illustrate that only the visible part of culture is above the surface, at the top of the iceberg. The majority of cultural aspects are however invisible and stored in the large part of the iceberg that is below the surface (Dahl 2004; Antal and Friedman 2008). Figure 2.1 illustrates the iceberg model.

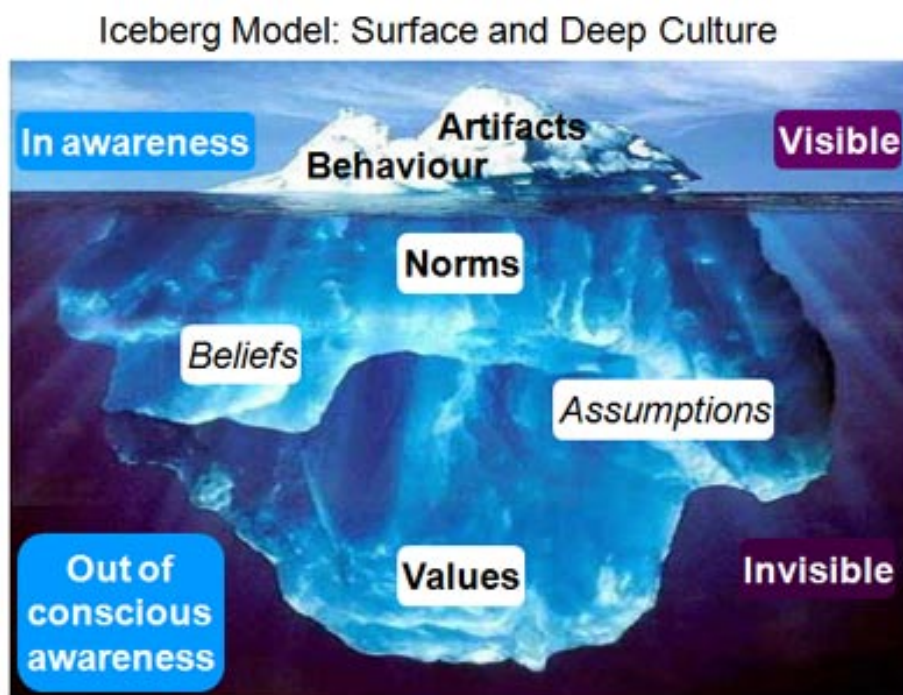


Figure 2.1 The Iceberg model of culture

Source: <http://www.diploweb.com/Understanding-culture-and-managing.html>

National culture is the backdrop on which behavior develops and decisions are made. The national culture below the water surface in the iceberg model has to do with social norms and values that guide behavior and communication. If the national cultures in two countries are similar, the background norms, values and assumptions that decisions are made on are similar, and the decisions can then also be expected to be similar. For instance would societies with high risk aversion be expected to have a lower general acceptance of risky political or economic decisions than a society with low risk aversion, and societies with low hierarchy would be expected to have a lower general acceptance of top-down decisions than high hierarchy societies. When it comes to successful petroleum management, it could be that some national cultures to a greater extent than others favor decisions that are positively related to success. In order to find out if this is the case for Norway and Brazil, a systematic comparison on national cultures is needed. One of the most used and quoted systematizations of national norms and values is the national cultural dimensions developed by Hofstede (e.g. 2001).

Hofstede (2001) presents five dimensions of national culture that can be compared between countries. These are based on his extensive studies of the same transnational company in many countries. Hofstede (2001) argues that although individuals may differ from the national norm, the national culture is present in all parts of society and will be recognizable when studying decision making by political institutions, companies or individuals. Since countries score differently along these dimensions, Hofstede (2001) says that solutions to societal challenges would work differently in the different countries and thus that decisions leading to success in one country may not lead to success in another. Hofstede's (2013) five cultural dimensions are *power distance*, *individualism*, *masculinity/femininity*, *uncertainty avoidance* and *long-term orientation*.

In his analysis of the national cultural dimensions in Norway and Brazil, Hofstede (2013) defines the dimensions and finds the following results when giving the countries scores between 0 and 100.

Power distance is “the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally” (Hofstede 2013). Brazil's score is 69, more than twice as high as Norway's 31 towards a hierarchical culture.

Individualism “has to do with whether people’s self-image is defined in terms of “I” or “We”. In Individualist societies people are supposed to look after themselves and their direct family only. In Collectivist societies people belong to ‘in groups’ that take care of them in exchange for loyalty” (Hofstede 2013). Norway scores 69 on this dimension towards an individualistic culture, almost the double of Brazil with 38. Brazil’s score is much more collectivistic.

Masculine societies are driven by competition, achievement and being the best, while feminine societies appreciate values such as caring for others, having a good life and liking what you do (Hofstede 2013). The Norwegian culture is very close to the femininity end of the scale on this dimension with a score of 8, while Brazil is much more masculine, about mid-way between the two poles with 49.

Uncertainty avoidance is the “extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these” (Hofstede 2013). Brazil scores high on this dimension, meaning that the Brazilian culture strongly avoids uncertainty. Norway scores mid-range with 50 and thus has a culture with higher acceptance of uncertainty compared to Brazil that scores 76.

Long-term orientation is “the extent to which a society shows a pragmatic future-oriented perspective rather than a conventional historical short-term point of view” (Hofstede 2013). Norway scores below the middle on this dimension with 44, and has more of a short-term culture than Brazil that scores above middle with 65. See an illustration of all the results in figure 2.2.

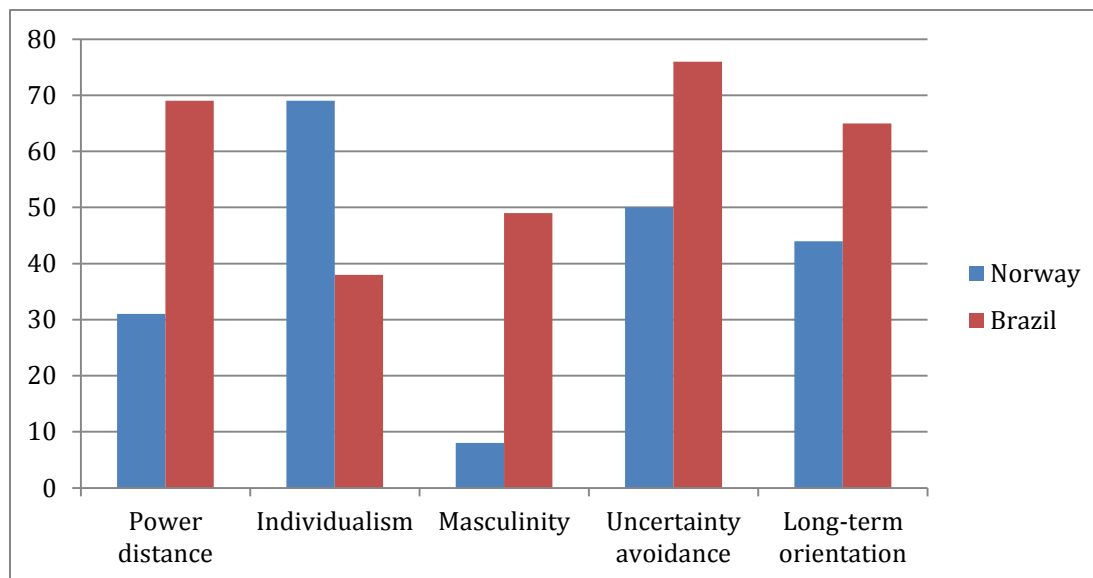


Figure 2.2 Hofstede's (2013) analysis of national cultural dimensions in Norway and Brazil

According to these measures, the differences in national culture between Norway and Brazil are quite large. It is therefore unlikely that the national culture in the two countries can explain the similar outcome of success in the petroleum sector management in the two countries. This information is however important for understanding the environment in which the organizational cultures in the petroleum sectors have developed.

2.4.5 Discussion of Hofstede

Hofstede has been criticized for his methodology since his measures of national culture are based on survey and interview data only from the firm IBM. The critics argue that it is questionable if findings from studying only one company can be generalized to the whole country (Gatley et al. 1996:102). Hofstede defends his method saying that the study of the same firm in different countries makes him able to disregard the cultural factors of the company and compare the values of otherwise similar persons (same age, gender and company position) across countries (ibid.).

In this thesis the scores of Norway and Brazil on Hofstede's national cultural dimensions will be used mainly as background variables, and the critics are thus not directly relevant for the analysis. The outline of the national cultural dimensions in Norway and Brazil are however useful information for the analysis of organizational cultural traits in the petroleum sectors in the two countries.

First of all the different scores of Norway and Brazil on the national cultural dimensions serve to strengthen the assumption that the organizational cultural traits in the petroleum sector are more important for success in this sector than the national cultural factors. Second, the national cultural concept of Hofstede gives a good introduction to the concept of culture used in this thesis and improves the understanding of the iceberg model since Hofstede's five dimensions are clearly not visible cultural traits in the way flags, food, Christmas traditions and music constitute national artifacts and behaviors. Thirdly, the national cultural dimensions can enhance the understanding of how the organizational cultural traits within the petroleum sectors in Norway and Brazil have developed the way they have.

Critics have argued that Hofstede's national culture factors are too vague to be applied in studies of organizations. According to Gatley et al. (1996:69), these scholars argue that the institutional frames that structure organizations can tell more about the national differences than the cultural values. However, these institutional frames do not just appear in a vacuum without context, and Khalil (1995) makes a good point in arguing that the main attention should be given to the practices within the frames, as the frames themselves do not guarantee any specific function.

2.5 Institutions and organizations

As seen in the discussions and outlines above, Norway and Brazil score quite differently when it comes to national culture and the political and economic factors that facilitate petroleum success. But what about the structures, institutions and organizations within the petroleum sector? Maybe is it not a necessity to have a favorable national context if the key to success can be found within the petroleum sector? If the actors in the sector are able to foresee and handle internal and external challenges, they would also have a much larger ability to foresee and handle aspects of the national context that are less favorable to success.

Studies of institutions and organizations appear frequently in economic literature, but there is no universal agreement on what these two concepts describe. In order to have a discussion of the roles of institutions and organizations, a definition of the two concepts to be used in this thesis is therefore needed.

Hodgson (2006:8) discusses the difference between institutions and organizations and define organizations within the broader term of institutions: "Organizations are special institutions

that involve (a) criteria to establish their boundaries and to distinguish their members from nonmembers, (b) principles of sovereignty concerning who is in charge, and (c) chains of command delineating responsibilities within the organization” (ibid.). Hodgson further mentions other uses of the term organization in the economic literature, such as using the term organization interchangeably with the terms “firm” or “company”, or others that use the term organization referring to the national economy. “Organization” is also used interchangeably with the term “institution” by some scholars according to Hodgson (2006), while others are strongly opposed to mixing these two terms and give them quite distinct definitions (Hodgson 2006).

Khalil (1995) is one of the latter scholars; he considers institutions and organizations to be very different types of entities. According to Khalil institutions are the rules and regulations that organizations operate within. He opposes the approach to management that believe efficient institutions are the key to success in economies, companies or sectors and argues that the tastes and goals of organizations should be studied instead (Khalil 1995:461). “It is an illusion to think that the success or failure of organizations is the result of the “correct” mix of laws and regulations” (Khalil 1995:462).

Khalil (1995:461) distinguishes between exogenous and endogenous variables and says that some success or decline (non-success) can always be explained by exogenous variables. However, when it comes to endogenous explanatory factors, the role of organizations is important, more important than the rules and regulations that frame their actions.

One institutionalist approach argues that the quality of state institutions influence how the petroleum sector is managed and how well the state is able to control the sector and the companies working within it. This view is presented by Victor et al. (2012:18-19), who argue that the ability to attain goals and reach success within the petroleum sector will be particularly difficult for states with weak institutions, as these will easily lose control of the sector and unwanted activities such as rent seeking and corruption can emerge. Kolstad and Wiig (2008:11) also see institutional capacity as crucial for a distribution of resource rents that are beneficial for society.

The definition of institutions used in these arguments of institutional capacity is much more comprehensive than Khalil’s (1995) definition. Institutional capacity has to do with actors and

actions within and between institutions. Following Khalil (1995) however, action is not taken by institutions, but by organizations. Institutions are only the frames within which organizations can be capable and successful or not.

In this thesis I argue that institutional capacity is developed through organizational culture. I follow Khalil's (1995) definitions of institutions and organizations and argue that institutional structure, as in the rules and division of tasks between the actors in the petroleum sector, are the visible characteristics that can be identified at the top of the iceberg. Organizational culture, on the other hand, can be observed through traits and indicators, the culture lies on the part of the iceberg that is below the water surface and thus not directly observable.

Khalil compares the relationship between institutional frames and organizational culture with a theater play: "For a play to be successful, it is insufficient to have a play like *Hamlet*; there is a need for motivated actors and an appreciative audience" (Khalil 1995:461). For this thesis this can be translated to the national context in which the petroleum sector operates, and the organizational culture within the sector. The favorable national context would then be insufficient for success if the organizational culture does not motivate and enhance performance in the sector in the adequate way.

Some previous studies have investigated the national oil companies Statoil and Petrobras with an aim of analyzing the organizational or corporate culture within the companies. In her master thesis, Vilkenen (2006) interviews trainees in Statoil and finds that the trainee programs are adequate for creating a common organizational cultural identity between employees from different countries. Abreu et al. (2013) have studied how the change in Petrobras' monopoly in the Brazilian petroleum sector changed the corporate culture within the company. They found that employees felt a strong commitment to the company, but that the commitment was strongest for the ones that had worked the longest in Petrobras, and also significantly higher for the ones with a permanent contract compared to time-limited contracted personnel. I have not found previous studies with their main focus on the organizational culture in the whole petroleum sector in Norway or Brazil, but in her study of Middle-Eastern petroleum sectors, Marcel (2006) mentions common cultural traits and values as important for a well-functioning relationship between the state and the national oil companies.

2.6 Organizational cultural traits

Denison and Mishra (1995) have studied the relationship between organizational culture and effectiveness in companies. Their findings have later been confirmed by several studies of organizational culture⁶. Their measure for effectiveness is very similar to my above definition of success, they include both economic success such as growth and productivity, and also goal attainment, employee satisfaction and stability. Their findings of the relationship between organizational culture and effectiveness will therefore be adequate for my analysis of the relationship between organizational culture and success in the petroleum sectors in Norway and Brazil.

Denison and Mishra (ibid.) find four traits of organizational culture that are positively related to success. These are involvement, consistency, adaptability and mission. Denison and Mishra (1995:204) find that “involvement and adaptability are indicators of flexibility, openness, and responsiveness, and were strong predictors of growth”, while “consistency and mission are indicators of integration, direction, and vision, and were better predictors of profitability. Each of the four traits was also significant predictors of other effectiveness criteria such as quality, employee satisfaction, and over-all performance”. When it comes to the organization-specific success measures that has to do with attainment of the goals set by the organization, Denison and Mishra (ibid.) also found that the “four traits were strong predictors of subjectively-rated effectiveness criteria for the total sample of firms”.

The positive relation between these organizational cultural traits and success is also supported by other studies (see e.g. Zamanou and Glaser 1994). The traits are defined as follows:

Involvement has to do with how decisions are made. In a high-involvement organization the leaders have a high willingness to “include employee contributions in decision making” (Zamanou and Glaser 1994:477). This factor is also related to innovation capacity and the ability to generate new and profitable ideas within the company (Denison and Mishra 1995).

Consistency is about normative integration; it is “the collective definition of behaviors, systems, and meanings in an integrated way that requires individual conformity rather than voluntary participation” (Denison and Mishra 1995:214). In strong-consistency organizations

⁶ See the webpage <http://www.denisonconsulting.com/> for different studies where Denison has made further development and use of the model of organizational culture.

“the existing managers, executives, and high-status individuals are the agents of socialization, and newer lower-status individuals are the subjects” (ibid.).

Adaptability is “the capacity for internal change in response to external conditions” (Denison and Mishra 1995:215).

Mission. A good mission is long-term and combines economic and non-economic objectives. “First, a mission provides purpose and meaning, and a host of noneconomic reasons why the organization's work is important. Second, a sense of mission defines the appropriate course of action for the organization and its members” (Denison and Mishra 1995:216). To keep a long-term mission for the organization also in changing times is positively related to success.

Some of these four variables can seem to overlap or to be contradictory. Denison and Mishra (1995:214) for instance mention that there is a contradiction between involvement and consistency since high-involvement organizations will have much room for individuality and the conduct of individual actors will be less pre-described by a leader, while in high-consistency organizations the leaders socialize new actors into more pre-described actions. The four traits are therefore set up in a matrix to clarify which challenges they are considered best to handle, and the different cultural traits will therefore be important for an organization depending on the challenges that emerge.

Table 2.1 Theoretical model of cultural traits

	Change and flexibility	Stability and direction
External orientation	Adaptability	Mission
Internal orientation	Involvement	Consistency

Source: Denison and Mishra (1995:216)

In the matrix in figure 3.1 it is shown that adaptability and mission are answers to external challenges. A successful organization is able to adapt to external change factors, but without losing the most important long-term orientation and missions that identifies the organization’s practices. In the same manner involvement and consistency are answers to internal challenges where involvement is important in times when innovation, change and new solutions are needed, while consistency is important for the organization’s work as a team where all acting parties are performing their part of a common project. The following section will outline the

conceptual framework for analyzing the relationship between organizational culture and success in the petroleum sectors in Norway and Brazil.

3. CONCEPTUAL FRAMEWORK

This section starts with an outline of success and how this variable is defined and used in this thesis. This is followed by a definition of the concept of organizational culture and why it is suitable for a comparative analysis of success in the petroleum sectors in Norway and Brazil. Lastly the model of the conceptual framework is presented.

3.1 Success

In the literature on petroleum resource management, success is referred to and defined in different ways depending on the focus of the study. Former studies have established that Norway and Brazil are both successful in petroleum management, and the success is often referred to as the ability to escape the resource curse and generate resource rent in an efficient way (see e.g. Larson 2004, Victor et al. 2012, Thurber et al. 2011). This thesis defines and measures the success variable from a holistic perspective based on a set of indicators that are comparable across countries and that display the complexity in petroleum sector management.

According to the Oxford English Dictionary success is “the accomplishment of an aim or purpose”. When defining success in the management of petroleum resources it is therefore reasonable to relate the definition to aims and purposes. Through the literature review three different kinds of success factors in the petroleum sector are prevailing.

The first is economic success. In terms of economic aims and perspectives, success is resource management that maximizes profit or resource rent through growth and efficiency (e.g. Thurber et al. 2011, Mommer 2002).

The second success factor is related to the aim of society’s benefit of the resource. Since the natural resources are owned by the people and managed by the state, successful management should also include society’s benefit and control of the rents. Literature on the resource curse has pointed out that even though the sector is growing, resource rent is generated and the economic success is present, other negative factors such as patronage, corruption and undermining of democratic control hampers success since the population of the country does not benefit from the resource (e.g. Soros 2007:XI, Kolstad et al. 2009, Karl 1999).

The third and last success factor connected to aims and purposes is nation specific. Each petroleum rich state has its own goals for the petroleum sector. These goals are formulated and institutionalized within the cultural context of each country (Mommer 2002). The exact goals are therefore difficult to compare across countries. The success in accomplishing goals can however be compared. According to Hofstede (2001:408), an organization's performance should be measured against its objectives, and the success variable in this thesis also reflects the national success factors and attainment of these.

I will therefore use a set of three types of indicators to operationalize the measure of success in the management of petroleum resources in Norway and Brazil. First, the economic success factors will be measured as growth in the petroleum sector and resource rent generation. Second, success in society's benefit and control will be measured through the Resource Governance Indicators of Revenue Watch (2013) that include institutional and legal setting, reporting practices, safeguards and quality control, enabling environment, and NOC transparency and accountability. Third, success in accomplishing national goals will be measured through the level of attainment of the governments' main goals in the petroleum sector over time.

3.2 Organizational culture

According to Hofstede (2001:391) "Organizational cultures are the collective programming of the mind that distinguish the members of one organization from another". The petroleum sector is large and within the petroleum sectors in Norway and Brazil there are several actors and several different departments and sub-units with their own organizational cultures. I nevertheless argue that there are shared organizational cultural traits throughout the sectors that distinguish the sector from other sectors and actors in society and that can contribute to explaining why and how successful management has developed. This holistic view of the sector is supported by the fact that the upstream petroleum sector is a quite uniform segment with essentially one main task: to produce oil and generate resource rents (Marcel 2006).

Parts of the shared organizational culture can also be negatively related to success, such as organizational cultures with widespread corruption or with dogmatic ideas that constrain necessary changes. Measuring organizational culture would ideally be done through in-depth interviews with all the employees in the state institutions and the NOCs, but this is obviously

not possible within the scope of a thesis. Organizational culture will therefore be measured through investigating the traits that have been identified as crucial cultural traits shared within successful organizations.

Based on the theory of Denison and Mishra (1995), the organizational cultural traits of involvement, adaptability, mission and consistency are expected to positively influence a successful outcome in petroleum sector management. According to Hatch (2013:163) the organizational culture develops in a two-way relationship with its environment. The organizational culture is therefore influenced by the national context from which the members are recruited, but the organizational culture can also influence the world around it (ibid.). Occupational, professional and disciplinal cultures are also important for the development of organizational identity (Hatch 2013:163).

The petroleum sector is large and very complex, and the main hypothesis of this thesis is that the combination of the four traits of organizational culture; involvement, adaptability, mission and consistency has a positive effect on the success in the sector. Moreover, in accordance with Hatch’s (2013) notion of two-way organizational culture development, this thesis sees the organizational culture that is developed in the principal-agent relationship between state and NOC in a two-way relation with the organizational culture developed within the NOC.

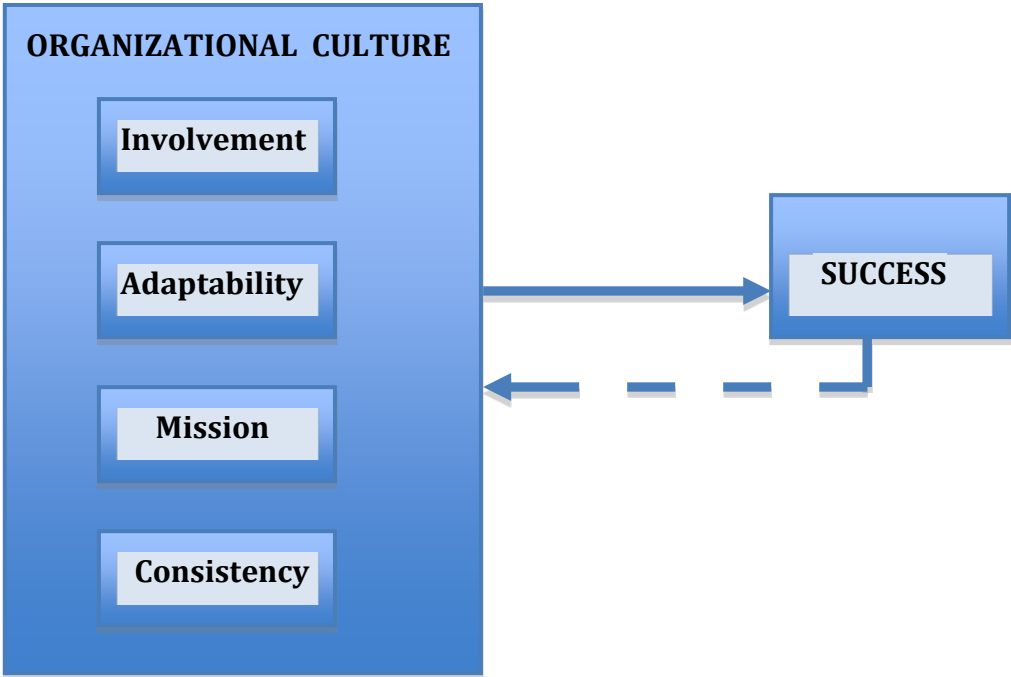


Figure 3.1 Conceptual model

Figure 3.1 presents an illustration of the hypothesized relationship between organizational culture and successful management in the petroleum sector. The hypothesis will be explored through the comparative analysis of the organizational cultures in the petroleum sectors in Norway and Brazil.

4.0 METHODS AND RESEARCH DESIGN

4.1 Measuring organizational culture

Operationalization of variables has to do with the consistency between the definition of a variable and how it is measured. All the four abovementioned traits of organizational culture are rather abstract and will need to be operationalized in order to define what each variable means in the context of this particular study and how it can be measured in order to find the abstract value within the empirical data. In other words the operationalization is a specification of how I will identify whether these traits are dominant in the petroleum sectors in Norway and Brazil.

Most studies of organizational culture are conducted by collecting survey data from the employees in the organization. The studies of Denison and Mishra (1995), Zamanou and Glaser (1994) and Hofstede's (2001:395) studies of organizational culture are mainly using questionnaire and interview data. This thesis will study the organizational culture of the whole petroleum sector in two countries over several years, and a questionnaire survey is therefore not useful for collecting the data I need in this study. The operationalization of the variables will therefore not be as questions in a questionnaire to measure the aggregate answers of the organizations' members, but indicators to be measures qualitatively through secondary and primary data sources. The main data sources will be previous research, official documents and analyses, laws, strategies, statistics and former interviews with informants in the sector.

The indicators are divided between the ones that indicate organizational cultural traits in the principal-agent relationship and the ones that indicate organizational cultural traits within the national oil companies. Since the organizational culture is invisible, as illustrated in the iceberg-model, the indicators are the expected visible demonstrations of the cultural traits.

In table 4.1 the four organizational cultural traits involvement, adaptability, mission and consistency are operationalized with specific indicators for each trait.

Table 4.1 Operationalization of organizational cultural traits in the petroleum sector

Definition of variable	Operational definition	Indicators
<p>Involvement: The organization creates a sense of ownership, responsibility and commitment and the leaders have a high willingness to “include employee contributions in decision making” (Zamanou and Glaser 1994:477).</p>	<p>High involvement: The decisions-making processes are open to all relevant actors within the petroleum sector and professionalism is valued higher than hierarchy. Actors and employees are empowered to make autonomous decisions.</p>	<p>Principal-agent relation: 1-The division of responsibility between the actors 2- Actors involved in state policy decisions 3- Communication and mobility between actors 4- Regulations allow the NOC to make autonomous decisions NOC: 5- Professionalism versus hierarchy 6- Internal mobility 7- Training programs 8- Innovation and pursuit of new ideas</p>
<p>Adaptability: It is “the capacity for internal change in response to external conditions” (Denison and Mishra 1995:215)</p>	<p>High adaptability: The ability to adjust structures, resources, plans and operations according to external challenges such as changes in the market and changes in own resources, as well the ability to foresee new future developments and opportunities.</p>	<p>Principal-agent relation: 1- Restructuring as a response to change 2- Investments 3- Research 4- Risk aversion NOC: 5- Technological development 6- Competitiveness 7- Efficiency 8- Research and development 9- Risk aversion</p>
<p>Mission: “First, a mission provides purpose and meaning, and a host of noneconomic reasons why the organization's work is important. Second, a sense of mission defines the appropriate course of action for the organization and its members” (Denison and Mishra 1995:216).</p>	<p>High mission: All the actors in the petroleum sector share long-term objectives that are kept throughout other changes in the sector and employees are given a sense of purpose through working together towards fulfilling these objectives.</p>	<p>Principal-agent relation: 1- Long-term objectives 2- Both economic and non-economic goals NOC: 3- Overarching strategies and values 4- Goals and objectives</p>
<p>Consistency: It is about normative integration and “the collective definition of behaviors, systems, and meanings in an integrated way” (Denison and Mishra 1995:214).</p>	<p>High consistency: Core values lead employees and leaders in the petroleum sector to make consistent decisions and work in a coordinated manner to reach agreements and coordinate their work to serve the sector as a whole.</p>	<p>Principal-agent relation: 1- Clear communication 2- Clear expectations 3- Shared values NOC: 4- Integration of values and expectations</p>

In order to analyze and compare the organizational cultural traits in the petroleum sectors in Norway and Brazil, it is necessary to measure the scores on each trait. Each indicator will be measured on an ordinal scale with three levels: low, medium, high. Since the traits are abstract concepts, there is a difference in how many indicators that are needed to measure each trait. For each case each of the indicators will be given a score according to the measurement scales presented in table 4.2, and the aggregate score of each organizational cultural trait will be the sum of the indicator scores.

Table 4.2 Measurement of scores on organizational cultural indicators

<u>Variable</u>	<u>Indicator</u>	<u>Measurement</u>
I N V O L V E M E N T	<p><i>Principal-agent relation:</i> 1-The division of responsibility between the actors 2- Actors involved in state policy decisions 3- Communication and mobility between actors 4- Regulations allow the NOC to make autonomous decisions</p> <p><i>NOC:</i> 5- Professionalism versus hierarchy 6- Internal mobility 7- Training programs 8- Innovation and pursuit of new ideas</p>	1- Clear and mutually respected division of responsibility indicated high involvement 2- Consultation with all the actors in the sector before political decisions are made indicates high involvement 3- Common meeting grounds, frequent communication and mobility of staff and leaders between the actors in the sector indicate high involvement 4- It is an indication of high involvement if the NOC can make decision based on professional and not political assessments, and this autonomy is ensured by regulation 5- It is an indication of high involvement if professional opinion is values higher than positions in decision-making 6- Mobility within the company where the employees learn from each other is an indication of high involvement 7- Training programs to further develop professional knowledge and innovation capacity indicated high involvement 8- It is an indicator of high involvement if employees with new ideas are encouraged and allowed to further develop their ideas in the company
A D A P T B I L I T Y	<p><i>Principal-agent relation:</i> 1- Restructuring as a response to change 2- Investments 3- Research 4- Risk aversion</p> <p><i>NOC:</i> 5- Technological development 6- Competitiveness 7- Efficiency 8- Research and development 9- Risk aversion</p>	1- It is an indicator of high adaptability if the sector restructures when the conditions for the current structure change 2- It is an indicator of high adaptability if investments are prioritized in order to understand and prepare for future challenges 3- It is an indicator of high adaptability if research is prioritized in order to understand and prepare for future challenges 4- Low risk aversion of the government is an indicator of high adaptability 5- It is an indicator of high adaptability if new technologies are developed to meet new geological and geographical challenges 6- It is an indicator of high adaptability if the NOC is competitive in relation to other companies in the sector 7- Focus on efficiency improvement indicates high adaptability 8- Focus on research and development indicates high adaptability 9- Low risk aversion of the NOC is an indicator of high adaptability

M I S S I O N	<p>Principal-agent relation:</p> <ol style="list-style-type: none"> 1- Long-term objectives 2- Both economic and non-economic goals <p>NOC:</p> <ol style="list-style-type: none"> 3- Overarching strategies and values 4- Goals and objectives 	<ol style="list-style-type: none"> 1- It is an indicator of high mission if the same long-term goals are kept throughout other changes in the sector 2- That non-economic goals are as important as economic goals indicated high mission 3- That overarching strategies and values are communicated and kept in the NOC indicates high mission 4- It is an indication of high mission if the same goals and objectives guide the NOC at different levels and projects
C O N S I S T E N C Y	<p>Principal-agent relation:</p> <ol style="list-style-type: none"> 1- Clear communication 2- Clear expectations 3- Shared values <p>NOC:</p> <ol style="list-style-type: none"> 4- Integration of values and expectations 	<ol style="list-style-type: none"> 1- It is an indication of high consistency that the communication between the different actors in the sector is open and conflicts of interest are solved before they are allowed to grow 2- It is an indication of high consistency if the expectations from the state actors to the NOC are consistent and clearly communicated 3- If values are shared between actors in the sector this indicates high consistency 4- It is an indicator of high consistency if training programs give clear instructions to employees of the company's expectations and to what the employees can expect from the company. It also indicated high consistency if the company's values are communicated and integrated in all parts of the company

In social sciences the quantitative and the qualitative research traditions have often been regarded as opposites. However, among others King et al. (1994:3) argue that the two traditions have the same logic and the same purpose, but their techniques and styles vary. Method is about data collection in order to answer one or more research questions, and the best method is therefore an answer to what would be the best way to collect data in order to give a valid response to the research question (Eriksson and Kovalainen 2008).

Most research in economics use quantitative methods, especially statistics and models for effect predictions. Much management research on the other hand, uses a combination of quantitative survey methods and qualitative interview data. In the literature of economics and management research, qualitative methods are often seen as just one phase of a study meant to provide better understanding of an issue before applying quantitative methods, or as a provider of a broader understanding of unclear quantitative results (Eriksson and Kovalainen 2008:5-6). Eriksson and Kovalainen (2008:6) disagree with this perspective and argue that qualitative research is an “adequate method for knowledge production, also without any link

to quantitative research”. They defend qualitative method as suitable for much research in economics and business management.

But qualitative research is not one method; qualitative only means that the method does not rely on numerical measurement (King et al. 1994:4). This study of Norway and Brazil is a comparative case study. The petroleum sectors in the two countries are the cases that have been selected as cases of success in the management of the sector. I am interested in explaining this similar success despite the countries’ very different national contexts.

In previous research on petroleum sector management, qualitative methods are often regarded as the most fruitful for the design. For instance the abovementioned studies of Victor et al. (2012) and Kolstad and Wiig (2008) are mainly based on qualitative research methods since the complexity of the petroleum sector and the principal-agent relationship is difficult to analyze with quantitative methods.

4.2 Most different cases

Case studies can be conducted in numerous ways and “should be understood more as a research approach or research strategy rather than a method” (Eriksson and Kovalainen 2008:116). The economist and philosopher John Stuart Mill was one of the first to systematize the qualitative comparison of case countries. He divided comparative studies in two main models, the *method of difference* for studying similar case countries with different values on the variable of interest (the dependent variable), and the *method of agreement* for studying different case countries with similar values on the dependent variable. The method of agreement has later been further developed into the method of *most different systems design*. This method is designed to compare “countries that do not share any common features apart from the outcome to be explained and one or two of the explanatory factors seen to be important for the outcome” (Landman 2003:29).

The above outline of relevant variables shows that the most different systems design is adequate for this comparative study of the petroleum sectors in Norway and Brazil. As shown in section 2, the national context factors that have high scores and are often used to explain success in the petroleum sector in Norway, score much lower in the Brazilian case and can therefore not explain success there in the same way. The political, economic and national cultural contexts that influence success have been quite different in the two countries. The

explanatory factors of organizational culture introduced by management theory are therefore a fruitful contribution to the understanding of the similar outcomes. The matrix of the variables in the most different system is presented in table 4.3.

Table 4.3 Most different systems design

	Norway	Brazil
Explanatory variables		
Political system/Stability	A	E
Economic development	B	F
National culture	C	G
Organizational culture	D	D
Dependent variable		
Success in the petroleum sector	Y	Y

As illustrated in table 3.3, the countries in the most different systems design vary on all the explanatory variables apart from the variable of interest. Norway and Brazil have the same outcome (Y) on the dependent variable. The two cases vary on three of the four explanatory variables, but have similar scores on the fourth variable (D). This supports the hypothesis that D has an effect on Y.

King et al. (1994:134-135) argue that the most different systems design has a selection bias since the same value on the dependent variables is the selection criteria, and it is difficult to demonstrate a causal effect when one will not know whether the explanatory variable is also present in cases where the dependent variable has a different value. Collier (1993:106) on the other hand argues that cases that “differ in terms of key variables that are the focus of analysis” are adequate comparable cases since they allow for concentration on the importance of a few variables. He further argues that the determination of adequate cases depend on the goal of the analysis (Collier 1993:108).

In accordance with George and Bennett (2005:76), this comparative study is a “building block” study that will generate knowledge of the relationship between organizational culture and successful management of the petroleum sector that can be used as a building block in further studies of the same phenomenon. By comparing most different cases with the same outcome, this study identifies an alternative causal path to success (George and Bennett 2005:76).

This requires an in-dept case study and more than two cases are therefore outside the scope, resources and time of this thesis. The finding of this study will have to be applied in a broader study of more cases in order to test the causal effect of organizational culture as an explanatory variable for success, but the current design is nevertheless adequate to answer the exploratory research question of this thesis.

This thesis will be a small contribution to a quite large theory on both petroleum sector and on organizational culture. The studies of petroleum sectors have concluded with explanatory variables for success in Norway that are not present in Brazil and are thus not universally valid explanations. The Brazil case shows that petroleum sector management can succeed without high scores on these variables.

4.3 Validity and reliability concerns

“Validity refers to measuring what we think we are measuring” (King et al. 1994:25). The validity of this study is related to its ability to explain the success in management of the petroleum sectors in Norway and Brazil. I depend on data from previous studies, official documents and statements to get the information needed to answer the research question of this study. I thus depend on the quality of these data sources. In order to ensure the validity of the data in the case studies I use different sources to confirm the information.

In the search, collection and selection of data material, I have used different kinds of sources. I have found quality data in peer-reviewed articles, well-known publications, recent books and statistical reports. I have also used primary sources such as speeches, published interviews and quotes in order to get information from members of the organizational cultures of the petroleum sectors in Norway and Brazil.

Since the concept of organizational culture is abstract, an adequate operationalization of the concept is therefore important in order to have a valid measurement. Through the model and the indicators used to measure organizational culture in the petroleum sector in Norway and Brazil, I have taken care to include the relevant parts of the concepts derived from the theory and developed indicators that in sum operationalizes the concept. Both some of the traits of organizational culture and some of the indicators are correlated. This is inevitable since the cultural aspects and traits do not have sharp divisions between them. Since I analyze the

organizational culture as one concept I do not think that the correlations are a threat to validity.

“Reliability means that applying the same procedure in the same way will always produce the same measure” (King et al. 1994:25). A possible source of threat to reliability is misunderstanding, I have used sources in three different languages; Norwegian, English and Portuguese, and even if I understand all languages well, I may have misunderstood something since they are not my first language. I have consulted native speakers when I have had language doubts in order to diminish this problem. I have also used a copy editor for the thesis in order to express myself better in English.

In the search for data material, I found that much of the information I needed could only be obtained from the ministries or oil companies that I am studying. I have tried to find other sources to confirm their views, but this was difficult in some cases, and there is a chance that some of the data is biased in favor of the version that the source writer wants to present. Some of the previous studies that have been conducted on organizational culture in the oil companies are also classified and I was not able to get insight into all of these. These sources may have increased the reliability of this study, but it is difficult to know.

5 CASE STUDIES

The first part of this section presents the petroleum sectors in Norway and Brazil, measured according to the definition of success given in section 3.1. I then move on to the data findings that measure organizational cultural traits based on the indicators in section 3.4, this is followed by an analysis of organizational culture in each of the two case countries.

5.1 Petroleum success stories

Success in the petroleum sector is measured through a set of indicators, including three success factors; economic success; society’s benefit and control; and attainment of national goals in the sector. A short historical review of the success achievements in the two counties are outlined below.

5.1.1 Norway

The idea of possible petroleum reserves outside the coast of Norway first appeared in the beginning of the 1960s. In 1963 the Norwegian government proclaimed sovereignty over the

Norwegian continental shelf and established that only the government could give concessions to search and extraction. In 1969 the large oil field Ekofisk was discovered and oil production started there in 1971 (NPD 2013a).

Currently the main actors in the petroleum sector in Norway are the Ministry of Petroleum and Energy (MPE) representing the government, the regulator called the Norwegian Petroleum Directorate (NPD) and the national oil company Statoil.

a) Economic success

Growth in the sector

The income of the Norwegian state from the petroleum reserves has varied over the years, and the main income sources have been the petroleum tax, the direct state financial interest (SDFI) and royalties. Since the part-privatization of Statoil in 2001, the dividends from the company are visible as a separate income-source in the graph in figure 5.1.

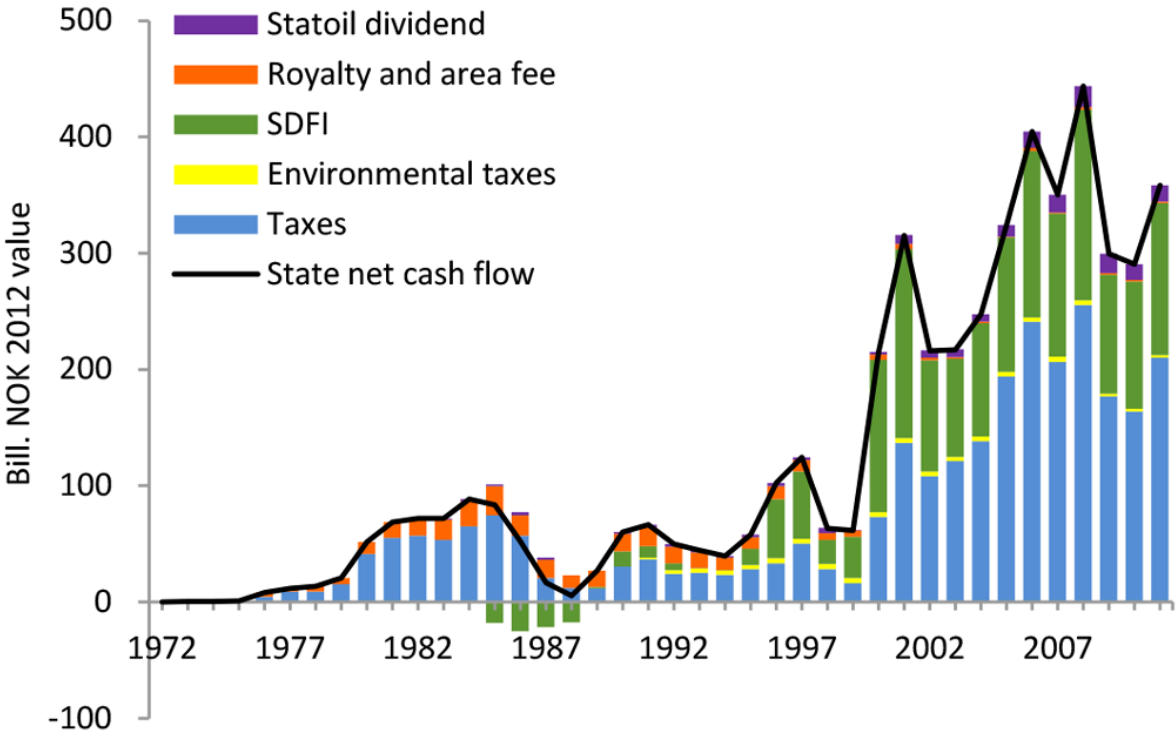


Figure 5.1 Net cash flow to the state from petroleum activities
 Source: NPD 2013a figure 3.4, State accounts

Resource rent generation

The sector has created jobs and the resource rents have been used for welfare and social security to the population, but taxes have been kept relatively high in order to incentivize higher productivity and avoid flooding the economy with rent money (Larsen 2004). A pension fund has been created in order to save the resource rents for future generations (NPD 2010). Currently the market value of the pension fund is 4182 billion Norwegian kroner, including an increase of 366 billion Norwegian kroner the first quarter of 2013 (NBIM 2013).

b) Societal benefit and control

Score on Resource Governance Indicators:

Institutional and legal setting	100
Reporting practices	97
Safeguards and quality control	98
Enabling environment	98
NOC transparency and accountability	99

The scores are measured from 0 to 100 on each indicator, with 100 being the highest score, indicating good-governance. Norway ranks number 1 of a total of 58 resource rich countries that have been analyzed by Revenue Watch (2013).

c) Attainment of main national goals over time

In the beginning the petroleum management sorted under the Ministry of Industry and in 1971 the Industry Committee of the Norwegian Parliament (Stortinget) presented what has become known as the “10 Oil Commandments”, outlining the goals for the Norwegian petroleum sector. These commandments were:

“1) National supervision and control must be ensured for all operations on the NCS (Norwegian continental shelf). 2) Petroleum discoveries must be exploited in a way which makes Norway as independent as possible of others for its supplies of crude oil. 3) New industry will be developed on the basis of petroleum. 4) The development of an oil industry must take necessary account of existing industrial activities and the protection of nature and the environment. 5) Flaring of exploitable gas on the NCS must not be accepted except during brief periods of testing. 6) Petroleum from the NCS must as a general rule be landed in Norway, except in those cases where socio-political considerations dictate a different solution. 7) The state must become involved at all appropriate levels and contribute to a coordination of Norwegian interests in Norway’s petroleum industry as well as the creation of an integrated oil community which sets its sights both nationally and internationally. 8) A state oil company will be

established which can look after the government's commercial interests and pursue appropriate collaboration with domestic and foreign oil interests. 9) A pattern of activities must be selected north of the 62nd parallel which reflects the special socio-political conditions prevailing in that part of the country. 10) Large Norwegian petroleum discoveries could present new tasks for Norway's foreign policy." (NPD 2010)

In 1972 the Norwegian parliament created the regulating Petroleum Directorate (NPD) and the NOC Statoil to fulfill the first goal of supervision and control of NCS. The Ministry of Petroleum and Energy was established in 1978 (NPD 2010). The self-sufficiency goal was attained soon after oil production started and around 200 000 people now work in this new industry in Norway (NPD 2010, Lund 2012). Even though there have been some changes in other productive industries and the current high oil prices put a pressure on Norwegian non-oil exports, the macroeconomic situation with oil income has led to a sound economic development in Norway, also in times when neighboring countries have not had the same opportunity to implement counter-cyclical economic policies (NPD 2010). There is however an increasing conflict between the petroleum interests and the environmental, and especially climate interests in Norway, but the Norwegian oil production is considered to be cleaner and stronger environmentally regulated than similar production in other countries and the regulation against gas flaring has been fulfilled (ibid.).

Landing oil in Norway was difficult to fulfill, but improved technology has fulfilled this goal since the first pipelines to Norwegian harbors in the 1980s. According to NPD (2010) the last four commandments have also been fulfilled through the creation of Statoil and the emergence of Norway as an important oil exporter, linking the sector to other national interests and foreign policy.

5.1.2 Brazil

In 1938 the Brazilian government established a national petroleum council to gain control over the country's petroleum reserves. In 1953 the state oil company Petrobras was created with monopoly rights to oil and gas exploration and production in Brazil. Much of Brazil's petroleum history evolves around and within this company (Fishman 2010). It is difficult to separate the developments in the Brazilian petroleum sector from the developments in Petrobras. The first logo of Petrobras was rhombus shaped with the name of the company in blue on a yellow and green background, a direct link to the Brazilian flag (Petrobras 2013). Currently the main actors in the petroleum sector in Brazil are the Ministry of Mines and

Energy (MME) representing the government, the regulator called the National Agency of Petroleum, Natural Gas and Biofuel (ANP) and the national oil company Petrobras.

a) Economic success

Growth in the sector

According to the American Energy Information Administration (EIA), Brazil has now surpassed Venezuela as South America’s largest liquid fuels producer (EIA 2012). The past decade has brought increasing living standards to millions of Brazilians, so the oil consumption is increase alongside the production, but the new pre-salt offshore fields are expected to increase petroleum exports more than consumption towards 2020, as illustrated in figure 5.2 below.

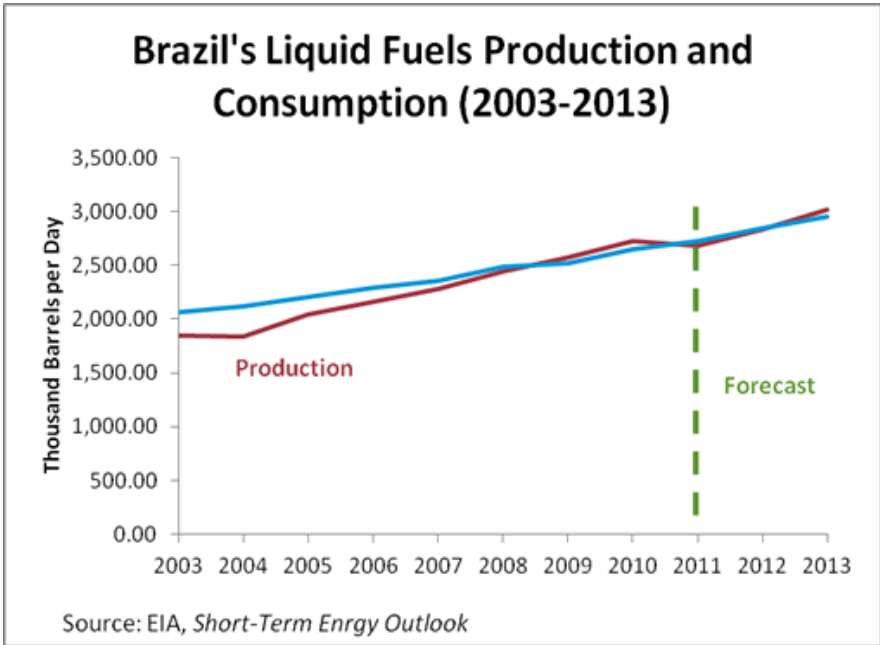


Figure 5.2 Brazil’s liquid fuel production 2003-2013

Source: <http://www.eia.gov/cabs/brazil/Full.html>

Resource rent generation

The income from the royalties in the petroleum sector has increased from just above 2 million BRL in 2001 to 13 million BRL in 2011 (IPB 2013).

b) Societal benefit and control

Score on Resource Governance Indicators:

Institutional and legal setting	81
Reporting practices	78
Safeguards and quality control	96
Enabling environment	66
NOC transparency and accountability	92

The scores are measured from 0 to 100 on each indicator, with 100 being the highest score, indicating good-governance. Brazil ranks number 5 of a total of 58 resource rich countries that have been analyzed by Revenue Watch (2013). All the countries that score better than Brazil are OECD countries. Brazil also scores better than one OECD country; Canada.

c) Attainment of main national goals over time

Self-sufficiency in energy resources has been the main target of the Brazilian petroleum sector since the 1950's (Rodriguez and Suslick 2009:8). This self-sufficiency was linked to the goal of economic growth through industrialization, where reliable and affordable energy played a key role (Sennes and Narciso 2009:27). Both the available oil reserves and the production of oil in Brazil have grown considerably the past 10 to 15 years, and in 2006 Brazil attained an oil surplus for the first time, exporting more oil than it imported (Sennes and Narciso 2009:32-33).

Table 5.1 Summary of success variable

	Success factor	Result
Norway	Economic	Success
	Society's benefit and control	Success
	National goals	Success
Brazil	Economic	Success
	Society's benefit and control	Success
	National goals	Success

5.2 Cultural factors

This section presents the results of the investigation of organizational culture in the petroleum sectors in Norway and Brazil

5.2.1 Norway

a) Involvement

Principal-agent relation:

1-The division of responsibility between the actors

Thurber et al. (2010:7) refers to three distinct government bodies in the administrative design of the petroleum resources in Norway. The Ministry of Petroleum and Energy (MPE) together with the country's political leadership set the goals of the sector. Statoil (NOC) that has the responsibility on commercial activities with an extensive participation in the country and abroad. The Norwegian Petroleum Directorate (NPD) collects fees from the operations of the sector. These three state controlled institutions with their responsibilities and different roles in the sector are known as the "Norwegian Model" of oil sector governance (Thurber et al. 2010).

The Secretary General of MPE, Elisabeth Berge, has worked for both the ministry and Statoil before and after the part-privatization in 2001, and she says the roles and division of responsibilities between the actors have become clearer after the part-privatization (Offshore.no 2009b). According to the current Norwegian Minister of Oil and Energy "Statoil is treated like any other company on the Norwegian Continental Shelf. They have no preferential treatment on the NCS. They apply and compete for licenses and they pay taxes like all other companies" (Moe 2013:5-7). The division of tasks between the main actors in the sector is thus clear and mutually respected.

2- Actors involved in state policy decisions

The Parliament takes the decisions regarding opening of new areas on the Norwegian Continental Shelf for petroleum activities (Moe 2013:3-7). The MPE awards production licenses and approves plans for development, installations and operations of oil and gas fields. The government also approves the decommissioning plans if there are impact assessments and public consultation (ibid.).

According to Boasson (2004:25) the decision-making in the Norwegian petroleum sector has been done in close dialogue between the MPE, NPD and Statoil since the establishment of MPE in 1978. Before new policy decisions are made, economic studies of the policy impact on society and wealth are conducted on behalf of MPE (Thurber and Istad 2012:600-601). The administrative leadership of MPE has been strong and consistent with few changes between shifting governments. This leadership makes policy decisions in close cooperation or negotiation with Statoil and other operating companies (Boasson 2004:37-38).

3- Communication and mobility between actors

The MPE manages the state's shareholder responsibility in Statoil and is active in meetings with the NOC (Moe 2013:6-7). MPE "follows up deliveries in strategy, final and operational results and dividend. There are quarterly one to one meetings with Statoil management. The Ministry is represented in the nomination committee, which proposes members to the non-executive board and the corporate assembly" (Moe 2013:6-7). Statoil is also responsible for informing the government about market and technical issues so the government can make informed decisions about depletion and price (Marcel 2006: 87-88).

There is a relatively high mobility between MPE, NPD and Statoil. Many of the leaders in each institution have been employed in the same institution for many years, but the majority also has experience from other parts of the sector in Norway. For instance has the director of NPD worked as a geologist in Statoil and the secretary general of MPE started her career in the ministry, but has also worked 14 years in Statoil (NPD 2013b, MPE 2012). There has traditionally also been close ties between the Norwegian political parties and the Statoil leadership, the current CEO of Statoil has worked as political advisor for the Conservative party in the Parliament (Statoil 2008). The close dialogue between the actors result in many formal and informal meeting grounds and it is fairly normal to change employer to another actor within the sector (NPD 2013b, Offshore.no 2009b)

4- NOCs allowance to make autonomous decisions

Thurber and Istad (2010) argue that Statoil has had much freedom to make autonomous decisions and prioritize long-term goals without political interventions. After the establishment of MPE in 1978, the Ministry had much direct influence on Statoil's priorities, but throughout the 1980's when Statoil started to make a considerable income, the company gained autonomy (Ryggvik 2010:41) Today Statoil operates as a private company with the

state as majority shareholder, and since the part-privatization in 2001, the government has still suggested and voted on board member, but then mainly trusted the board to make autonomous decisions (Ryggvik 2010, Thurber and Istad 2010).

However, Norwegian politicians and civil society organizations often have opinions on Statoil's decisions and activities, and feel they should have a say in the company's development since they see it as "Norwegian property" (Thurber and Istad 2012:603). Both politicians and public campaigns have stressed the need for a more active ownership by MPE, particularly on controversial issues such as tar-sand developments in Canada and investments in countries with dictatorial regimes, but MPE has so far not intervened in these NOC decisions (ibid.). According to Pargendler et al. (2013:25) among NOCs "Statoil is a unique case in which the board is composed by a majority of external members who are relatively independent from the government".

NOC:

5- Professionalism versus hierarchy

Statoil has since the start had a strong engineering orientation, prioritizing technological developments over short-term income, creating technological breakthroughs and larger income in the long run (Thurber and Istad 2010). Three of the eleven members of Statoil's board are employee representatives (Statoil 2013c), indicating a strong emphasis on including the whole company in decision making processes.

6- Internal mobility

In their own presentation Statoil emphasizes the possibility for internal mobility in the company and also the large possibilities for working in different areas within the Statoil system; both onshore and offshore, in Norway and abroad, in different parts of Norway and in different kinds of projects (Statoil 2013d). There is also internal mobility built into some of the permanent work contracts for professional in Statoil, there is for instance a limit of two years offshore work before an engineer has to return to an onshore job for two years. This is because most of the development and innovation is done onshore, and the company does not want employees to lose contact with this part of the job (personal communication with Statoil engineer).

7- Training programs

Statoil has extensive trainee programs for new employees where they are able to build competence within one area but also gain knowledge of the other different areas Statoil works in (Vilkensen 2006:14). The “Statoil academy” offers training programs for all employees, through this program, employees increase their mobility in the company and are allowed to further develop the knowledge and competence they already have (Statoil 2013d).

8- Innovation and pursuit of new ideas

Statoil has been active in searching for new ideas both within and outside the company, especially the last couple of years. The company has programs, and now webpages, where they announce new challenges and ask for suggested solutions from companies, technological entrepreneurs and research environments. The further development of the projects can then be co-financed by Statoil in venture contracts or with other kinds of development assistance. This is also done within the company with a forum for innovation and new developments (Teknisk Ukeblad 2011, Offshore.no 2011).

b) Adaptability

Principal-agent relation:

1- Restructuring as a response to change

In the beginning of the 1980's Statoil expanded rapidly at the same time as the company directly managed the state's investments. The government thought this gave too much power to the NOC and wanted to stimulate more competition in the Norwegian petroleum sector. In 1984 the state's direct financial interest in the petroleum sector (SDFI) was separated from Statoil in the so-called “Statoil compromise”, this also allowed Statoil to use its remaining profit more freely and invest in downstream broad (Gordon and Stenvoll 2007:12 and 27, Nordeng 2008).

The fall in oil prices in 1985-86 had macroeconomic consequences for Norway. The petroleum tax income to the state was close to zero (see figure 5.1) and the trade balance that had for many years been positive, turned negative from one year to the next (Andersen and Austvik 2000). The unemployment grew and the loss of petroleum income to the state was difficult to recover from other sectors. However, the state kept financing new investments despite economic losses, new concessions were granted and Statoil made considerable efforts

to improve efficiency in exploration and production as well as investing in new technology and development (Boasson 2004:26, Andersen and Austvik 2000).

Towards the end of the 1990's it was clear that the oil production on the Norwegian Continental Shelf would soon reach a peak and start diminishing since the production in the large fields were approaching or past their peak (Nordeng 2008:32). In order to give Statoil increased freedom to pursue investments abroad and to diminish the state's direct risk through direct ownership, the Storting decided to part-privatize Statoil in 2001, keeping 70,9% of the shares under MPE's administration (ibid.).

2- Investments

During the periods of low oil prices in the 1980's, the state kept investing in the domestic oil sector (Andersen and Austvik 2000). Secretary General in MPE, Elisabeth Berge says the separation of Statoil and SDFI probably was a great advantage for the Norwegian petroleum sector when the oil prices fell drastically in 1986. SDFI could invest without constraint, something that would have been difficult if Statoil would still have been the only investor (Offshore.no 2009b). Figure 4.1 also shows a negative income for SDFI in the mid-1980's, confirming Berge's point of view.

The relative financial autonomy of Statoil also allows the company to set outside funds to invest in long term projects, such as research and development or exploration (Pargendler et al. 2013:28).

3- Research

In the beginning of petroleum production in Norway, the government emphasized the need to build knowledge and research within Norway. The international companies that were granted concessions in cooperation with Statoil were given "goodwill points" for involving Norwegian professionals, researchers and supply companies in their work (Sæther et al. 2011).

MPE invests in research on petroleum and energy through giving funding to special research programs in the Norwegian Research Council. This is research within many different disciplines, such as economy, engineering, chemistry, political science and different fields of technology development (MPE 2013).

Through Statoil the state has also invested in carbon capture and storage research and in offshore wind projects. These projects have so far not been very successful, but both the government and the companies involved argue that the investments are research and development investments in a long-term perspective (Offshore.no 2009b).

4- Risk aversion

Apart from the Statfjord field, few large fields were discovered on the Norwegian continental shelf in the 1970's. The young Ministry of Petroleum and Energy then decided to open many new areas for exploration and large concessions were given in 1979, including the still producing fields Oseberg, Troll, Gullfaks and Snorre (Offshore.no 2009a). Much of the economic risk was however transferred to the foreign investors that were partnering with Statoil in the exploration and production.

According to Pargendler et al. (2013) the model of mixed ownership after the part-privatization of Statoil has allowed the government to investment in new and riskier projects with a longer term perspective, since the government can now share risk over uncertain ventures with private investors.

NOC:

5- Technological development

In the 1970's Statoil worked alongside IOCs at the Norwegian Continental Shelf in order to learn as much as possible about exploration and production from the foreign companies. The state gave Statoil financial security to pursue new ideas of innovation and technology, resulting in rapid and ground-breaking technological development (Thurber and Istad 2012:629-637). IOCs are also obliged to use Norwegian technology and have local content in their projects on the NCS (Mendonça 2012:4).

6- Competitiveness

Following the part-privatization in 2001, Statoil started to extensively expand its international programs and investments abroad (Gordon and Stenvall 2007:33). The developments in Norway had slowed down, the company wanted to improve competitiveness and the government agreed with the NOC's suggestion to change the ownership structure to attract private capital and enable expansion (ibid.). Since the large fields on the NCS were becoming

less productive, and the oil production in Norway was expected to decline, Statoil needed to expand abroad in order to continue company growth (Lund 2012).

From the 1970's Statoil had competition from two other Norwegian companies, the private Saga Petroleum and the part-state owned Norsk Hydro⁷. Statoil had the advantages of a NOC, but also had to compete with the other two companies for the best talents and innovation development on the NCS (St.meld. 2011).

In 2007, Statoil merged with the oil and gas branch of Norsk Hydro, this also increased the competitiveness of the company (Lund 2012). According to Thurber and Istad (2012:603) the two companies lobbied the Prime Minister Jens Stoltenberg directly in order to secure the government's acceptance of the merger.

In order to adapt to a more competitive international environment, Statoil expanded its activities to unconventional upstream oil and gas after the merger with Norsk Hydro. At the same time the company split the downstream fuel and retail division into a separate entity, and all Statoil's shares in this entity was sold in 2012 to emphasize the company's focus on upstream (Statoil 2012a).

7- Efficiency

Since Statoil was the preferred company with guaranteed parts in all concessions on the NCS, the efficiency of the company was not thoroughly challenged and Statoil tended to perform less efficiently than its main competitor Norsk Hydro prior to the part-privatization (Thurber and Istad 2012:635). With the exposure to international competition and investments abroad, Statoil improved its efficiency relative to other companies on the NCS (ibid.).

8- Research and development

According to Statoil (2011), the company has a comprehensive research and development activity, focusing on areas that will contribute to fulfilling the ambition of becoming a stronger and internationally more competitive company.

⁷ Saga Petroleum and Norsk Hydro merged in 1999 after Norsk Hydro had bought most of Saga's shares.

Statoil has been a leader in offshore technology and recovery of oil from older fields, this technology development is continuing and has given the company some advantages in international competition (Thurber and Istad 2012:636-637, Statoil 2011).

Statoil has also engaged in several bilateral research cooperation projects with universities and research institutes in Norway. These are focusing on technological innovation, infrastructure development, basic science and research, and co-financing of PhD programs and research projects (Johansen et al. 2009:12-13).

9- Risk aversion

In the start of the petroleum development in Norway, Statoil had 50% participation in all fields and the rest was contracted to a foreign company that had to take all the risk in the project, in this way the risk for both the state and the NOC was minimized (Gordon and Stensvoll 2007:32). Since the part-privatization in 2001, Statoil competes on equal grounds with other companies for concessions in Norway, and also has to bear the same risk. Some of Statoil's investments in projects abroad have been quite risky, and the company has still invested to gain both resource rents and experience. According to the current CEO, Helge Lund (2012), industrial development has inherited many risks for Statoil and some losses have been caused through risk taking, without the willingness to take risks in projects and technology development however, Statoil would not have achieved all that it has achieved.

According to Thurber and Istad (2012: 636), Statoil's initial mandate included developing the Norwegian petroleum knowledge, with technological explorations, high employment and high oil and gas recovery from the fields. This led to less focus on the bottom line in the first decades of Statoil's operations than what was usual in other companies such as Norsk Hydro (ibid.).

c) Mission

Principal-agent relation:

1- Long-term objectives

The overarching mission for the Norwegian petroleum sector for the past 50 years has been that "Norway's petroleum resources belong to the Norwegian people, and they must be managed in a way that benefits the entire Norwegian society" (St.meld. 2011). This goal is

still the first goal highlighted by MPE in the White Paper on the petroleum sector to the Parliament in 2011 (St.meld. 2011). The “ten oil commandments” of the Parliament from 1971 are still incorporated in national strategies for the petroleum sector, so the same overarching goals have been kept throughout the forty years of the sector (St.meld. 2011).

2- Both economic and non-economic goals

According to Thurber and Istad (2010) the Norwegian petroleum policy was from the start in the early 1970s more focused on maintaining state control over the petroleum sector than on maximizing revenue. The “ten oil commandments” are also a mixture of economic and non-economic goals; national control, Norwegian content, environmental concern and self-sufficiency are among the non-economic long-term goals (NPE 2010).

NOC:

3- Overarching strategies and values

The overarching vision of Statoil is “crossing energy frontiers” (Statoil 2013b). The new investments in unconventional tar sands and shale gas and CCS developments are the new frontiers in order to fulfill the vision. The vision is supported by four core values: “courageous, open, hands-on and caring” (Statoil 2013c). Being the best in their area of expertise, such as offshore drilling, health and safety regulations and high degrees of extraction from fields have been goals that Statoil has kept through the years of other changes. This strategy is still important for Statoil and is incorporated in new corporate plans (Statoil 2012b).

4- Goals and objectives

One of Statoil’s main goals has since the start been to ensure maximum value creation on the Norwegian Continental Shelf (annual report 2012). The objective is formulated as a goal to cover the need for energy in order to ensure continued economic and social development, at the same time as the company behaves responsibly and makes an effort to mitigate global climate change (Statoil 2013a). Since the reserves on the NCS are declining it is also a clear goal for Statoil to expand abroad (Nordeng 2008:37).

d) Consistency

Principal-agent relation:

1- Clear communication

In the beginning of petroleum development in Norway the communication between Statoil and the politicians was very strong. The first CEO of Statoil, Arve Johnsen, was a former state secretary for the Labour Party and had strong ties to many politicians in the parliament (Ryggvik 2010:27-33). With the creation of the MPE, the communication between the actors in the sector formalized more, as Statoil also developed a clearer corporate identity (Thurber and Istad 2012:602).

According to Secretary General in MPE, former Statoil employee Elisabeth Berge, the ministry represents knowledge and continuity in the petroleum sector and the communication between the ministry and the other actors in the sector is good and frequent (Offshore.no 2009b).

2- Clear expectations

According to Statoil CEO Helge Lund (2012), the development in the Norwegian petroleum sector has been characterized by a clear division of tasks between the different actors in the sector and clear expectations from the owner interests in the state to Statoil's role as a rent generator.

In the 1980's there was however controversies and politicians said Statoil had too much power in the Parliament (Thurber and Istad 2012:620). This was changed through the establishment of SDFI, and the Parliament's expectation to Statoil became clearer after this separation of Statoil and the state's direct financial interest (ibid.).

3- Shared values

Maximizing the benefit on the Norwegian Continental Shelf and ensuring the Norwegian population best possible profit from their resources has been the shared goal of all the actors in the Norwegian petroleum sector (Thurber and Istad 2012). The development of Norwegian professional resources, national industry and excellence in offshore production has also been shared visions of the Parliament, MPE, NPD and Statoil (Ryggvik 2010, Thurber and Istad 2012, St.meld. 2011, Riis-Johansen 2010).

NOC:

4- Integration of values and expectations

Statoil says they have a value-based performance culture. The four core values of Statoil are “courageous, open, hands-on and caring” (Statoil 2013c). Statoil has an introduction program for all new employees and special programs for leaders and leadership training. All new in the company are trained and followed-up in programs called “you’re one of us” and “people@statoil” (Statoil 2013c). It is clear from the introduction to the values and from the career-model for more experienced personnel that Statoil expects the employees to integrate the core values in their work, but at the same time be innovative and maximize their own potential and performance (Statoil 2013c). The same values are communicated and integrated through programs for newcomers, experienced staff and leaders.

Through the network of institutions and professional in the Statoil academy, the continuity in knowledge-creation and passing on and integration of knowledge in the company is promoted (Statoil 2013d).

Table 5.2 Organizational culture Norway - Summary table

Cultural trait	Indicator score	Total score
Involvement in the principal-agent relationship	1. high 2. high 3. high 4. medium/high	- Both the Norwegian petroleum sector as a whole and Statoil score high on the involvement indicators
Involvement in Statoil	5. high 6. high 7. high 8. high	
Adaptability in the principal-agent relationship	1. high 2. high 3. high 4. medium	- The Norwegian petroleum sector scores high on three of four adaptability indicators, only risk aversion indicated medium adaptability - Statoil scores medium to high on adaptability, the medium score is on risk aversion, and medium to high on efficiency focus
Adaptability in Statoil	5. high 6. high 7. medium/high 8. high 9. medium	
Mission in the principal-agent relationship	1. high 2. high	- Both the Norwegian petroleum sector as a whole and Statoil score high on the mission indicators
Mission in Statoil	3. high 4. high	
Consistency in the principal-agent relationship	1. high 2. medium/high 3. high	- Both the Norwegian petroleum sector as a whole and Statoil score relatively high on the consistency indicators
Consistency in Statoil	4. high	

5.2.2 Organizational culture in the Norwegian petroleum sector

The organizational culture in the Norwegian petroleum sector scores high on mission. This is in contrast to country's score on the long-term orientation factor of national culture, where the Norwegian society scores relatively low. This can be explained by the fact the political system and the economy in Norway were stable and well-functioning when petroleum was found, so the petroleum came on the top of an established welfare system.

The overarching goals of the Norwegian petroleum sector from the start were to develop the sector to the benefit of the people and to be cautious in analyzing the sector's impact on the already functioning welfare economy. This created a high mission-lead culture within the sector; the principal-agent relationship is founded on the common understanding of the mission. The mission-orientation also led the sector to develop a high involvement culture.

In accordance with the mission culture it was important to build a Norwegian knowledge base to ensure that the best interest of the Norwegian people would be prioritized. To develop the sector properly and avoid known pitfalls, a close relationship between the governments and the agent was necessary, and all relevant actors were involved in decision-making. The mandate given to Statoil through the overarching mission also generated high involvement in the company since the petroleum research and development environments in Norway were built up alongside the growth of Statoil, and new innovative and technological personnel were often needed to fulfill the increasing tasks of the company.

The cultural trait of involvement is related to internal challenges and decision-making. Since all the actors in the Norwegian petroleum sector were new and the mobility between them was relatively high, the culture that was built within and between the actors was also high in consistency. It became important to build a strong sector identity, and a strong Statoil identity that were consistent and directed towards fulfilling the goals and challenges of the young sector.

The organizational cultural values of high involvement and high adaptability are in line with the scores of Norway on national cultural dimensions of low risk aversion and low hierarchy. Much of the risk in the Norwegian petroleum development was however shifted to international companies investing in the sector. The high adaptability culture combined with high mission made the managers in the sector able to adapt to shifts in the international

market and in the Norwegian reserve situation at the same time as decisions were made to invest and develop the sector in line with the overarching goals.

Through the state's financial back-up Statoil further developed its adaptability and was in the beginning able to meet external challenges without having to take the cost of the inherent risks and losses of efficiency. To new professional talents Statoil was an interesting place to work since the room for individual development was high. With higher competition in the sector, the state chose to adapt to this through part-privatization of Statoil. The combination of adaptability and consistency in Statoil's organizational culture allowed Statoil to keep a high company identity while expanding abroad, innovating in new areas and attracting cooperation partners both in Norway and abroad.

5.2.3 Brazil

a) Involvement

Principal-agent relation:

1-The division of responsibility between the actors

Until 1997 the Brazilian petroleum sector had two actors; the Ministry of Energy and Mines and the NOC Petrobras. From 1997 the ANP was established as a regulatory agent and the National Energetic Policy Council (CNPE) was established as an energy policy advising council to the government. The regulatory responsibility that used to belong to Petrobras was moved to ANP (Rodriguez and Suslick 2009:11). The ANP and Petrobras are the two actors that are responsible for implementing and carrying out the Brazilian policies for the whole oil and gas supply chain (Prochnik 2011:2). With the establishment of ANP Petrobras was relieved of social and political burdens outside the upstream exploration and production and the division of responsibilities between the actors in the sector became clearer (Victor et al. 2012:900-903). According to de Oliveira (2012:524) it has been important for all actors to keep Petrobras' responsibility strictly to the tasks of an oil company, not giving the company other socio-economic missions. Petrobras has throughout its history had significant control over its allocated resources and been protected from political interventions (Thurber and Hults 2012). The Brazilian Petroleum Law that was renewed in 1997 is very clear and detailed in dividing responsibilities between MME, ANP and Petrobras (Brazil Gov. 1997). The division of responsibilities is thus clear and well respected by all involved parties.

2- Actors involved in state policy decisions

Since the creation of Petrobras in 1954, the communication and cooperation between the company and the government has been close, when state agencies or political parties have demanded changes in the Brazilian petroleum sector, the government has in most cases supported Petrobras' opinion in policies that would affect the NOC (de Oliveira 2012:523-526). However, the various governments during the military regime period often made policy decisions without consulting involved actors, this also happened in the petroleum sector, sometimes, but not always, resulting in inefficient decisions (Guan 2012:5, de Oliveria 2012:528) The energy policy advisory council CNPE created in 1997 consists of representatives from different ministries, one civil society and one university representative and this council advises MME on energy policy matters (MME 2013). CNPE's main task is to maintain national interests within the different energy sectors, and expert advice from relevant stakeholders is often sought in order to develop informed and implementable policies in the petroleum sector, and public hearings open to all stakeholders are held by ANP before new policy decisions, concession regulations and bidding rounds are made (MME 2013, ANP 2011). The different actors' inclusion in the policy decision making process has varied between the political regimes, but during the democratic regimes in the 1990's and 2000's, the involvement of all relevant actors in state policy decision making has been relatively high.

3- Communication and mobility between actors

The personal links between the government, the MME and Petrobras are strong. The CEO of Petrobras is appointed by the government and the current CEO, Maria Foster has previously worked for MME during the current Brazilian President Dilma Rousseff's tenure as Minister of Mines and Energy from 2003 to 2005 (Petrobras Magazine 2013). Before she was appointed the minister post, Rousseff was the head of Petrobras' board of directors. The high mobility between the Brazilian political leadership and the leadership of Petrobras is not new (de Oliveira 2012), and according to Cowley and Magalhaes (2013), analysts see an increase in political interest and influence in Petrobras since the beginning of the 2000's, both the formal and the informal communication seems to be high, but Petrobras still keep a high focus on professionalism in economic and technical decisions.

4- NOCs allowance to make autonomous decisions

When it comes to actions, strategies and decision-making, Petrobras has "reasonable autonomy" in relation to both the MME and ANP according to Sennes and Narciso (2009:40).

Fishman (2010:5) also argues that Petrobras has had “managerial and political independence from the national government”. When the military regime appointed General Geisel to lead Petrobras in 1968, Geisel made it explicit that MME could not interfere in Petrobras’ decision making. However, when Geisel himself became president of Brazil in 1974, he decided that Petrobras had to cooperate with international oil companies to explore the newly found Brazilian offshore oil fields; this was implemented even if Petrobras was against the idea (de Oliveira 2012:525-528). Petrobras’ allowance to make autonomous decisions has thus varied, but it has mainly been relatively high and currently the autonomy is high.

NOC:

5- Professionalism versus hierarchy

Petrobras has from the start been focused on attracting skilled employees, especially professionals within technology, geology and chemical engineering (de Oliveira 2012:523). The board of directors of Petrobras has one member that represents the employees (Petrobras 2013). This indicates involvement of employees at all levels of the company. Petrobras was created before Brazil had discovered large oil reserves, and the need to develop professional skills and include technical expertise in decision-making has therefore been necessary to the performance and growth of the company (de Oliveira 2012).

6- Internal mobility

Petrobras has a strong national identity and hires mainly Brazilian employees, the internal mobility possibilities for employees in Petrobras is higher than what is usual in Brazilian companies, especially state-owned companies, but lower than the mobility in other private companies when compared to IOCs that work in the Brazilian petroleum sector (Abreu et al. 2013:19). The current CEO of Petrobras, Maria das Graças Silva Foster holds degrees in both chemical engineering and economics, she has worked for Petrobras for 31 years and she has also worked for MME, this indicates that mobility through promotions is possible in the company (Petrobras Magazine 2012).

7- Training programs

In the early years Petrobras’ employees were trained abroad by foreign professionals. The focus on professionalism and training was high; the best graduates from Brazilian universities were employed by Petrobras, a selection based on merit and not on personal connection (de Oliveira 2012:522-523). Petrobras offers comprehensive training programs to all new

employees, there is a Petrobras University in three Brazilian states for training of personnel, there are also training, courses and promotion possibilities for experienced employees (Petrobras 2013).

8- Innovation and pursuit of new ideas

It is emphasised by Petrobras that employees have the opportunity to be creative and to develop their professional skills through research and development within the company (Petrobras 2013). “Entrepreneurship and innovation” is one of Petrobras’ core values (Petrobras 2013). Petrobras’ first oil fields were onshore in Brazil and rather limited, so the need to search and explore new fields offshore has made the company very open to technical innovations and investments in creativity among the employees (de Oliveira 2012).

b) Adaptability

Principal-agent relation:

1- Restructuring as a response to changes

From the start in 1953 Petrobras had monopoly in the Brazilian petroleum sector and was responsible for commercial, policy-related and regulatory issues (Thurber et al. 2011:9). After having built human and institutional capital within Petrobras and the NOC had grown to a robust company, the government restructured in order to prevent the NOC becoming a “state within the state” by removing Petrobras’ monopoly and creating ANP as a regulatory agent in 1997 (Thurber et al. 2011:10, Rodriguez and Suslick 2009:11).

Even though the 1988 constitution consolidated Petrobras’ monopoly, a constitutional amendment from 1995 made part-privatization of Petrobras possible and allowed participation of national and international capital in the petroleum sector. This also allowed Petrobras to engage in joint ventures and invest and operate abroad (Sennes and Narciso 2009:40).

In the 1975 Brazil was dependent on oil imports and the oil prices were high. Increased petroleum exploration in Brazil was expensive since the reserves were in geologically challenging locations. The government then decided to allow risk contracts where international oil companies were allowed to partner with Petrobras and pay for the risky explorations, and they would then split the finding with Petrobras if oil was found (Baer 2008:189).

2- Investments

From the beginning Petrobras received substantial help from the state in form of tax reductions, finances and favorable regulations in order to develop competence and capacity to produce petroleum domestically and reduce Brazil's dependence on energy imports (de Oliveira 2012:548-549). Since the goal of self-sufficiency has been guiding in Brazilian energy policy, the government kept investments in Petrobras high in order to expand the domestic oil production in Brazil, this gave Petrobras a continued opportunity to explore new areas and technologies (Guan 2010:81-82)

3- Research

After the creation of a national oil company Brazilian universities were encouraged to establish and offer studies within geology, engineering, management and technology in order to build a solid Brazilian professional research environment in petroleum related disciplines (de Oliveira 2012:523). The state funding of petroleum research is mainly channelled through Petrobras, and the NOC has cooperation agreements with a number of state universities, focused on educating Brazilians to develop solutions for the future of the Brazilian petroleum sector (Mansoori et al. 2001:74-75). The Brazilian government, MME and Petrobras have since the beginning been reluctant to let foreigners into the sector and investments in domestic education and research has been a priority (ibid.).

4- Risk aversion

Since the Brazilian government prioritized national control of the petroleum resources and increased production of oil to better oil self-sufficiency over commercial economic goals, the government allowed Petrobras to take risks in the investments and exploration in the sector and exercised little detailed control of the decisions made by the NOC (Thurber and Hults 2012). The Brazilian oil reserves are not easily accessible, and MME has been willing to allow and invest in high risk projects in order to develop the necessary deep-water technology (Guan 2010).

NOC:

5- Technological development

Petrobras has continuously developed its technology to operate in deeper and deeper waters off the Brazilian coast and is currently one of the world leaders in deepwater oil production (Thurber and Hults 2012).

Even though Brazil has discovered large new reserves of oil and gas, the country depends on imports of gas from Bolivia to cover almost one third of its natural gas needs. When Bolivia nationalized its gas sector in 2005, Petrobras saw it as a threat to gas supply in Brazil and launched several new projects. The main project was to invest heavily in gas exploration and production in Brazil, but also in regasification technology to improve the possibility to import LNG from overseas (Sennes and Narciso 2009:36).

6- Competitiveness

Petrobras is among the largest energy companies in the world and tops the ranking of the most valuable brands in Latin America (Denis 2012). Petrobras has since the 1990's been considered a world leading company in deepwater and ultra-deep offshore petroleum exploration and production (Fishman 2012:5). With the end of the monopoly Petrobras also had to compete with other companies for the best employees. According to Abreu et al. (2013:19) Petrobras was able to adapt to this new competition relatively well through offering job security, new training programs and other benefits to keep experienced staff and attract the best of the new talents.

7- Efficiency

Due to fixed price payments from the state and the monopoly situation of Petrobras until 1997, the company grew overstaffed and relatively inefficient compared to private oil companies (Fishman 2010:4). The government found too many human resources within the petroleum sector to be tied up in Petrobras, and ordered the company to change the policy from stable, permanent positions to more contract hiring (Abreu 2013:2). The Petrobras workforce steadily declined after this, from more than 50 000 in 1994, to just above 30 000 in 2001, at the same time a strategy to increase efficiency and innovation was implemented (ibid.). The productivity of Petrobras did not decline however, the number of barrels of oil produced daily increased while the number of employees declined (Abreu 2013:2). Among peer NOCs and IOCs Petrobras is now considered to be very efficient and well-managed (de Oliveira 2012:515).

8- Research and development

In 1968 Petrobras opened the Cenpes research center to meet the technological demands of the company. Cenpes soon became the largest research center in Latin America and the research led Petrobras to become one of the world leading companies within petroleum technology and an important patent holder (Petrobras 2013). Cenpes is “engaged in research

activities in almost all areas of petroleum production operations and is widely known for its innovations in petroleum drilling in deep water reaching record depths” (Mansoori et al. 2001:74). “Readiness to change” is also one of Petrobras’ ten core values (Petrobras 2013).

9- Risk aversion

Through Petrobras’ monopoly the NOC could shift its risk in exploration and production over to the Brazilian state and oil consumers (Thurber and Hults 2012). Petrobras also took risks in order to explore new areas, especially the expansion to overseas investments in the 1970’s were risky, but the company still went through with the projects and was able to expand its experience and knowledge (de Oliveira 2012:527).

c) Mission

Principal-agent relation:

1- Long-term objectives

The main objectives in the petroleum sector for the Brazilian governments since the creation of Petrobras in 1954 has been national control of the oil reserves and self-sufficiency in oil supply (Rodriguez and Suslick 2009:8, Sennes and Narciso 2009:27, Baer 2008:217). These main objectives have throughout the years guided all the political decisions for the sector, regardless of political regime. These objectives have been characterized as national interests and in cases of disagreement between the actors in the sector, the governments have made the decisions they found to be in accordance with the national interests (de Oliveira 2012, Guan 2010).

2- Both economic and non-economic goals

The long-term objectives outlined above have both economic and non-economic, more ideological aspects. The development of the petroleum sector in Brazil has been closely connected to the goal of national sovereignty and independence and the development of petroleum sector capacity, professionals and national content have been important goals from the start, and have been integrated in the decision making of MME, Petrobras and later ANP (Guan 2010, de Oliveira 2012).

NOC:

3- Overarching strategies and values

“Integrated growth, profitability and socio-environmental responsibility” are the keywords of Petrobras’ corporate strategy (Petrobras 2013). Petrobras also has ten core values. Some of them are related to economic performance, growth and productivity, while others are non-economic such as diversity, sustainable development and respect for life (ibid.).

4- Goals and objectives

Petrobras has often worked with concrete future goals such as the goal to reach production of 500 000 barrels a day within 1985 (de Oliveira 2012:533). Currently, the company has a vision for 2020 to be one among the world’s five largest integrated energy companies and the preferred choice of stakeholders (Petrobras 2013). These overarching goals are communicated throughout the company, and in times of external stress and change, such as the instable economic and political situation in Brazil in the mid-1980, the goals are maintained and constitute a guideline for the employees (de Oliveira 2012:533).

d) Consistency

Principal-agent relation:

1- Clear communication

The communication between MME, ANP and Petrobras is frequent and open. The Brazilian petroleum law clearly outlines the national objectives in the petroleum sector and the actors in the sector all share these objectives and work in dialogue to fulfill them (Brazil Gov. 1997, de Oliveira 2012). In conflicts of interest between MME and Petrobras, MME has made decisions based on the national objectives and Petrobras has been loyal in implementing decisions (Abreu et al. 2013, de Oliveira 2012).

2- Clear expectations

The Petroleum law outlines the National Congress’ expectations to all the actors in the petroleum sector in Brazil. There is a clear focus on national development where the roles of MME, ANP and Petrobras are clearly outlined (Brazil Gov. 1997). The CEO of Petrobras is in close dialogue with the government, and also communicates Petrobras’ expectations back to MME (de Oliveira 2012, Cowley and Magalhaes 2013).

3- Shared values

The Brazilian petroleum sector, from MME, through ANP and Petrobras to the different oil platforms and gasoline stations has always been linked to the Brazilian national feeling of

independent development. The sector has had an important economic and symbolic role in the larger Brazilian national project and the different actors in the sector have depended on each other, but have also shared the acknowledgment that their commitment made a difference for the country (de Oliveira 2012, Abreu et al. 2013).

NOC:

4- Integration of values and expectations

Through training programs for all new employees the core values of Petrobras are communicated and segmented throughout the company. The core values include “integration” and “proud to be Petrobras”, indicating a strong focus on creating a company identity and cooperation among employees, the shared values of all the employees are called the “intangible assets” of the company (Petrobras 2013). The values also emphasize the pride in being a Brazilian company, linking the company’s performance to national development (ibid.). In 2009 Petrobras scored the maximum 100 points in human capital development on the Dow Jones Sustainability index (Abreu 2013:2).

Table 5.3 Organizational culture Brazil - Summary table

Cultural trait	Indicator score	Total score
Involvement in the principal-agent relationship	1. high 2. medium/high 3. medium/high 4. high	- The Brazilian petroleum sector scores medium to high on involvement.
Involvement in Petrobras	5. high 6. medium 7. high 8. high	- Petrobras scores high on three of four involvement indicators, only the internal mobility indicates lower involvement in Petrobras.
Adaptability in the principal-agent relationship	1. high 2. high 3. high 4. high	- The Brazilian petroleum sector scores high on all adaptability indicators.
Adaptability in Petrobras	5. high 6. high 7. medium 8. high 9. medium	- Petrobras scores medium to high on adaptability, the medium scores are on efficiency focus and risk aversion

Mission in the principal-agent relationship	1. high 2. high	- Both the Brazilian petroleum sector as a whole and Petrobras score high on the mission indicators
Mission in Petrobras	3. high 4. high	
Consistency in the principal-agent relationship	1. high 2. high 3. high	- Both the Brazilian petroleum sector as a whole and Petrobras score high on the consistency indicators
Consistency in Petrobras	4. high	

5.2.4 Organizational culture in the Brazilian petroleum sector

It is difficult to completely separate the principal and the agent in the Brazilian petroleum sector. The ties between the leadership in Petrobras and the Brazilian political elite have been strong from the start and it is therefore not surprising that the involvement factor in the organizational culture in the petroleum sector is high. The development of the Brazilian petroleum sector has been a national project where the cooperation between the state as the principal and Petrobras as the agent, has been crucial for advancement.

The cultural trait of high involvement in both the sector as a whole and within Petrobras is nevertheless somewhat contrary to the previous studies of national culture in Brazil, where the national culture results to be hierarchical and scores low on individualism. An explanation of this difference between the culture in the petroleum sector and in the society as a whole can be that the sector has been created from scratch with emphasis on the creation of strong professional bases in Brazil. The goal of self-sufficiency has guided the cultural development in the new sector towards innovation and emphasis on fostering the best professionals to make the best possible technical solutions, regardless of their hierarchical position.

The high mission oriented culture combined with resources located in geologically challenging places, has in this way encouraged a culture of high involvement. It was clear from the start that politicians could not decide to attain the national goals without involving professional from the petroleum company in decision-making and giving them autonomy to make adequate decisions for development.

Even though the political and economic situations were often unstable in Brazil until the mid-1990's, the organizational culture in the petroleum sector scores high on both mission and consistency. These cultural traits are in accordance with the national cultural trait of long-term

orientation, and long-term overarching goals were combined with more concrete short-term goals for Petrobras to fulfill on behalf of the government. Petrobras has own company values that are consistent throughout the company, but these values are also well connected to the political goals for the whole sector, this has also continued after the part-privatization.

The organizational culture in the sector nevertheless also scores high on adaptability. The Ministry of Mines and Energy kept investing in Petrobras to meet new challenges caused by changes in society, volatile oil prices and geological difficulties. The mission of enhancing Brazilian national development did not hinder Petrobras from investing abroad and increasing its adaptability through technological developments. The solution to part-privatize Petrobras was a combination of high mission and high adaptability culture. Brazil had to liberalize its economy in the 1990's to meet the debt and low economic performance inherited from the 1980's. However, due to the strong mission culture within the petroleum sector, Petrobras was one of the very few state-owned companies that were not fully privatized in the 1990's.

6. COMPARATIVE ANALYSIS

Through the analysis of the indicators of high involvement, high adaptability, high mission and high consistency in the petroleum sectors in Norway and Brazil, I have found that both the two sectors, with emphasis on the principal-agent relationship, and the two national oil companies Statoil and Petrobras, have organizational cultures that score high or medium to high on all the four cultural traits.

The organizational culture of the principal-agent relationship and the organizational culture in the national oil companies have developed simultaneously and are overlapping and interdependent. Even though the companies Statoil and Petrobras have their own organizational cultures, their cultures have developed as answers to the mission the companies were given by the governments.

Both in Norway and in Brazil the overarching goal of national control of the petroleum sector have guided the management decisions in the sector and included the sector in the larger national development plans. In Norway the petroleum sector was included in the plan to maintain and strengthening the welfare state, and the research experience, industrial and technological development and infrastructure the Norwegian people could gain from the sector was just as important as the resource rents. In Brazil the petroleum sector development

was one part of the puzzle for industrialization and modernization of the country. A high mission culture thus already existed in both sectors and companies from the beginning.

As table 2.1 in section 2 shows, the cultural trait of mission is oriented towards a stable direction for the organization to deal with external challenges. It is therefore somewhat surprising that this cultural trait is closely connected to the internal oriented high involvement in both petroleum sectors and NOCs in Norway and Brazil. The overarching non-economic missions that were guiding the Norwegian and the Brazilian sectors and their NOCs, in both cases had involvement of actors and professionalism in decision-making inherited in them, the missions were not accomplishable without a high involvement organizational culture. An organizational culture that combines the traits of external oriented high mission and internal oriented high involvement has thus enhanced the possibility of success in petroleum sector management in both Norway and Brazil.

One of the goals for the governments was the continued national control of the sector, and this depended on the survival of Statoil and Petrobras. The petroleum sectors in both Norway and Brazil score somewhat higher than the oil companies when it comes to adaptability. Both Statoil and Petrobras have their lowest scores here. Looking at the score on the indicators it is efficiency focus and risk aversion that have medium score for both companies, and these indicator had lower scores before the part-privatizations than they have currently.

Adaptability costs to external changes that could harm the companies were taken by the government in order to shield the companies and allow them to grow also at times when they might not have grown, or even survived if they had been exposed to full market competition. This changed when the adaptability within Statoil and Petrobras was high enough for the companies to meet external challenges in competition with other companies. Both Statoil and Petrobras scored high on adaptability at the time they were part-privatized. The governments also adapted to the new situation of large oil companies that needed to invest abroad in order to continue growing, and the part-privatizations are also signs of the sector's adaptive capacity. High adaptability has been important for the ability to succeed in petroleum management in Norway and Brazil, first for the principal-agent relationship, and later for the national oil companies.

To ensure high consistency is one of the reasons for creating a NOC in the first place. Other oil companies could have done the agent role for the state, but the state wants an agent that is built on the values that benefit the state's goals for the sector. According to Marcel (2006), the

petroleum sector is a high prestige sector in most societies. The best professionals are recruited to the national oil companies and these NOCs often represent a national pride among employees, but also in the society in general. This was also the case in Norway and Brazil, although in contrast to some of the countries in Marcel's (2006) study, Statoil and Petrobras were not the only large industrial companies in their countries and they had some competition from other companies and sectors for the best talents.

Nevertheless, high consistency throughout the sector and the NOCs was probably already a part of the organizational cultures from the start, aided by the high mission. To keep consistency high over time could be a larger challenge since the principal and the agent can develop different interests and also new, smaller principal-agent relationships emerge within institutions and companies when the sector grows.

The close relationships and quite high mobility between the leaders of the energy ministries and the leaders of the NOCs have probably kept the consistency in the principal-agent relationship high in both countries and this has had a positive effect on success. Within Statoil the combination of high involvement and high consistency has given the employees meaningful common values and goals for cooperation combined with opportunities to follow individual ideas and careers within the company. This has been important in order to attain success in a national culture that highly values individuality.

In Petrobras the high consistency is linked to the pride of working for a company that contributes to the national development. Individuality and mobility has traditionally scored low in the Brazilian society, and Petrobras has offered a secure and well-paid workplace with larger possibilities for personal professional development than many other Brazilian companies (Abreu et al. 2013). High consistency in Petrobras is therefore less dependent on high involvement than the case is for Statoil, but the high consistency in Petrobras has been important in order to attain success in the petroleum sector.

The combination of the four organizational cultural traits in the petroleum sectors and NOCs in Norway and Brazil supports the hypothesis presented in figure 3.1 that all the four traits are necessary for success.

7. CONCLUSION

In this thesis I have studied the petroleum sectors in Norway and Brazil in order to understand why both these countries have been successful in their petroleum management. I have used a comparative method based on a selection of two most different cases. Norway has a national context that is favorable to success and Brazil does not, yet both have succeeded in petroleum management.

This thesis has aimed to answer the exploratory research question of how an analysis of organizational cultural factors contribute to a better understanding and explanation of success in the petroleum sector management in Norway and Brazil. Through the two cases studies, I have analyzed the organizational culture in the petroleum sector in both countries with the aim of exploring whether this explanatory variable explains the similar success outcome in both countries. The hypothesis that a strong organizational culture positively influences success in the management of the petroleum sector has been strengthened through this study.

The analysis of organizational cultural factors in the petroleum sectors in the two case countries has contributed to the understanding of how the states' petroleum ministries and the NOCs have developed together, and been interdependent in order to develop the successful management. By looking behind the formal structures and analyzing the cultural traits that are the fundament for decision-making and actions in the sectors, I have found similarities between the petroleum sectors in Norway and Brazil that can explain why the sectors have both been successful despite the differences between the countries on other explanatory variables.

I have found that the four organizational cultural traits; involvement, adaptability, mission and consistency are dependent on each other and enhance each other in the petroleum sectors in both Norway and Brazil. The cultural traits below the visible surface of actions and artifacts are difficult to measure in a definite way. Culture is also a changing phenomenon and cultural traits can become stronger or weaker with time. In this thesis I have measured the cultural traits through analyzing available data sources, and the findings in this thesis can be used as a building block for further studies of the relationship between organizational culture and success in petroleum rich countries.

In the literature on the resource curse, the principal-agent relationship plays an important role. The findings in this thesis show that organizational cultural factors can explain how interdependent the principal and the agent are in the petroleum sector. Both case countries found a balance between the principal's control of the agent and the agent's independence to develop and grow. The creation of non-economic missions and goals for the petroleum sector strengthened the development of a shared organizational culture in the principal-agent relationship. This finding could also be interesting for other resource rich countries that want to diminish asymmetric information through creating a NOC, and also want the NOC to develop into a loyal, as well as independent, internationally competitive company in the long-term.

Even though the same organizational cultural traits can be identified as high in both Norway and Brazil, there are some differences between the countries, differences that can also be related to the national cultural traits of the countries. It is therefore possible that the organizational cultural traits emphasized in this thesis are related to success in a different way in other resource rich countries. As mentioned in the background chapter, the study of culture as a phenomenon has also been debated in the literature, and since culture has an abstract nature that by definition mingles with everything, it can be difficult to distinguish cultural traits from other explanatory variables, or to define the cultural traits within social practice. The qualitative approach of this thesis has made it possible to identify organizational cultural traits in the petroleum sectors in both Norway and Brazil, but a larger study with supplements of both more in-depth qualitative methods and quantitative methods could be useful in order to strengthen and improve the arguments in this thesis.

However, since the same traits of organizational culture can explain the success in the petroleum sectors in countries as different as Norway and Brazil, it is reasonable to believe that they would be positive for success also in other petroleum rich countries. Similar results from only two case countries is however not enough to be able to generalize the results to a larger universe of cases, this would have to be empirically tested in more case countries. The results in this thesis can also be a building block for generating variables for a statistical analysis of the relationship between organizational culture and success in a large sample of cases.

This thesis has demonstrated that is useful to use the theory of organizational culture to better understand and explain the similar outcome of success in the management of petroleum resources in Norway and Brazil. The use of this theory in further theory development within the field of natural resource management can therefore be useful for future research that aims to understand successful outcomes in resource rich countries.

8. REFERENCES

Abreu, Mônica Cavalcanti Sá, Maria Cristiane Cunha and Silvia Maria Pedro Reboucas 2013. "Effects of personal characteristics on organizational commitment: evidence from Brazil's oil and gas industry", pp. 1-22 in *The International Journal of Human Resource Management*, Routledge

Al-Kasim, Farouk, Tina Søreide and Aled Williams 2013. "Corruption and reduced oil production: An additional resource curse factor?" pp. 137-147 in *Energy Policy* 54. Elsevier Ltd.

Andersen, Svein S. and Ole Gunnar Austvik 2000. Nasjonal handlefrihet - nye internasjonale rammebetingelser. Petroleum, makt og demokrati. Report 21, November 2000. *Makt- og demokratiutredningens rapportserie*. Available online through URL: http://www.sv.uio.no/mutr/publikasjoner/rapp2000/Rapport21.html#_Toc499085379

ANP 2011. *Public hearing No 12/2011, Brasil rounds*, ANP homepage. Available online through URL: <http://www.anp.gov.br/brasilrounds/ingles/Noticias.asp>

Antal, Ariane Berthoin and Victor J. Friedman 2008. "Learning To Negotiate Reality: a Strategy for Teaching Intercultural Competencies" pp. 363-386 in *Journal of Management Education* 32, Sage Publications

Baer, Werner 2008. *The Brazilian Economy – Growth and Development*, sixth edition. Boulder: Lynne Rienner Publishers

Bang, Henning 1998. *Organisasjonskultur i praksis – Verktøy for kartlegging, utvikling og endring av organisasjonskultur*. Oslo: Tano Aschehoug

Boasson, Elin Lerum 2005. "Klimaskapte beslutningsendringer? En analyse av klimahensyn i petroleumspolitiske beslutningsprosesser". Master thesis, Department of Political Science, University of Oslo

Brazil Gov. 1997. Petroleum Law, lei nº 9.478, de 6 de agosto de 1997.

CIA World factbook 2013. <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>

Collier, David 1993. "The comparative method" pp. 69-84 in Finifter, A.W. (ed.) *Political Science; The state of the discipline, II*. Washington, DC: American Political Science Association

Cowley and Magalhaes 2013. "Petrobras CEO's Grasp of Challenges Earns Praise", Wall Street Journal, published 23 May 2013. Available online through URL: <http://online.wsj.com/article/SB10001424127887323398204578484972425348306.html#articleTabs%3Darticle>

Dahl, Stephan 2004. "Intercultural Research: The Current State of Knowledge", Middlesex University Discussion Paper No. 26

da Motta, Ronaldo Seroa, Amanda Aragão and Jacqueline Mariano 2008. Hydrocarbons in Latin America – Case of Brazil, report final version1, Research Institute for Applied Economics, Rio de Janeiro

de Oliveira, Adilson 2012. "Ch. 12. Brazil's Petrobras: strategy and performance" pp. 515-556 in Victor, David G., David R. Hults and Mark Thurber (eds.) 2012. *Oil and Governance – State-owned enterprises and the world energy supply*. Cambridge: Cambridge University press

Denis, Elizabeth Gasiorowski 2012. "Exclusive interview with Maria das Graças Silva Foster, Petrobras CEO", interview with Maria Foster, published 19 November 2012. Available through URL:
http://www.iso.org/iso/home/news_index/news_archive/news.htm?refid=Ref1678

Denison, Daniel R and Aneil K Mishra 1995. "Towards a theory of organizational culture and effectiveness" pp. 204-223 in *Organizational Science* vol. 6 no. 2. Informs

EIA 2012 U.S Energy Information Administration. Available online through URL:
<http://www.eia.gov/cabs/brazil/Full.html>

Eifert, Benn, Alan Gelb and Nils Borje Tallroth 2002. *The political economy of fiscal policy and economic management in oil exporting countries*, World Bank Policy Research Working Paper 2899

Eriksson, Päivi and Anne Kovalainen 2008. *Qualitative methods in business research*. Sage Publications

Fishman, Andrew 2010. Petroleum in Brazil – Petrobras, Petro-sal, legislative changes and the role of foreign investment. Working paper December 2010. Center for Latin American Issues, George Washington University – Washington DC

Gatley, Stephen, Ronnie Lessem and Yochanan Altman 1996. *Comparative management – A transcultural odyssey*. Berkshire: McGraw-Hill book company

George, Alexander and Andrew Bennett 2005. *Case studies and theory development in the social sciences*. Cambridge: MIT Press

Gordon, Richard and Thomas Stenvoll 2007. *Statoil: A study in political entrepreneurship, policy report*, James A. Baker III Institute for Public Policy of Rice University

Guan, Erjia Joy 2012. "Understanding Brazil's oil industry: Policy dynamics and self-sufficiency" pp. 77-98 in *Journal of Emerging Knowledge on Emerging Markets*, vol. 2, ICA Institute Publication

Guirauden, Denis 2007. "Ch.5: Legal, fiscal and contractual framework" pp.179-218 in *Oil and gas exploration and production – reserves, costs, contracts*. Paris: IFP publications

Hatch, Mary Jo 2013. *Organization theory – Modern, symbolic, and postmodern perspectives*, third edition. Oxford: Oxford University Press

Hodgson, Geoffrey M. 2006. "What are institutions?" pp. 1-25 in *Journal of Economic Issues* vol. XL no. 1.

Hofstede, Geert 2001. *Culture's consequences – Comparing values, behaviors, institutions and organizations across nations, second edition*. Thousand Oaks: Sage Publications

Hofstede, Geert 2013. The Hofstede Centre website. Norway: <http://geert-hofstede.com/norway.html> Brazil: <http://geert-hofstede.com/brazil.html>

Hults, David R. 2012. “Ch. 3. Hybrid governance: state management of national oil companies” pp. 62-120 in Victor, David G., David R. Hults and Mark Thurber (eds.) 2012. *Oil and Governance – State-owned enterprises and the world energy supply*. Cambridge: Cambridge University press

Humphrey, Macartan, Jeffrey D. Sachs and Joseph E. Stiglitz (eds.) 2007. *Escaping the resource curse*. New York: Columbia University Press

IBP 2013. “Informações e estatísticas da indústria”, statistics published by Instituto Brasileiro de petróleo, gás e biocombustíveis. Available online through URL: <http://200.189.102.61/siee>

Johansen, Geir Anton, Astrid Bårdgard, Anders Haugland and Rolf Middeltun-Moe 2009. “Bridge over Troubled Water - veien fra akademia til industri - og tilbake”, report from seminar on research-driven innovation in Bergen, 8 December 2009

Karl, Terry Lynn 1999. “The perils of the petro-state: reflections on the paradox of plenty” pp. 31-48 in *Journal of International affairs* vol. 53 no.1. New York: Columbia University

Khalil, Elias L. 1995. “Organizations versus institutions” pp. 445-466 in *Journal of Institutional and Theoretical Economics (JITE)* vol. 151, no. 3. Mohr Siebeck GmbH & co

King, Gary, Robert O. Keohane and Sidney Verba 1994. *Designing Social Inquiry – Scientific Inference in Qualitative Research*. Princeton: Princeton University Press

Kolstad, Ivar and Arne Wiig 2008. “Political economy models of the resource curse: Implications for policy and research”, CMI working paper 2008:6. CMI:Bergen

Kolstad, Ivar, Arne Wiig and Aled Williams 2009. “Mission improbable: Does petroleum-related aid address the resource curse?” pp. 954-065 in *Energy Policy* 37. Elsevier Ltd.

Landman, Todd 2003. *Issues and methods in comparative politics – An introduction, second edition*. London: Routledge

Larsen, Erling Røed 2004. *Escaping the resource curse and the Dutch disease? When and why Norway caught up with and forged ahead of its neighbors*, Discussion paper No. 377. Statistics Norway

Lepez, Vincent 2007. “Ch.3: Hydrocarbon reserves” pp.97-124 in *Oil and gas exploration and production – reserves, costs, contracts*. Paris: IFP publications

Lund, Helge 2012. “Konsernsjef Helge Lund ser framover på 40-årsdagen”, published on Statoil's homepage for the 40 years anniversary. Available online through URL: <http://www.statoil.com/no/About/History/Pages/Konsernsjef%20Helge%20Lund%20ser%20framover%20på%2040-årsdagen.aspx>

Marcel, Valérie 2006. *Oil titans – National oil companies in the Middle East*. London: Chatham House

Mansoori, G. Ali, Rahoma S. Mohamed and Denis José Schiozer 2001. “Editorial. An introduction to petroleum production research in Brazil” pp. 73-77 in *Journal of Petroleum Science and Engineering* 32. Elsevier

Mendonça, Robert Wagner 2012. “Petrobras and Statoil: Trajectories, System of Innovation and Local Content”, working paper Program and Administration, University of Brasilia

MME 2013. *Conselho Nacional de Política Energética (CNPE)*, Ministry of Mines and Energy homepage. Available online through URL: http://www.mme.gov.br/mme/menu/conselhos_comite/cnpe.html

Moe, Ola Borten 2013. “The Norwegian Model: Evolution, Performance and Benefits”, Speech by the Norwegian Minister of oil and energy at "The Norwegian Experience in the Oil and Gas Sector" Seminar in Mexico, 8 May 2013

Mommer, Bernhard 2002. *Global oil and the nation state*. Oxford: Oxford University Press

MPE 2012. Information about General secretary Elisabeth Berge. Available online through URL: <http://www.regjeringen.no/en/dep/oed/the-ministey/Administrative-staff/secretary-general-elisabeth-berge.html?id=446492>

NBIM 2013. “Statens pensjonsfond utland – Markedsverdi”, Norges Bank Investment Manager. Available online through URL: <http://www.nbim.no/no/Investeringer/markedsverdi/>

Nordeng, Øystein 2008. “Statoil som internasjonal aktør”, pp. 31-38 in *Samtiden* 2:2008.

NPD 2010. Available online (last accessed 20 June 2013).
URL: <http://www.npd.no/en/Publications/Norwegian-Continental-Shelf/No2-2010/10-commanding-achievements/>

NPD 2013a. *Fakta 2013*, annual publication by the Norwegian Petroleum Directorate. Available online (last accessed 9 May 2013).
URL: <http://www.npd.no/Publikasjoner/Faktahefter/Fakta-2013/Kap-1/>

NPD 2013b. ”Om ledelsen”, information about the NPD leadership. Available online through URL: <http://www.npd.no/no/Om-OD/Organisasjon/Ledelsen/>

Offshore.no 2009a. “Superbyråkraten”, interview with Ole Andreas Lindseth, published 24 April 2009. Available online through URL: <http://www.offshore.no/nyheter/sak.aspx?id=24687>

Offshore.no 2009b. “Yes, minister”, interview with Elisabeth Berge, published 27 November 2009. Available online through URL: http://www.offshore.no/sak/27488_yes_minister

Offshore.no 2011. “Statoil i innovasjonstoppen” published 5 April 2011. Available online through URL: http://www.offshore.no/sak/32312_statoil_i_innovasjonstoppen

Pargendler, Mariana, Aldo Musacchio and Sergio G. Lazzarini 2013. "In strange company: The puzzle of private investment in state-controlled firms", working paper 13-071, Harvard Business School

Perman, Roger, Yue Ma, James McGilvray and Michael Common 2003. *Natural resources and environmental economics*, 3rd edition. Essex: Pearson Education Limited

Petrobras 2013. "About us", available through Petrobras' official website, URL: <http://www.petrobras.com.br/en/about-us/>

Petrobras 2013. *About us*, Petrobras homepage. Available online through URL: <http://www.petrobras.com.br/en/about-us/>

Petrobras Magazine 2012. *Our Board of Directors elects Graça Foster as CEO*, article published 9 February 2012.

Prochnik, Victor 2011. "Brazil's local content industrial policy for the oil and gas chain: the case of equipment purchase for process control", Institute of Economics, University of Rio de Janeiro, available online through URL:

http://hum.ttu.ee/failid/HKAC%202011/HKAC_prochnik.pdf

Revenue Watch 2013. Oil, gas and minerals for the public good: The Revenue Watch 2013 resource governance index. Available online through URL: <http://www.revenuwatch.org/rgilive>

Riis-Johansen, Terje 2010. "The Brazilian market seen from a Norwegian perspective" speech by the Norwegian Minister of oil and Energy at a Breakfast Network Meeting, Rio de Janeiro 14 September 2010

Rodriguez, Monica Rebelo and Saul B. Suslick 2009. "An overview of Brazilian petroleum exploration lease auctions" pp. 6-20 in *Terra* 6(1).

Ryggvik, Helge 2010. "The Norwegian Oil Experience: A toolbox for managing resources?", report pp.1-113, Centre for Technology, Innovation and Culture (TIK), University of Oslo

Sachs, Jeffrey D. 2007. "Ch.7: How to handle the macroeconomics of oil wealth" pp. 173-193 in Humphrey, Macartan, Jeffrey D. Sachs and Joseph E. Stiglitz (eds.) *Escaping the resource curse*. New York: Columbia University Press

Segal, Paul 2012. "How to spend it: Resource wealth and the distribution of resource rents" pp. 330-348 in *Energy Policy* 51. Elsevier

Sennes, Ricardo Ubiraci and Thais Narciso 2009. "Ch. 2: Brazil as an international energy player" pp. 17-54 in Brainard, Lael and Leonardo Martinez-Diaz (ed.) *Brazil as an economic superpower?*. Washington DC: Brookings Institution press

Soros, George 2007. "Foreword" pp. XI-XVIII in Humphrey, Macartan, Jeffrey D. Sachs and Joseph E. Stiglitz (eds.) *Escaping the resource curse*. New York: Columbia University Press

Statoil 2008. *CV Helge Lund*. Available online through URL: <http://www.statoil.com/no/About/CorporateGovernance/GoverningBodies/CorporateExecutiveCommittee/Pages/HelgeLund.aspx>

Statoil 2011. *Technology and Innovation*, Statoil homepage. Available online through URL: <http://www.statoil.com/no/technologyinnovation/researchinstatoil/pages/default.aspx>

Statoil 2012a. *Annual Report 2012*.

Statoil 2012b. *Kort om utvinningsmetoder*, Statoil homepage. Available online through URL: <http://www.statoil.com/no/technologyinnovation/optimizingreservoirrecovery/recoverymethods/pages/aboutrecoverymethods.aspx>

Statoil 2013a. *Kort om Statoil*, Statoil homepage. Available online through URL: <http://www.statoil.com/no/About/InBrief/Pages/default.aspx>

Statoil 2013b. *Statoilboken – Statoils øverste styrende document*, Statoil homepage. Available online through URL: <http://www.statoil.com/no/About/TheStatoilBook/Pages/TheStatoilBook.aspx>

Statoil 2013c. *Om Statoil*, Statoil homepage. Available online through URL: <http://www.statoil.com/NO/ABOUT/Pages/default.aspx>

Statoil 2013d. *Karriere*, Statoil homepage. Available online through URL: <http://www.statoil.com/no/Careers/Pages/default.aspx>

St.meld. 2011. “En næring for framtida – om petroleumsvirksomheten. Melding til Stortinget 28 (2010-2011)”, White paper from the Ministry of Petroleum and Energy to the Parliament

Sæther, Bjørnar, Arne Isaksen and Asbjørn Karlsen 2011. “Innovation by co-evolution in natural resource industries: The Norwegian experience” pp. 373-381 in *Geoforum* 42(3). Elsevier

Teknisk Ukeblad 2011. “Lokker fram innovasjon” published 29 March 2011. Available online through URL: <http://www.tu.no/olje-gass/2011/03/29/lokker-fram-innovasjon>

Thurber, Mark C., David R. Hulst and Patrick R.P. Heller 2011. “Exporting the “Norwegian model”: The effect of administrative design on oil sector performance” in *Energy Policy*. Elsevier Ltd.

Thurber, Mark C and Benedicte Tangen Istad 2012. “Ch. 14. Norway’s evolving champion: Statoil and the politics of state enterprise” pp. 599-654 in Victor, David G., David R. Hulst and Thurber Mark (eds.) 2012. *Oil and Governance – State-owned enterprises and the world energy supply*. Cambridge: Cambridge University press

Thurber, Mark and Benedicte Tangen Istad 2010. “Norway’s evolving champion: Statoil and the politics of state enterprise”, report issued by Program on Energy and Sustainable Development, May 2010, Stanford University

Thurber, Mark and David R. Hults 2012. "Risk attitudes shape national oil company strategies" in *World Oil* 233(6).

Victor, David G., David R. Hults and Mark Thurber (eds.) 2012. *Oil and Governance – State-owned enterprises and the world energy supply*. Cambridge: Cambridge University press

Vilkensén, Marte Lie 2006. *Creating a corporate culture in a multinational corporation – The case of Statoil*, Master thesis in International Business, Norwegian School of Economics and Business Administration, Bergen

Zamanou, Sonia and Susan R. Glaser 1994. "Moving toward participation and involvement: managing and measuring organizational culture" pp. 475-502 in *Group & Organization Management* no.19. Sage publications