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# In what ways can a strong and well-known cluster act as a facilitator for SMEs looking to internationalize?

**The case of NCE NODE and the clustering firms internationalization process towards Brazil.**

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This master thesis marks the end of my time at Copenhagen Business School and the final step towards my MSc degree in International Business. It has been five exciting, challenging and joyful years.

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## Abstract

This thesis aims to explore in what ways coming from a strong, well-known cluster can act as a facilitator for small- and medium sized enterprises (SMEs) looking to internationalize. The NODE cluster was chosen as a case due to its unique position as one of the few Norwegian clusters that is able to compete on a global level. Brazil was chosen as a case due to its position as a major recipient of FDI from the companies within the NODE cluster. When I started working with this thesis, I found that few researchers had looked in to the effects a cluster may have on the internationalization of the clustering firms. The findings in this thesis may, even if they are not generalizable to other clusters, be used as a foundation for further research on the topic.

I find that knowledge sharing plays an important role in the internationalization process for the companies in the cluster, and that the informal exchange of tacit knowledge seems to play an extra important role. I show how being located in a cluster with small geographic proximity and strong social ties helps to ease the access to this kind of knowledge. I also show how the reputation of the cluster definitely acts as a facilitator for the SMEs in their internationalization process. I find that this happens in several ways, but that the way it helps to reduce the legitimating expenses for the SMEs is the most important one. Further on, I find that NODEs status as a leading center in the drilling industry makes them a magnet to high quality investments, and that they attract key players from both Norway and abroad. I show how this makes the cluster stronger which again makes it easier for the firms to internationalize.

In general, I show how insidership in networks helps to ease the access to the tacit knowledge that plays such an important role in the internationalization process. I show how the most important source of competitive advantage for these firms that competes on a global market, seems to be local.

*"It is the long history of humankind those who learned to collaborate and improvise most effectively have prevailed."*

--- Charles Darwin --

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# 1 Introduction and motivation

The core focus of this thesis is to explore how being part of a strong industrial cluster can help to facilitate the internationalization of the clustering firms, and in particular, the small- and medium sized enterprises (SMEs). The thesis will focus on the Norwegian oil and gas industry, and NCE NODE (NODE) and the clustering firm's internationalization process towards Brazil is chosen as a case study. NODE is an oil and gas cluster located in the southern part of Norway and was chosen for two main reasons: First off all, the cluster has over the last 10-15 years experienced huge success, and the cluster today consists of several companies that have managed to establish themselves on the international market. This makes it an interesting case. Second, I have a personal interest in the industry, the cluster and the firms since the majority of the firms are located in my hometown and the two largest are located in the "Drilling Bay", 100 meters from my house. Brazil was chosen as a case due to its position as an oil and gas market with huge potential, but also with demanding challenges. The fact that many of the companies in NODE have chosen Brazil as a target market makes it possible to analyze if being part of NODE can help the companies to overcome the challenges they will meet, and succeed in this market with so much potential.

The thesis is divided into seven main sections and proceeds in the following way.

Section 1 – Introduction and motivation	In this section I have presented my motivation for investigating clusters in general and NODE in particular
Section 2 – Research Question	In this section I have outlined my research question
Section 3 – The field of study	In this section I have introduced the field of study. The Norwegian petroleum industry, NODE and the Brazilian oil and gas industry is presented.
Section 4 – Literature review	This section is a review of literature on internationalization, clusters and knowledge.
Section 5 – Methodology and data collection	This section is the methodology chapter, and consists of an introduction to the research context and a guide through the qualitative methods chosen for this research.
Section 6 - Analysis	This section is the analysis where my empirical findings are presented. Statements made by the interview objects are discussed based on the theory presented in the literature review
Section 7 – Main findings, conclusion, limitations and further research	This section is the final part of the thesis. This includes a presentation of the main findings and the conclusion of the research. Further on, this part includes limitations of the research and my suggestions for further research on the topic.

## 2 Research question

The research question aims to serve as a foundation for the thesis and is decisive for the choice of methodology. My research question is explorative in nature and is based on the literature review, the state of the NODE cluster, and the clustering firm's internationalization process towards Brazil. I have proposed the following research question:

*In what ways can a strong and well-known cluster act as a facilitator for SMEs looking to internationalize? The case of the NCE NODE cluster and the clustering firms internationalization process towards Brazil.*

## 3 The field of study

### 3.1 Industrial clusters

Since the middle of the 1990s, industrial clusters have received a great deal of attention in both academia and within policy decisions. The ITC-industry in Silicon Valley, the life-science industry in Boston, and the oil and gas industry in Houston stands out as three of the most prominent examples of what the Norwegian professor Torger Reve defines as Global Knowledge Hubs (Reve, 2011). In the start of the 1990s, it was found that a number of innovation projects had been developed in collaboration between different enterprises, and between business environments and research oriented- and academic environments. At the same time, an international discussion developed around the fact that enterprises that were part of large clusters, achieved higher value creation compared to those that were without such linkages (Reve, 2011). Obviously, what is happening inside the companies is still of great importance, but theory has revealed that the immediate business environment that surrounds these companies plays a vital role.

The term cluster is also known as "industry cluster", "Porterian cluster" and "competitive cluster". The term was popularized by Michael Porter in his book, "The Competitive Advantage of Nations", and has since gained popularity from scholars all around the world. According to Porter, clusters are "*geographic concentrations of inter-connected companies and institutions in a*

*particular field*” (Porter, 1998, p. 78). Porter (2000) also emphasizes these firms’ ability to “compete but at the same time, also cooperate”, and he states that a firm could benefit from having more local competitors. Based on this new insight, cluster development has become a focus for a number of governments, and several countries have developed policies and policy instruments explicitly directed at stimulating existing and new clusters. Clusters have in particular been seen as a good way for SMEs to raise their innovation capabilities and their competitiveness (Molina & Yoong, 2003). In Norway the government have, in collaboration with Innovation Norway, established their own program for developing new clusters. The same thing is now happening in Brazil, and when the Brazilian government looks for successful examples that can be used as a benchmark for how to develop a well-functioning cluster, they look to Norway and to NCE NODE (Jakobsen & Røtnes, 2012).

### **3.2 Norwegian petroleum**

Since discovering the first oil on the NCS in 1969, Norway has in the 44 following years been able to build a massive and highly successful industry in both oil and gas. This achievement would not have been possible if it were not for some smart forward-looking politicians. After the discoveries, the Norwegian parliament decided to secure national control over the natural resources. There were also taken actions in order to secure that domestic companies would benefit from the findings. In order to facilitate knowledge transfer to Norwegian oil companies and develop domestic expertise, the government demanded that the operating companies had to use Norwegian suppliers, and that the operating companies themselves had to be located in Norway (Reve & Jakobsen, 2001). Further on, the government wanted to use the petroleum industry to maintain and stimulate employment in declining regions, and thus, the on-shore operations were spread around the coastline. The Norwegian Oilfield Service (OFS) has grown to become an advanced industry with world-class technology, and is no longer serving just the NCS, but exporting to the whole world (KonKraft, 2008).

The conditions in the North Sea created a new set of challenges for the companies that wanted to operate this new oil field. The rough sea, the harsh climate, and the deep water demanded new technology, and the Norwegian companies that were able to meet these demands quickly became



successful (Vatne, 2008). Today, the ability to adapt to these conditions has become a source of competitive advantage for the Norwegian supplier companies. Their products and services are in demand all over the world, but especially oil fields that share some of the same characteristics as the North Sea are interested in Norwegian technology. A good example is Brazil, where there currently are only a few companies in the world that can deliver the drilling equipment needed for their deep-water drilling, and three of these are located at the southern coast of Norway.

### **3.2.1 The rise of the supplier industry**

The petroleum sector is today the most important sector in the country when it comes to value creation and export. In recent years, petroleum has represented approximately 60 percent of Norway's total exports (Karlsen & Nordhus, 2011). The oil and gas industry is divided into licensees/operators and oil and gas suppliers. Operators are the firms that either holds production licenses or that has been granted operatorships of oil or gas fields. Oil and gas suppliers are the firms that provide oil and gas-specific services such as drilling and well intervention, or more generic services like offshore supply vessels. It is the supplier industry that is of interest in this thesis, and examples of these companies are Aker Solutions, FMC Technologies (FMC), National Oilwell Varco (NOV) and Aibel.

The international technology transfer has for the recent decades changed completely as Norway has gone from being completely dependent on foreign petroleum technology to now being a leading exporter of advanced technology products. As more of the world's production of oil and gas has moved offshore, to both deeper waters and harsher climates, the demand for Norway's world-leading technology and competence has increased. Over the last 10-15 years, several of the Norwegian suppliers have gained a solid international foothold, and in 2011, the international sales of the supplier industry was estimated to be around NOK 150 billion ("High growth in the supplier industry," 2012). The Norwegian-based supplier industry today employs over 120,000 employees and is the industry with the largest value creation per employee in Norway (Sasson & Blomgren, 2011).

The internationalization of petroleum-related businesses plays an increasingly important role for the Norwegian economy. As the activity on the continental shelf decreases, entering new markets and export knowledge and technology is essential (Karlsen & Nordhus, 2011). The Norwegian oil and gas industry has stepped up and is currently rivaling Houston regarding the status as a global knowledge hub. The competitive strengths seem to be in the technology and especially in sectors like drilling, rigs and subsea for demanding deep-sea operations that requires high environmental and safety standards. The international competitiveness of the industry comes from the strengths of its innovation and its ability to redefine existing industry standards (“Norway Anything But Standard,” 2013). Today, several of the world leading oil and gas technology corporations, such as NOV and FMC, are operating out of Norway, and approximately 50 percent of the companies in the Norwegian offshore supply industry today has foreign ownership (Reve, 2011).

### **3.3 History of the oil and gas supplier industry in Southern Norway**

This thesis studies firms in the oil and gas supplier industry in the Agder region (Vest- and Aust Agder) in the southern part of Norway. Southern Norwegian companies have been involved in the oil and gas supplier industry since the early 1970s. The roots of the companies go all the way back to the cradle of the Norwegian oil age, or even further when you include the maritime traditions of Southern Norway. The mechanical competence at the different mechanical workshops located throughout the whole coastline was crucial in the initial phase of the development of the industry (“Om NODE,” n.d.). The industry in Southern Norway was among the pioneers in the development of the continental shelf of Norway. The important role of the industry was recognized and in 1972, the Minister for Industry, Sverre Walther Rostoft, took the initiative to found Oil Industry Services A/S (OIS). This became Norway’s first umbrella company for commissions in the oil industry. It was a cooperation of several workshop-yards, and the companies involved collaborated to get contracts and to become a part of the emerging oil industry (Gjerde, 2011).

OIS laid the foundation for the companies that today have put Southern Norway on the global map. The companies started with developing safety systems, but with the efforts from local

entrepreneurs such as Bjarne Skeie, companies from Southern Norway evolved to become international contestants in developing drilling equipment for offshore platforms (Vatne, 2008). In the last 15-20 years, a number of new firms have been established. Many of them are spin-offs from existing firms, but some are also entrepreneurial start-ups. Today, companies located in an area that is now known internationally as “*the Drilling Bay*”, is producing between 70 and 95 percent of the worlds’ offshore drilling packages (Isaksen & Karlsen, 2012).

### 3.4 NCE NODE

The firms in this case study are all members of Norwegian Offshore & Drilling Engineering or NCE NODE (NODE). NODE is an industrial cluster located in the Agder region of Southern Norway. The cluster organization was founded in 2005, and currently involves 59 companies within the oil and gas industry (“Om NODE,” n.d.). The cluster includes around 9500 employees, and had in 2012, an overall turnover of around 45 billion NOK. The order-reserves were around 95 billion NOK. As much as 95 percent of the revenue comes from export, and this export accounts for one third of the total Norwegian export of oil and gas equipment. The cluster consists of both small and large firms, ranging from 10 to 1500 employees. Two of the firms, National Oilwell Varco and Aker Solutions, dominate as the only companies with over 1000 employees, while there are between 10 and 15 firms with more than 100 employees. Most of the firms in the cluster are results of local entrepreneurs, but today, nearly half of the firms have been taken over by multinational corporations (Isaksen & Karlsen, 2012).

The companies within the cluster supply everything from high-tech equipment for use on ships and platforms, to complete platform installations. Their customers are located all over the world, and they are usually rig-owners, oil companies or shipping companies. The biggest NODE companies are today world-leading companies, with significant global market shares in the following four niches (“Om NODE,” n.d.):

- Drilling solutions
- Active heave compensated cranes
- Offshore on- and off-loading, mooring and anchoring
- Complete platforms

For a long time, these companies were more recognized globally than in their home country, or even in their home region. As Roald Amundsen (at that time, CEO, Aker MH) put it: “*We are more well known in Houston as being world leading than we are in Norway*” (Johannessen, 2011). Many of the companies found that the region was not heard, and their solution was often to move their business to the oil capital of Norway, Stavanger. Also, there was no regional collaboration between the companies, and because of the competition between them they almost did not talk together. In 2004, a small group of industry leaders from the oil and gas industry of Southern Norway decided that something had to be done in order to change the situation. They began to discuss the possibilities for collaboration, and in 2005 a pilot project was started.

According to Kjell O. Johannessen, Project Manager at NODE, the collaboration was a success from day one. For the first time, government ministries were willing to listen to the companies. The companies within the cluster went from rivalry to beneficial co-operation and healthy competition (Johannessen, 2011). After the foundation, the cluster quickly developed from being a cluster with strong focus on scale and production, into a cluster with focus on knowledge and innovation. In 2006, NODE obtained status as an ARENA project, a national program for long-term development of regional business clusters. Through the program, NODE was able to develop good interaction with important innovation policy agencies such as Innovation Norway, the Research Council of Norway and the Industrial Development Corporation of Norway (Johannessen, 2011).

In 2010, NODE took a further step and went from being a regional project (Arena) to a global project (Norwegian Centre of Expertise or NCE). The NCE project is a commercial development program that is organized by Innovation Norway and the Research Council of Norway. To be assigned a status as an NCE cluster, a number of criteria must be met. The cluster must have world-class cutting edge skills, a global outlook and a high potential for innovation and growth (Vik, 2011). This step represented a significant change in the focus of the project since it went from being a regional project to becoming a global project. Professor Torger Reve of BI-Norwegian Business School was the main architect of the change, and according to Professor

Reve, only two clusters in Norway has the dimensions needed for taking a position as a “global knowledge hub”. These two are NCE Maritime and NCE NODE (Johannessen, 2011). Today, eight years after the start, NODE is a world-leading industrial cluster with ambitions of further development in order to reach the ambitious goal of keeping the position as a world-leading cluster within its field.

#### **3.4.1 NODE Brazil**

The two largest companies in the cluster, Aker Solutions and National Oilwell Varco have been established in Brazil for a long time. A few other companies in the cluster had by 2009 also taken the step and established themselves in Brazil, but still, there were very few of the SMEs in NODE that had approached this potentially very lucrative market. In 2009, the leaders of NOV approached the leader of NODE, Kjell O. Johannessen, and expressed their concern regarding the lack of interest that the SMEs showed towards approaching Brazil. Due to the rules regarding local content, which will be further discussed in section 3.3.3 , both NOV and Aker were in need for suppliers that could deliver high quality products to their operations in Brazil. They asked if NODE could start a Brazil project, and that is how NODE Brazil was born (Interview with Kjell O. Johannessen from NODE).

In December 2009, the first NODE Brazil seminar was arranged. All the companies in the cluster were invited and 25 of these showed up and expressed their interest. Experts from Innovation Norway, INTSOK - Norwegian Oil and Gas Partners-, industry experts and Brazil experts told the participants about the many possibilities that exist, but also emphasized on all the challenges that they would have to overcome in order to succeed. After being told about tax related challenges, VAT related challenges, the problems with corruption, the problems with regionalism and other challenges they would face, the number of participants initially dropped to 12 and then finally to 6 (Interview with Kjell O. Johannessen from NODE). This does not mean that there are just 6 of the SMEs in NODE that are working towards establishing themselves in Brazil, but these 6 companies continued in the NODE Brazil project. These 6 companies divided themselves into 2 company networks. 3 of them joined forces and established a new company (Noba Tech) that would try to get a foothold in Brazil. These 3 were competitors in Norway but are working

together in Brazil. The other 3 established a type of marketing and sales network where they work together to negotiate with companies in Brazil that can represent them (“NODE Brasil,” 2013).

In April 2013, NODE signed an agreement with a Brazilian cluster, Vale do Aco, from the Ipatinga region. This region is the same region as the one where Noba Tech has established their company. It is a region with several mechanical companies that has a lot in common with the companies in NODE. When they established a cluster organization in the region, they were told to look to Kristiansand and NODE for an example of best practice within the field (Taraldsen, 2013), (Interview with Kjell O. Johannessen from NODE). In August 2013, the president of the cluster, Jéferson Bachour Coelho, visited the Agder region to talk to NODE companies and the local government. They had two main goals for the trip, the first was to look for potential partners for the companies in the cluster, the second was to learn from NODE and the positive effects a cluster can have on a region (Ljosland, 2013).

## **3.5 Brazil**

### **3.5.1 The Brazilian oil and gas market**

In 2007, Petrobras discovered the *prè-sal* (“beneath the salt”) or pre-salt fields. The fields are located in Campos Basin, outside of Rio de Janeiro, and Santos Basin, outside of Sao Paulo. They contain enormous amounts of oil, but they also come with an obstacle; the oil is buried beneath rock and salt in what is known as ultra-deep waters (up to 7000 meters below sea level) (*The Impact of Pre-Salt*, 2010). The deep water, combined with the massive layer of rocks and salt makes extraction of the petroleum challenging. These conditions demand specialized technology, skilled personnel and a great deal of experience. Petrobras is the largest producer of oil in deep-water provinces in the world and they are highly respected in the industry. Still, drilling in these fields will pose challenges that are greater than both Petrobras, or any other oil company, has ever faced before. The finding of these giant oil-fields has put Brazil in a completely new situation, and in only five years, Brazil has become “the place to be” for oil and gas related companies (“Oil in Brazil: The perils of Petrobras,” 2012).

### 3.5.2 Petrobras

Petróleo Brasileiro S.A. (Petrobras) is a semi-public Brazilian energy corporation. The company controls virtually all of the upstream oil and gas production, and also dominates the exploration activity in Brazil. At the moment, Petrobras accounts for about 95 percent of Brazil's national oil and gas production. They are expected to experience a steadily growth over the next years, and the company expects to spend an average of \$45 billion per year in the next few years, where more than half of this investment is dedicated to upstream technology (*Brazil oil and gas*, n.d.). However, it must be noted that the state of the Brazilian oil adventure and the state of Petrobras has been subjects of intense discussion for the last couple of years. Brazil's oil production is currently falling, the imports of gasoline is rising and this has casted doubt on what was supposed to be an oil bonanza (Romero, 2013).

Since the discoveries of the pre-salt fields, Petrobras has developed to become a world leader in advanced technology for deep-water and ultra-deep water oil production ("Brazil's economy: The devil in the deep-sea oil," 2011). Still, they, like the rest of the industry in Brazil, depend on foreign expertise, technology and labor. They do not have the supplier industry needed to supply the equipment needed to develop the oil fields. This is where the Norwegian offshore supplier industry comes in (Ree, 2011).

### 3.5.3 Norway and Brazil

Norway and Brazil have a long history of trade and Brazil is today Norway's most important partner in Latin America, and after the EU and the US, the country in the world with the highest amount of Norwegian investments. As early as the start of the 19<sup>th</sup> century, Norway started to trade "klippfisk" (bacalhau) in exchange for Brazilian coffee ("Brasil," 2011). The number of Norwegian companies has increased rapidly in the last five years, and currently there are around 130 Norwegian companies that operate in Brazil. The majority (around 75 percent) of these companies are within the offshore and maritime supplier industry, where the largest companies are Statoil, Aker Solutions, Sevan Marine, Seadrill, BW Offshore and FMC (Taraldsen, 2013). Statoil has already started production at the first phase of the Peregrino heavy oil field, and has now overtaken Shell to become the second-largest oil producer in Brazil, only behind Petrobras

(*Brazil Oil & Gas Report Q2 2013*, 2013). Brazil is the second largest market for Norwegian oil and gas companies, only after South Korea, and in 2011 the revenue from Brazil was approximately NOK 20 billion. The majority of this revenue comes from segments that are involved in the early life cycle of an oil field, segments where companies within the NODE cluster are world leading companies (Rystad Energy, 2012)

#### **3.5.4 Challenges in Brazil**

The oil and gas industry in Brazil faces several challenges, where some of them are more important than others. Looking at these risks from the view of a Norwegian offshore supplier, *corruption, tax and vat regulations, bureaucracy, local content requirements*, and *cultural differences* comes to mind as the most important ones (interviews with Kjell O. Johannessen from NODE and Rita Schage from Innovation Norway).

##### **3.5.4.1 Corruption**

Countries that are located within the geographic regions where the majority of the world's oil reserves resides today; South America, the Middle East, former Soviet Union, Central and West Africa, are also among the most corrupt places to do business ("2012 Corruption Perceptions Index -- Results," 2012). These countries typically lack the control systems and the infrastructure that is necessary to combat the corruption, and they also often happen to have a cultural dynamic that heightens the risks that are associated with corruption and bribery. The presence of natural resources like petroleum, iron, coal and other minerals, has also proved to have a significant adverse effect on the level of corruption in a country (*Corruption Risk In the Oil and Gas Industry*, 2012).

Products that are needed in the offshore industry are often imported and thus they have to pass through customs. Officials working with the declaration of these products may often seek some kind of kickback payment or other fees in order to expedite the processing of the licenses and permits needed for clearance. A hold up in customs for a product or service that is needed can cost the companies a great deal of money, and thus the pressure for paying the necessary bribery is high (*Corruption Risk In the Oil and Gas Industry*, 2012). Brazil has struggled with corruption for a long time, and is currently ranked at 69<sup>th</sup> place with a score of 43 (where 0 means that a



country is perceived as highly corrupt and a 100 means that a country is perceived as very clean) on Transparency International's ranking of corruption ("2012 Corruption Perceptions Index -- Results," 2012).

#### **3.5.4.2 Legal framework**

Following the finding of the Pre-Salt field, the Government in Brazil decided that changes needed to be made to the legislation in place. The idea was to adapt the legislation to the new situation of the country where the goal was to increase the Governments stake in future entrepreneurs, and to increase their power on the exploitation of oil and gas (Drago, 2011). By South-American standards, the legal system is well structured; but still, it is not efficient enough to handle the burden of all the cases it receives. The Brazilian legislation tends to have an extreme demand for documentation, and this process makes it difficult for foreigners without experience with the process. The exaggerated requirement for documentation tends to slow down the business. One of the problems with these slow-going formalities is that it creates an incentive for corruption, where it becomes cheaper and faster to pay your way out of the process rather than go through it the regular way (*Brazil oil and gas*, n.d.).

#### **3.5.4.3 Local content**

Brazil has a long history of promoting local content and has used this strategy for the last three decades. The strategy forces the international companies that want to operate in Brazil to have a certain percentage of local content in their products or services. The exact number of the local content that is required in the oil industry vary greatly, depending on the location of the blocks offered in the bidding rounds (*Doing Business in Brazil*, n.d.). The Brazilian government sets the local content regulations. The operator of the oil licenses is obliged to use a certain level of equipment and services that is offered by the local supplier and service industry. For the period from 2011-2015, in the offshore industry, they require a local content share of 55 percent in the development phase and a local content share of 37 percent in the exploration phase. From 2019, the requirements in the development phase is expected to rise to 65 percent (*Brazil oil and gas*, n.d.). These high local content provisions reduce the flexibility the companies have to import both equipment and manpower, making it challenging for the foreign suppliers to deliver their products. The oil and gas supplier industry in Brazil is not yet on the level that is needed to

deliver the most technical products and this makes it difficult for the oil companies to fulfill the local content requirements.

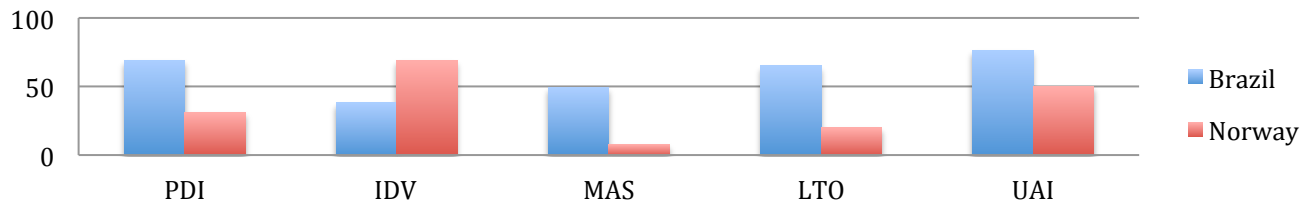
The local content requirements pose as a serious risk for the development of the Brazilian oil and gas adventure. In the past, the Brazilian suppliers and service providers have failed to develop any form of long-term commitments to efficiency, they have failed to master the art of technological innovation and they have failed to succeed with managerial modernization. When the local content requirements are set as high as they are, they can act as a shield against foreign competition, and this lack of competition is likely to increase the challenges of solving the above mentioned weaknesses (*The Impact of Pre-Salt*, 2010).

#### **3.5.4.4 Culture**

Culture is something that all humans, in some way, take part of. This can be through a specific national culture, a specific organizational culture or a specific corporate culture. Prof. Geert Hofstede identified five cultural dimensions that can help explain cultural differences, and further on, he developed an index that can help to measure these different cultural dimensions. The five dimensions he used for this index were; power distance (PDI), individualism (IDV), masculinity (MAS), long-term orientation (LTO) and uncertainty avoidance (UAI). By studying the global business culture of IBM in 50 countries and with 60,000 respondents, he managed to establish country specific relative measures of how the dimensions were dominant in the different country's culture (Hofstede, 1991).

Brazil is a mixture of many different races and as a consequence, a mix of cultures. The work of Hofstede can be used to highlight the differences between Norway and Brazil. By looking at the differences, it is clear that the cultural differences are another challenge that the Norwegian companies needs to consider before they start doing business in Brazil. As can be seen in the graph below, the scores indicate substantial differences between Norway and Brazil.

## Professor Geert Hofstede's 5D Model



When analyzing Hofstede's dimensions, it is clear that Brazil is very similar to many Latin American countries. The dimension with the highest score is Uncertainty Avoidance (UAI), with a score of 76. This indicates that the society has a low level of tolerance for uncertainty. In order to reduce the level of uncertainty, and to make things work, bureaucracy, strict laws and regulations is adopted and implemented. A result of this characteristic is that the society is very risk adverse, and you need to spend time with your business partner in order to build the trust needed to make an agreement (Andersen, n.d.). As most of the Latin countries, Brazil scores low on the Individualism dimension. The Latin countries are considered to be collectivist societies where a long-term commitment to your "member-group" is important. In a collectivist culture, loyalty is extremely important, and overrides most of the other societal rules. It takes time to develop a strong and trustful relationship in Brazil, but when you have managed it, you have a partner for life (Andersen, n.d.).

Despite all the challenges, the Brazilian oil and gas market is still projected to be worth \$42 billion in 2015. The draw for the Norwegian oil service industry is evident, and in spite of the local content requirements, Petrobras seems to be choosing the types of high-end technology produced by Norwegian suppliers over more cost efficient competitors from other parts of the world. This strategy is similar to the strategy Statoil adopted during the development of the NCS. Brazil has just started setting out on a path that Norway took 40 years ago, and only time will tell whether they succeed in replicating the highly praised Norwegian formula ("Norway Anything But Standard," 2013).

## 4 Literature review

In the process of investigating the effect being part of a cluster has on the internationalization process of an SME, numerous literature could provide insight and be considered as relevant. In this thesis, the study will be drawing on selected areas and insights from internationalization literature, literature on industrial clusters and strategic management literature. In the following sections, I will discuss the literature that I considered to be relevant for this thesis.

### 4.1 Internationalization

In order to explain the internationalization of companies, authors have proposed, and used, several theories. According to Weisfelder (2001), the underlying questions in all these theories can in general be divided into two different questions, “why do firms internationalize” and “how do firms internationalize?”.

#### 4.1.1 Why do firms internationalize?

The most common theory related to why firms internationalize is the eclectic paradigm of international production (OLI), developed by John Dunning in a series of publications (Dunning, 1981, 1998, 2001). The eclectic paradigm of international production aims to identify the factors, incentives, and configurations that cause a multinational enterprise (MNE) to pursue a foreign investment strategy to a particular region. The internationalization process is viewed as a series of static rational decisions, and Dunning lists three factors that determine the international activities of MNEs (Rugman, 2010). These three factors determine whether a company will pursue a strategy that focuses on foreign investment within a specific region, or not. He identifies three potential advantages that can motivate firms to employ a strategy of FDI rather than to just produce at home and export, or buy imported components in the market. The three factors are: ownership advantages, location advantages and internalization advantages. The theory suggests that the MNEs develop competitive advantages at home (ownership advantages), and then transfer these advantages abroad to specific countries (depending on the location advantages) through FDI. This in turn allows the MNEs to internalize the ownership advantages (Rugman, 2010).

The ownership advantages refers to the fact that in order to justify internationalization, the company needs to have some advantage that comes from either their ownership of a foreign asset, or from the company's ability to coordinate assets across borders so that the nature of the company compared to the competitors in a foreign market gives them an advantage. These advantages must outweigh the disadvantage of doing business abroad. Examples of such ownership advantages may be, trademark, production technique, human capital, patents or access to unique production processes (Reid, DeMartino, & Zyglidopoulos, 2005a).

The location advantages says that a company should expand to a nation or a specific area where they can gain access to location-specific advantages that makes it profitable for them to locate there (Reid et al., 2005a). Examples of such advantages are specific natural resources (oil, gas, coal and so on), logistical benefits, market access (invest in the host economy to overcome barriers to trade), or efficiency gains (cheap labor). Natural resources are a powerful driver for business, since it usually demands that the MNE is present where the resource is.

The internalization advantages refer to the benefits that the companies derive from internalizing their production in imperfect markets (Reid et al., 2005a). It refers to a MNEs ability to efficiently internalize their ownership specific advantages to reduce transaction costs during international production. If a company has internalization advantages, it means that a company should set up their own production/manufacturing in a foreign market instead of for example outsourcing it or licensing it out. This decision must be based on a cost-benefit analysis where the cost of internalization has to be measured against the cost of outsourcing the production. If the company would benefit from this, either organizationally or operationally, then they should pursue this strategy (Dunning, 1977).

#### **4.1.2 How do firms internationalize?**

Regarding the question of how firms internationalize, the most recognized theory has been the Uppsala model of internationalization developed by Johanson & Vahlne (Johanson & Vahlne, 1977). Here, the internationalization is seen as an incremental process of increasing international involvement as the firms acquire more market knowledge about foreign markets.

#### 4.1.2.1 The Uppsala theory of internationalization

The Uppsala model (pictured below) is one of the classic internationalization theories. The theory deals with how organizations learn, and how this learning can affect their investment behavior in foreign markets. It sees the internationalization process as a stepwise process that goes through a number of different stages, where firms gradually intensify their activities in foreign markets. The key feature of the model is that firms initially gain experience from their home market, and then gradually move to foreign markets. The perceived market risk of a firm is a function of the firm's own market knowledge. So when the firm's market knowledge increases through their own experiences, the less is their perceived market risk and consequently, their propensity to invest abroad increase (Reid et al., 2005a).

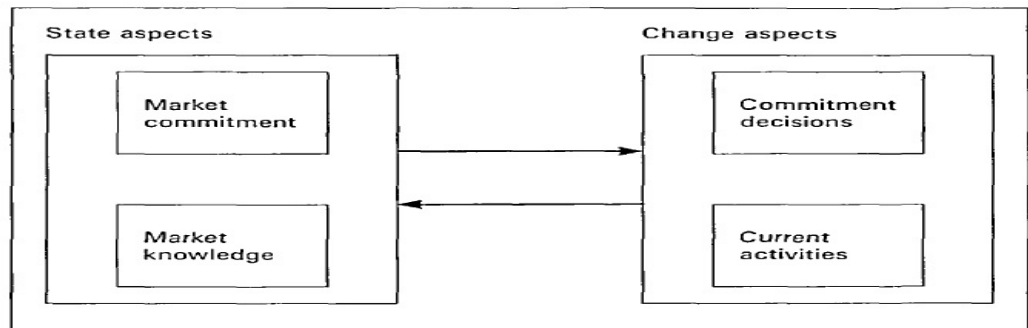


Figure 1. The Internationalisation Process of the Firm

Johanson and Vahlne also introduced the notion of “psychic distance” between countries. The psychic distance is defined as “*the sum of factors preventing the flow of information from and to the market ... [such as] ... differences in language, education, business practices, culture, and industrial development*” (Johanson & Vahlne, 1977). According to this theory, firms start with expanding to the countries that are the closest in terms of geography and/or psychic distance, and then move further away as they learn and acquire knowledge from the new markets they operate in. Firms usually start their foreign operations or foreign sales with occasional export orders, then the export becomes more regular and often takes place through an independent representative (typically an agent) and subsequently, through a sales subsidiary. After this, the firm gradually move towards more intensive and demanding modes of operation, such as starting production in the host country (Johanson & Vahlne, 1977).

The theory suggests that the main reason for why firms increase their international involvement is their accumulation of experiential knowledge of foreign markets. This knowledge increases their comfort level in these foreign markets, and this leads to further international involvement (Zyglidopoulos, DeMartino, & Reid, 2006). As the firms acquire knowledge of foreign markets, their comfort grows and their commitment to foreign markets springs. The direct involvement is a driving force of the internationalization process as it generates business opportunities. The direct involvement helps the firms to acquire market-specific knowledge which helps to reduce the risk, and the more knowledge and expertise they gain, the larger are the chances of the firm entering markets with increasingly greater psychic distances (Johanson & Vahlne, 1990). The internationalization process described in the Uppsala model is a cyclical process where each of the activities the firm performs leads to more knowledge and consequently, increased market commitment. The model predicts that both the age of the firm and the size of the firm will influence the internationalization process of the firm.

#### **4.1.2.2 Critical review of the Uppsala model**

During the last two decades, the theory presented in Johanson & Vahlne' article from 1977 have received criticism from several researchers. The emphasis on experiential learning through the ongoing activities has in particular been a source of criticism. In the article "*The concept of learning in the Uppsala internationalization process model: a critical review*" from 2002, Mats Forsgren addresses how organizational learning is conceptualized in the Uppsala model, and criticizes it for being too narrow regarding the interpretation of the term learning. He shows how research from the last decades indicates that organizational learning includes several dimensions that have consequences for the behavior of the firms. Learning through incorporating people or organizations, learning through imitation and learning through searching and scanning for new information has, in the Uppsala model, limited impact on how the internationalization behavior of the firm is modeled. Forsgren argues that this has implications for the model's ability to accurately explain and predict the internationalization behavior of the firm (Forsgren, 2002).

Forsgren shows how several researchers have found that organizations can acquire knowledge through their business relationships without having to go through the same experiences

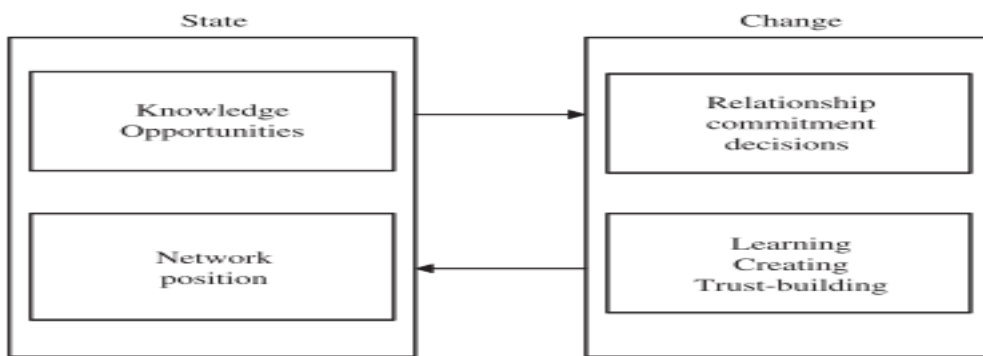
themselves. Thus access to a network of business relationships can create the opportunity for a firm to learn from other firms. The theory implies that these business relationships facilitate the assimilation of tacit knowledge from the different actors in the network, and that the firm does not need to go through the process of experiential learning by performing their own activities. Instead, market-specific, tacit knowledge can be acquired through business relationships. This also means that the prediction of internationalization as a slow process is not necessarily true since it is possible for the firms that want to approach foreign markets to do this more rapidly and also in another pattern than the one that is predicted by the Uppsala model. The key point in the critical review by Forsgren seems to be that the internationalization behavior of a firm today often seems to be *“characterized by a combination of learning through experience and learning through the incorporation of units, which already have the knowledge”*. The possible internationalization routes seems to be more varied and multifaceted than those predicted by the Uppsala Model (Forsgren, 2002).

#### **4.1.2.3 Response from Johanson and Vahlne**

Johanson and Vahlne acknowledged that their model was not up to date, and decided to revisit their “iconic” article from 1977. They reviewed the most important research that had come out since the Uppsala model was introduced and the result was the article *“The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership”* (Johanson & Vahlne, 2009). In this article they introduce a new version of the Uppsala model (pictured below). They agree that the global business environment has changed, and that the traditional neoclassical market where both suppliers and customers were independent is no longer dominating. Instead, it has changed to a web of relationships, where “insidership” in networks has become crucial. This theory is supported by Coviello and Munro’s empirical studies of the internationalization of small software firms (Coviello & Munro, 1995, 1997). Their research shows how network relationships can affect both the selection of the foreign market to enter, and also the mode of entry to the given market. According to Coviello networks can provide the firm with a pool of contacts and also help getting access to knowledge related to distribution channels, market know-how, culture, financing and more (Coviello, 2006).



Experiential learning is still a critical part of the model, but it is no longer considered to be the only way to develop knowledge. Their main proposal is that knowledge is created and accessed through networks and if firms are not part of these networks, they will not have access to the information and knowledge that exist within these networks. Insidership in networks thus has become extremely important, especially before entering a new market. By operating in the local market and spending time on building relationships, the firm can gain insidership in networks and experiential internationalization knowledge that can help the firm in their internationalization process. The result is that the most important root of uncertainty of a firm that wants to approach a new market is no longer the physical distance to the market, but the outsidership of not being part of the relevant network needed for your operations in this new market (Johanson & Vahlne, 2009).



**Figure 2** The business network internationalization process model (the 2009 version).

## 4.2 Inward internationalization

In this thesis, the focus is on NODE, a cluster that by the standards of Porter would be described as “a leading edge” cluster. Some of the leading edge industry clusters today, such as those seen in Ireland and Singapore, emerged in large part through foreign investment. Others, like Hollywood and the Detroit auto industry, were domestically owned for a long time but are now facing increasing levels of foreign ownership (Birkinshaw, 2000).

Within the literature on foreign investment and its impact on industrial clusters, there are highlighted some potential negative aspects of inward internationalization. The fact that the

foreign investors tends to be less committed to the local economy seems to be the most important one (Birkinshaw, 2000). However, for leading edge clusters, the positive aspects seem to outweigh the negatives. The leading edge clusters act as magnets to high quality investments. Through their status as a leading center within their respective industries, the clusters attract key players from both home and from abroad. When the foreign companies are established in the cluster, they can enhance the leadership of the cluster and contribute to its upgrading. Research has showed how FDI can have a positive impact on cluster advancement (Birkinshaw, 2000) and on cluster dynamics, particular through the transfer of technology (Padilla-Pérez, 2008). There are several papers looking at the possible positive or negative impact FDI can have on clusters, but the most important effect in this thesis is how inward internationalization to a cluster can help the companies within the cluster in their process of internationalization. Several researchers have showed this. When foreign investors decide to invest in a local cluster, it shows that the cluster is attractive which in turn raises the awareness of the cluster. This will enhance the perception and the reputation of the cluster, which in turn can make it easier for the companies within the cluster to internationalize (I will look more into the effect of cluster reputation in section 4.4.1.3) (Birkinshaw, 2000). Further on, it is found that the presence of FDI will enhance the degree of internationalization of the local firms (Mariotti, Mutinelli, & Piscitello, 2008). Finally, FDI can help to connect the local cluster to clusters in different locations around the world, which will help the cluster and the companies within the cluster to gain access to global knowledge networks and to connect with potential customers or partners (Oliver, Garrigós, & Porta, 2008).

The above-mentioned revisited Uppsala model showed how the business environment of the world has changed for the last three decades, where the liability of outsidership has become more and more evident. To succeed in the internationalization process, you need to be an “insider”, you need to have access to the right networks. When a foreign company invests in a local cluster, they help the cluster and the companies within to get access to new networks. This can help to turn what used to be a liability of outsidership into an advantage of insidership. This increases the potential for the companies to internationalize and to succeed in the process. When

this happens, it can become a positive spiral, or a self-enforcing loop, where the fact that the companies in the cluster succeed in their internationalization, makes the cluster even more attractive for FDI, which again increases the potential for internationalization in the cluster.

### 4.3 Social capital

For a long time, it was believed that globalization would reduce the relevance of the local context for the strategic decisions of firms. However, research has showed that it is the exact opposite that is true. Globalization increases rather than decreases the relevance of local context for firm's strategic decisions. Porter (2000, page 32) states that; *"Globalization and the ease of transportation and communication have led to a surge of outsourcing in which companies have relocated many facilities to low-cost locations. However, these same forces have created the location paradox. Anything that can be efficiently sourced from a distance has essentially been nullified as a competitive advantage in advanced economies. Information and relationships that can be accessed and maintained through fax or email are available to anyone. Although global sourcing mitigates disadvantages, it does not create advantages. Paradoxically, the most enduring competitive advantages in a global economy seem to be local."* (M. E. Porter, 2000).

One of the dimensions that play an important role for the local competitive advantages is the social ties that exist in these regions and in industrial clusters. These social ties are part of what researchers has termed social capital, and social capital is defined as *"the sum of the actual and potential resources embedded with-in, available through, and defined from the network of relationships possessed by an individual or social unit"* (Laursen, Masciarelli, & Prencipe, 2012) . In the paper *"Trapped or spurred by the home region? The effects of potential social capital on involvement in foreign markets for goods and technology"*, the authors examine the relationship between potential social capital in a region and the firms involvement in foreign markets, and finds that potential local social ties plays an important role in facilitating a firms globalization efforts. The better the opportunities for knowledge flows in the domestic region, the higher is the chance of firms involving in foreign markets. It can lead to transfer of more knowledge about business opportunities between firms and institutions, it can lead to transfer of knowledge about both local and foreign markets, and it can help to facilitate access to resources that are needed to

commercialize products. Location in a region with a high level of social capital and rich social ties among the employees of the different firms, will help the firms to facilitate contact with other organizations, it can ease resource limitations, it can help to establish legitimacy and credibility, and it can help to facilitate the development of new capabilities (Laursen et al., 2012). These findings are also in line with the above-mentioned theory of Johanson and Vahlne where they show that “insidership” in networks has become the most important source of tacit knowledge for a firm.

#### 4.4 Clusters

The idea of localized economies of scale in geographic agglomerations is not new. The theory has a long history in economics, going all the way back to Adam Smith’s observations of labor specialization and to Alfred Marshall’s theory of why firms continue to localize in the same areas (Morosini, 2004). Marshall (1925) listed three key explanations:

1. The existence of a pooled market for specialized workers.
2. The provision of specialized inputs from suppliers and service providers.
3. The relatively rapid flow of business-related knowledge between firms, which results in technological spillovers.

Agglomerations are in general static systems. They become industrial clusters or dynamic knowledge systems only when the industrial actors and knowledge actors start to interact. When this happens, knowledge is shared, challenged and upgraded (Reve, 2009). Michael Porter has through a series of articles and his book, “The Competitive Advantage of Nations, Porter (1990)”, highlighted the importance of clusters. He describes clusters as a *“geographic concentration of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, trade associations) in a particular field that compete but also cooperate”* (M. E. Porter, 2000, p. 15). He claims that the clusters succeed because the proximity in geographic, cultural, and institutional terms allow them to have special access, special relationships, powerful incentives, better information, and other advantages in productivity and productivity growth that are difficult to get access to, and tap in to if you operate from a distance (M. E. Porter, 2000). Porter (2000) continues to claim that most clusters

are not built up of just direct rivals, but of firms that target different segments of an industry. The firms complement each other. The combination of close cooperation and intense rivalry fosters innovation and entrepreneurship with a dedication to commercial success (Reve, 2009).

Porter's work on clusters has influenced and inspired policymakers all over the world, and his model is being used as a tool for promoting regional competitiveness, innovation and growth (Fløysand, Jakobsen, & Bjarnar, 2012). The clusters have the potential to affect competition by increasing productivity of the companies in the cluster, by stimulating new business in the field and by stimulating innovation. In his description of his diamond model of national advantage, he states; *"the diamond is a mutually reinforcing system where each element interacts with and reinforces the others"*. The value creation potential of industries is derived from the configuration of their diamond. Competitive advantages are created in the interplay between company rivalry, factor conditions, demanding customers, and the quality of related and supporting sectors. Further on, two residual influences also have an effect, the role of government and chance or "luck". The clusters that are characterized by favorable conditions in these attributes will constitute a mutually reinforcing system and the net result is a high level of cluster dynamism (Michael E Porter, 1990).

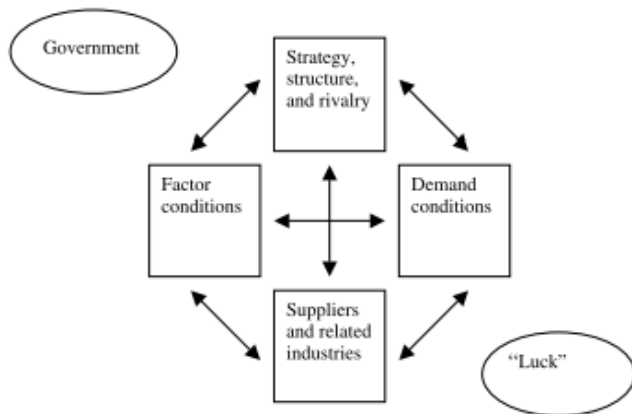


Fig. 1. Determinants of competitive advantage (Porter, 1990).

Focusing on a policy that promotes the factors in this model, may lead to the development of companies with strong competitive abilities. Alternatively, it can lead to the cluster attracting companies with these abilities. The result is that competitive advantages not only lie within companies or even inside industries, but can also be found in the location of the company. When a company is surrounded by a strong cluster of world-class buyers, suppliers and related industries, its competitiveness increases (Michael E Porter, 1990). The more dynamic the cluster is, the more embedded, autonomous and internationally oriented its subsidiaries is likely to be. According to Svetina (2005), the main characteristic of a cluster is that it brings together firms, universities, organizations within the public sector, and R&D institutions. The result is that these firms gain competitive advantages, which are not available for firms that are not located in clusters.

Globalization and technological development have in some cases decreased the importance of geographic proximity, but the increasingly complex, knowledge-based and dynamic economy has led to that instead of diminishing the importance of location, it has become more important than ever before (Michael E Porter, 1998). Virtual communication and similar technologies have made tacit knowledge and close personal relationships between economic agents, key determinants for the competitive success of firms. The flows of specialized knowledge and rich knowledge interactions that leads to innovations is stronger between agents in the same spatial group than among geographically dispersed firms (Morosini, 2004).

#### **4.4.1 Cluster externalities**

According to Porter (2000), there are at least four kinds of externalities that can be identified for a firm located within a cluster that can enhance their competitiveness:

1. Location within a cluster can provide the firm “*with superior or lower costs, access to specialized inputs such as components, machinery, business services, and personnel compared to vertical integration, formal alliances with outside entities, or ‘importing’ inputs from distant locations*” (Porter, 2000, p. 22).
2. Location within a cluster can provide the firm with superior access to all kinds of information, i.e. both technical information and/or marketing information.

3. Location within a cluster can provide the firm or a group of firms with the possibility to take advantage of several marketing complementarities such as joint trade-show participation, firm referrals and joint marketing delegations.
4. Location within a cluster can help to facilitate the firm's access to institutions and public goods that without the cluster would not be easy or cheap to access (Reid, DeMartino, & Zyglidopoulos, 2005b).

The cluster externalities can have several possible effects on the competitiveness of a firm located within the cluster. The main purpose of this research is what kind of influences the cluster externalities can have on the internationalization process of a cluster firm, and in the following sections I will look more in-depth into theory regarding this subject.

#### **4.4.1.1 Effect on inward internationalization**

As a region become more and more specialized in a particular sector, foreign investors are attracted to these locations. The motivation for the foreign firms to locate major operations in the leading edge cluster differs. It is partly a function of the economies of agglomeration that exist in such a cluster, the specialized labor force, the specialized suppliers and the knowledge spillovers. Further on, it can be because presence in the cluster gives them credibility. These economic and institutional logics are self-reinforcing, meaning that once a cluster has established its leadership and become a leading edge cluster, it will attract further investment which again will strengthen its leading position (Birkinshaw, 2000). This attractiveness of foreign investors thus makes the cluster stronger which again makes it easier for the firms within the cluster to internationalize.

#### **4.4.1.2 Effect on internationalization**

The already mentioned cluster externalities that enhance the competitiveness of the firms involved will also have a positive impact on the internationalization process of these firms. The study "*the Internationalization journey of a high-tech cluster*" (Reid et al., 2005b) found cluster reputation to be the most important cluster externality for a cluster firm that wants to internationalize. In addition they also found that access to a specialized labor force, a scientific infrastructure and access to the informal network of firms in the cluster were all factors that had a positive impact on the competitiveness and the internationalization ability of cluster firms. The

importance of the informal network is once again in line with the recent theory of Johanson and Vahlne (2009), and especially for smaller firms, the network relationships are useful or even crucial when it comes to initiating firm internationalization (Sandberg, 2008).

Reid, DeMartino & Zyglidopoulos (2005) also argues that financial, managerial, informational and competitive constraints that the resource poor SMEs meet can be reduced by cooperating with or being part of a cluster. The international experience that becomes available in a cluster is also important. Experience was already in 1977 highlighted as the most important factor for a firm that wants to internationalize (Johanson & Vahlne, 1977), and through locating in a cluster where there are firms with international experience and labor markets that are highly international in their scope, it becomes easier to get access to this experience (G. A. S. Cook & Pandit, n.d.). By being embedded in networks that are international in scope, firms can smooth the path of internationalization. Porter (2000) also highlights how a cluster may hold resources that SMEs may leverage to initiate and/or to accelerate their internationalization activities. He lists a range of resources such as:

1. Specialized input suppliers
2. Distribution channels and logistical services that serve oversea markets
3. Universities, think tanks, trade associations, and standard setting bodies that can provide the firms with knowledge and expertise that is critical to enter foreign markets
4. A labor pool with the expertise and experience to conduct international business (Libaers & Meyer, 2011)

#### **4.4.1.3 Cluster reputation**

One of the cluster externalities that have proved to have a positive impact on the internationalization process of the cluster firms is the reputation of the cluster (Porter, 1998, 2000). Corporate reputation refers to “*the overall estimation in which a particular company is held by its various constituents*” (Fombrun, 1996: 37), and is one of the most strategically significant resources of a firm (Fombrun, 1996). Cluster reputation can be argued to hold some of the same importance because when a firm lacks corporate reputation they can, in some circumstances, lean on the reputation of the cluster they are part of instead. Cluster reputation refers to the



esteem in which a particular cluster is held by various constituents for its expertise in the specific field practiced by the interconnected firms and institutions of that locality (Zyglidopoulos, DeMartino, & Reid, 2006 : 81). Zyglidopoulos et al. (2006) argues that when a firm can rely on the reputation of the cluster they are part of, instead of spending time and resources on developing their own brand and reputation abroad, they can use their resources on developing their competitive advantage. According to Peteraf (1993), cluster reputation can be considered to be more beneficial for SMEs than for the larger companies in the cluster, and for the SMEs it can be considered to be a strategic organizational resource that has the capability to generate a sustainable competitive advantage.

In the study “The internationalization journey of a high-tech cluster” (2005), Zyglidopoulos, DeMartino, & Reid analyze a cluster of smaller imaging and optics companies in Greater Rochester, outside of New York. They look at how cluster reputation can assist the internationalization process of SMEs and they list three different ways:

1. By reducing the legitimating expenses required by a new firm
2. By allowing a firm to charge premium prices and position itself on the higher end of its respective market
3. By facilitating the finding (or the “being found”) by customers

In their article, “*Cluster Reputation as a Facilitator in the Internationalization of Small and Medium-Sized Enterprises*”, Zyglidopoulos et al (2006) go more in-depth and presents a model that shows two ways, a direct and a indirect way, that a solid cluster reputation can assist firms, and in particular SMEs, in their internationalization efforts:

1. Directly alleviates the internationalization constraints that SMEs face
2. Has an indirect positive effect on internationalization through its influence on the other cluster-specific factor conditions

A solid cluster reputation can directly assist SMEs in dealing with the resource constraints they typically face while going international, such as lack of capital and lack of international business

experience. Further on, a solid cluster reputation can also help the SMEs by reducing their managerial and competitiveness constraints. SMEs are generally in a disadvantageous position when it comes to their ability to attract and maintain highly skilled personnel. The larger well-reputed corporations can use their position and reputation to attract talented and skilled managerial and scientific personnel. Being part of a cluster with a solid reputation can help to reduce this disadvantage for the SMEs and help them to attract and keep the personnel that is needed (Zyglidopoulos et al., 2006).

The way cluster reputation can facilitate attracting and keeping talented and skilled employees has a positive impact on the firm's ability to internationalize. By looking at the internationalization process from a stages approach (Johanson and Vahlne 1977, 1990), one could argue that the way cluster reputation increases the ability of SMEs to attract experienced managerial personnel will increase the probability that the firm will attract managers with international experience. The result is that the firm's potential to internationalize will increase. By looking at the internationalization process from a network perspective, attracting and keeping the talented and experienced managers mean that the firm will also attract and keep their international contacts (Coviello & Munro, 1995; Johanson & Vahlne, 2009). These contacts will assist the firm in its internationalization efforts.

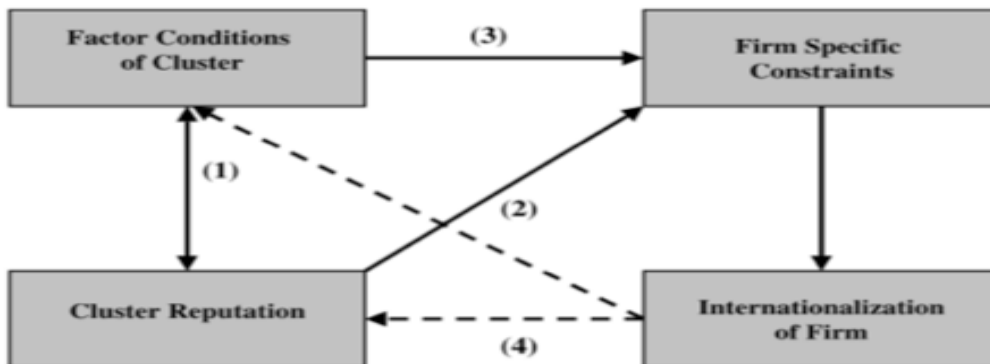
There are many ways cluster reputation can assist SMEs in reducing the financial constraints of internationalizing. For a potential investor, financing a relatively unknown SME is often seen as risky. If the SME under consideration is located within a well-reputed cluster, it may be seen as less risky, and cluster reputation thus acts as a surrogate for corporate reputation (Zyglidopoulos et al., 2006). Further on, Suchman (1995) argues that cluster reputation can help the firm to save expenses that is involved in legitimizing the firm in the customer's eyes, and instead of building a reputation of its own, they can take advantage of the reputation the cluster has obtained. In order for a SME to be able to sell in foreign markets and to be accepted by potential foreign collaborators, the firm must be able to prove their legitimacy in their respective fields. Proving this is associated with costs (ISO certifications, sophisticated web-sites, advertising campaigns

and so on), which the SMES often cannot afford. Cluster reputation can in these cases assist to reduce the legitimation costs because the location in a particular cluster can act as a “guarantee” that the firm at least meets the minimum requirements to be in that field (Zyglidopoulos et al., 2006).

In addition to the mentioned direct ways, a solid cluster reputation can also indirectly assist the internationalization of cluster firms. This can be done through its influence on the other factor conditions within the cluster and by enabling the cluster to attract valuable resources that local firms can draw on. Cluster reputation can contribute to attracting qualified personnel to the area because skilled and trained individuals will find it less risky to relocate to a well reputable cluster area. The specialized labor force of a cluster plays a significant role in the internationalization of firms, particularly for the SMEs, by alleviating their managerial and competitiveness constraints (Zyglidopoulos et al., 2006). Cluster reputation helps to attract information to the cluster, and if an international firm is looking for a purchase or an alliance they will often start their search in areas that are known for their expertise within the specific field the firm is operating in. Therefore it is reasonable to expect that cluster reputation will help to increase the pool of information that is available within the cluster. The result is that it becomes easier and less costly for cluster firms to get information through their own informal and formal networks, and the likelihood of coming across the particular piece of information they might need in their internationalization efforts increases (Zyglidopoulos et al., 2006).

Cluster reputation is also likely to increase the inward internationalization to the cluster since more foreign investors become aware of the cluster and firms within the cluster. I have already mentioned how cluster reputation can reduce the perceived uncertainty of investing in an SME and the result is that more foreign investors will invest in firms that are part of a well-reputed cluster. The effects of inward internationalization have been discussed earlier in the thesis in section 4.2 and 4.4.1.1.

As can be seen from the model below, cluster reputation directly impacts the constraints of SMEs (arrow 2) and, at the same time, through its impact on the other factor conditions of the cluster (arrow 1), it impacts yet again, indirectly, the firm’s internationalization constraints (arrow 3). In addition, there is a positive feedback loop between the internationalization of the cluster firms and the cluster’s reputation (arrow 4) (Zyglidopoulos et al., 2006).



#### 4.4.1.4 Cluster knowledge

One of the most important aspects when looking to internationalize a firm is the access to market knowledge. Researchers often distinguish between two types of market knowledge, explicit knowledge and tacit knowledge. Explicit knowledge is regarded as demographic data, macroeconomic statistics and other identifiable market measures (Eriksson, K., Johanson, Majkgard, & Sharma, 1997), and this is knowledge that either has been or that has the possibility to be transferred from one unit to another. A typical example of explicit knowledge is databases. The tacit knowledge is by Wagner and Sternberg defined as “*practical knowledge, that cannot be expressed or declared openly, but is implied or simply understood, and is often associated with intuition*” (Wagner & Sternberg, 1985). This knowledge is more hidden and more experiential-based than the explicit knowledge, and is for example needed to analyze and understand the above-mentioned databases of explicit knowledge. Tacit knowledge tends to be more difficult to acquire than explicit knowledge, but it can be very useful for a firm in the internationalization process since it can be used to navigate the intricacies of different cultures, socioeconomic system and political regimes that firms often meet when they approach new foreign markets (Eriksson, K. et al., 1997).

Cluster knowledge can be characterized as the clusters' ability to develop and share the knowledge among the participants in the cluster. Porter (2000) highlights cluster knowledge as one of the most important features of being part of a cluster. The importance of market knowledge for a firm's internationalization process has already been highlighted, and Coviello & McAuley (1999) argues that firms might take advantage of the network relations between firms when internationalizing. According to Bathelt et al. (2004), spatial proximity makes it easier to get access to and to share tacit knowledge, and this information exchange can help firms within the cluster coming across information which is needed in their internationalization process (Coviello & McAuley, 1999).

#### **4.4.1.5 Knowledge development and knowledge sharing**

A good and efficient system for developing and sharing knowledge between the firms within the cluster can be a competitive advantage for the cluster as a whole. It will make it easier and less resource demanding for clustering firms to acquire information from both their formal and their informal networks. Appleyard (1996 p. 3) defines knowledge sharing as "*the transfer of useful know-how or information across company lines*". If a clustering firm is able to exploit the knowledge sharing in the network, it may give the firm a competitive advantage over firms that are not part of such a network. Shared knowledge enables the cluster firms to continuously combine and re-combine similar and non-similar resources in order to produce new knowledge and innovations (Bathelt et al., 2004).

Knowledge sharing happens in many ways and the most common ones are through technology spillovers, movement of people and informal exchange (Tallman, Jenkins, & Henry, 2004). Geographic proximity is crucial for knowledge development and knowledge sharing. The proximity leads to a strengthened communication between the cluster members and it is clear that the proximity makes you meet in different contexts and exchange information. Bathelt et al. (2004) label this way of sharing knowledge as "buzz". The buzz can be everything from sharing of new market knowledge, to sharing of new technologies to sharing of cultural traditions. In an article from 1995, Gertler points out that simply "being there" is of utmost importance for a firm that wants to get access to and contribute to develop knowledge (Gertler, 2001). The importance

of social capital and its effect on knowledge sharing was discussed earlier in this thesis in section 4.3.

## **5 Methodology and data collection**

As this thesis concerns an exploratory problem, I have conducted a multiple case study, where in-depth interviews were found to be the most appropriate research instrument. Due to the way the case research approach uses direct observation and systematic interviewing to gather data, it is considered to be an appropriate research methodology for organizational studies. According to Yin (1989), this is particular the case when “why” or “how” questions are being posed.

Interviews were conducted with managers of companies within the cluster, and also with experts within the field of clusters and internationalization processes. In order to be able to compare the results from the interviews, I decided to only focus on companies that already have, or that currently are in the process of establishing themselves in Brazil. Further on, I have chosen to conduct interviews with two of the large companies and five of the smaller ones in order to be able to analyze if there are any differences in their experiences. The interview process was conducted through a semi-structured interview guide. The qualitative nature of this methodology can open up for general criticism regarding a lack of objectivity in the analysis of the data and a lack of structure in procedure and research design. To overcome this potential shortcoming, I will provide a thorough description of the entire research process.

### **5.1 Research design**

I have chosen a case study research design for this study. This was chosen due to the rather abstract nature of the thesis where I seek to uncover how being part of a cluster affects the companies in the process of internationalization. The case study research design has proven to be useful for testing whether a specific theory actually applies to a phenomenon in the real world. Easterby et al. (Easterby-Smith, Thorpe, & Jackson, 2010) argues that the research design should justify and explain what data that needs to be gathered, how it should be gathered and from where it should be gathered. The focus of this research is based on one cluster, and the internationalization process towards one country, and therefore the research design considered to the most appropriate is a case study. According to Eisenhardt & Graebner (2007), the main

idea behind a case study is to look at different cases and through that be able to develop theory inductively. There are different opinions among academics and researchers regarding the right way to perform a case study. For this study, the constructionist research design was chosen. This philosophical type of design assumes that *“there is no absolute truth, and the job of the researcher should be to establish how various claims for trust and reality become constructed in everyday life”* (Easterby-Smith et al., 2010). The NODE cluster is chosen as a case due to its unique position as one of the few Norwegian clusters that is able to compete on a global level. Brazil is chosen as a case due to its position as a major recipient of FDI from the companies within the NODE cluster. I am aware of the fact that by choosing a case study, the results may not be generally applicable as every case is set in a particular context with unique characteristics. Some observations may, however, be highlighted and addressed for further research.

## **5.2 Data collection**

Since little research has been done on the exact topic of this thesis, the interviews in most cases became my primary source of data. The main basis for the analysis is thus the material that has been collected through the interviews. However, secondary data that affects the topic has been used as complementary sources when needed. This data has been obtained from Internet homepages, various reports and informational brochures from the different firms. The secondary data has served different purposes. Firstly, it has helped to enhance the knowledge about the firms prior to the interviews, and secondly, it has been used to help verify the information that I received from the interviews.

## **5.3 Unit of analysis**

As this thesis is a qualitative study of the NODE cluster and the cluster's effect on the internationalization process of the companies involved, the samples were chosen among the various companies involved in the NODE cluster program in the southern part of Norway. Further on, the internationalization process towards Brazil was chosen as a case example, and this limited the number of potential participants to approximately 15. In order to answer the research question, I chose my respondents on a selective approach. I picked both SMEs and large corporations from different positions in the value-chain. When I approached the respondents within the companies, I aimed to get in touch with managers who had experience from the

internationalization process towards Brazil. Other players like Innovation Norway (Rita Schage) and the NODE management (Kjell O. Johannessen) were introduced to the thesis, and contributed by suggesting interviewees and by giving general background information about NODE and the Brazil project. 10 NODE companies received an invitation to participate in my research and 7 of them responded positive and decided to participate.

#### **5.4 Research instrument**

According to Easterby-Smith et al., in-depth interviews provide the researcher with the opportunity to get a deeper understanding of the research area and fits well with exploratory research design. Easterby-Smith et al. (2010) identifies three different forms of interviews, where the difference lies in the structure of the interview. The interviews are divided into unstructured, semi-structured and highly structure. Highly structured interviews are usually standardized interviews based on a carefully planned set of questions. Semi-structured and unstructured interviews on the other hand allow the subjects to be more open and more personal in their interviews.

In this thesis, I found that one of the latter to be the most suitable style of conducting these interviews. Highly structured interviews are likely to give you fixed answers and you will have a few sets of options to choose from. The argument against the unstructured interview style is that this “non-directive” interview style will lead the subject to speak freely without any interruption. The danger with this is that the interviewer may not be able to obtain a clear picture of the issues of interest and thus it will not add value to the research. Therefore, I have decided that a semi-structured interview style is the most suitable methodological approach for this thesis. This approach provides me with the opportunity to have a conversation with the respondent, and to get info from both direct questions planned in advance, and also be more spontaneous and dig deeper when needed. The goal is to obtain genuine and authentic knowledge. In the end, this will hopefully give me the insight and information that I need to see if, how, and to what degree the NODE cluster acts as facilitator for the clustering firms throughout their internationalization process towards Brazil.



#### 5.4.1 Interview guide

In a semi-structured interview, one does not use a fixed questionnaire, but instead focus on certain topics that need to be covered throughout the interview. In order to make sure that all topics are covered, I developed an interview guide with questions for each topic, and follow-up questions to the initial questions. This opened up for both conversation and structure. The interview guide was derived from and based on issues from the literature discussed in the literature review in the first part of the thesis.

The semi-structured interview guide is in line with the theory of Jones (1985), as quoted in Easterby-Smith et al. (2008, 142), where he argues that the assumptions and early understandings many researchers starts making prior to the study often change during the process of the research. This is due to the new information and the interesting topics that often appear during the research. A semi-structured interview guide provides me with the opportunity to modify the questions during the data collection, and to assess if there are any questions that needs to be explored further. I started out with interviewing one of the largest and one of the smaller companies, and after this I went through the interview guide and restructured it when it was needed.

#### 5.4.2 The interview

The aim of the interview was to increase my understanding of the cluster effects and how these effects may help the companies located in the cluster in their internationalization process, and further on, to find out how the companies have approached the internationalization of the company in general, and more specifically, the process towards Brazil. Finally, it was also to increase my knowledge of doing business in Brazil and the challenges related to this.

The interviews provided me with an understanding of how the managers' view the situation in their own company, how the internationalization process of the company has been and how they perceive the possible advantages and disadvantages being part of the NODE cluster can lead to in their internationalization process. Further on, it helped me get a better understanding of the

Brazilian oil and gas industry, the challenges that follows when approaching this market, and how being part of NODE can help the companies to overcome these challenges.

To obtain the best possible understanding of the problem at hand it was necessary to explore and encourage the respondents to give detailed answers to the questions and detailed descriptions of the way they have experienced the whole process. In this study, I used a technique called laddering (Easterby-Smith et al., 2010), where I followed up on the answers that the respondents gave, by asking them to reveal more. By asking questions such as “*why did you choose to locate in that exact place*”, “*how was it possible to get in touch with these people*” and so on, it was possible to get the respondents to describe more of what I needed for the research.

Most of the interviews were conducted on a one to one basis, but in some of the cases the company was represented with two respondents. The interviews lasted from one to one and a half hour and were, in agreement with the respondents, recorded using a tape recorder on my iPad. This made it easier to focus on follow-up questions and switching between different topics during the interview. After the interviews were conducted, they were transcribed. Since the interviews were held in Norwegian, they were also transcribed in Norwegian. However, important quotes that could be applied in the thesis were translated into English. Altogether, the interviews and transcripts generated around 50 pages of text.

## **5.5 Past data collection**

After the interviews were transcribed and sorted after topic, the responses were first analyzed independently and thereafter compared with each other. The results were sorted after the different topics that were reviewed in the literature review, and similarities and differences were extracted from the different responses. The research in this thesis is based on one cluster. This means that the most appropriate research design is a case study. I decided to do a cross-case analysis. In a cross-case analysis, the aim is to discover linkages between the cases in order to assessing the generalizability of the findings (Eisenhardt & Graebner, 2007). In this research, these linkages came in the form of themes, where most of them were manifested a priori to the analysis.

## 5.6 Methodological implications

### 5.6.1 Methodological challenges

The most obvious weakness in this research is the fact that an untrained and non-professional interviewer executed the interviews that was needed to gather the data needed. Further on, the lack of pre-testing before the interviews can also be seen as a possible weakness. The interviews were conducted at an early stage of the research process, and I did not have access to respondents within the NODE cluster that could be used for pre-testing. The first interview thus served as a form of pre-test, but it worked out great and only minor changes had to be made to the interview guide before the second interview. After each interview, I analyzed how the interview had worked out and made changes if it was found to be necessary. Further on, the respondents in this research were all part of a highly technical industry. Coming from a business background with limited knowledge about the technology within the oil and gas industry, I had some problems following all of the terminology used during the interviews. To avoid potential problems related to this fact, I gave the respondents a “heads up” on this and asked questions if there was terminology or technical aspects which I could not understand. Finally, there is also a potential risk that I have not gotten in touch with the most valuable respondents for this thesis. I do however believe that the contacts I received from Kjell O. Johannessen, the Project Manager at NODE, prior to this research were the once that were the most appropriate for this research.

### 5.6.2 Validity

Cook and Campbell (1979) divides validity into four different groups; statistical validity, internal validity, construct validity and external validity. The validity of a qualitative research paper is to what degree the data used can be seen as accurate and whether they are seen as the appropriate data with respect to the chosen research question (Rossomando, 2005). In other words, when looking at the validity of a research, you are concerned with whether the research is finding the truth and if it is measuring what it wants to measure. Construct validity concerns how the data that is used is a good measurement of the research topic, and in this study, the construct validity is represented by the degree the conducted interview data corresponds with the true meanings of the respondents. According to Yin (1989) there are three ways to ensure the validity of a case study research;

1. Use multiple sources of evidence
2. Establish a chain of evidence
3. Have the key informants to review a draft report of the case

In order to increase the validity of this report, I took several precautions. By being there physically when the interviews were conducted, it was possible to see the reactions from the respondents and to ask them follow-up questions when I found it necessary. I used multiple sources of evidence for the research, five SMEs and two large corporations. Further on, I established a chain of evidence for the data used in the research. The chain of evidence consists of transcripts of the conducted interviews together with mp3 files that were recorded during the interview by using an application called Mrecorder on my iPad.

### 5.6.3 Reliability

Reliability deals with the stability of the measure and whether it is possible to obtain the same results every time we measure the results. The research becomes more reliable when there is consistency over time and when there is an accuracy in representativeness of the population (Golafshani, 2003). According to Kirk and Miller (1986) there are three different types of reliability that can be identified from a qualitative study:

1. The degree to which the measurement remains the same
2. The stability of the given measurement over time
3. The similarity of measurements within a given period of time

According to Golafshani (2003, p. 601) the purpose of evaluating the quality of quantitative and qualitative studies is different. The quality concept of a qualitative study is its ability to “generate understanding”, while the quantitative study is meant for the “purpose of explaining”. Thus, some have argued that the notion of reliability is both inapplicable and irrelevant when it comes to qualitative research. Golafshani (2003, 601) supports this view and cites Stenbacka who states, “*The concept of reliability is even misleading in qualitative research. If a qualitative study is discussed with reliability as a criterion, the consequence is rather that the study is no good*”.

#### 5.6.4 Trustworthiness

The problems of measuring the validity and reliability of a qualitative study make trustworthiness of the study extremely important. The idea of discovering the truth through measures of validity and reliability is replaced by the idea of trustworthiness of the research, and by making sure to establish confidence in the findings (Lincoln & Guba, 1985). A qualitative study must be trustworthy and of good quality in order to be considered as good and useful. This was emphasized throughout the whole period working on this thesis.

## 6 Analysis

In this chapter I will present the research findings. The qualitative nature of this research, with in-depth interviews of several companies, generated an enormous wealth of information. The challenge with this wealth of information is that on the one hand, I want to elaborate as much as possible on the findings of the research and do not want to fail to report important findings, and on the other hand, I do not want to lose the reader in the details. Consequently, I decided that the appropriate strategy for the presentation of my findings was a middle road between simplification and elaboration. I tried to implement such a strategy by categorizing my findings around four themes. First, I briefly present the companies that were involved in the research. Second, I present my findings on the NODE cluster. Third, I present my findings on the various cluster externalities that can have an impact on the internationalization of these companies. The final discussion looks more in-depth towards the internationalization process towards Brazil, and especially on how coming from a strong cluster like NODE have helped the SMEs in this process. To make it easier to read and to not disclose names, the respondents will be coded according to the company they are representing.

### 6.1 Introduction of the case companies

#### 6.1.1 National Oilwell Varco

National Oilwell Varco (NOV) is an American multinational based in Houston, Texas. The company is a worldwide leader in the design, manufacturing and sale of equipment used in oil and gas drilling and production operations, in oilfield services and in supply chain integration

services to the upstream oil and gas industry (“National Oilwell Varco,” 2013). NOV Norway AS is a 100 percent owned subsidiary with around 3500 employees in Norway. NOV Norway's headquarter is located in Kristiansand, more specifically, in the area that is known as “the Drilling Bay”. In 2001, NOV bought the majority of the shares of the company then known as Hydralift, and the company became part of a global leader in the offshore industry (“NATIONAL OILWELL VARCO - Offshore Norway,” 2013). NOV has a subsidiary in Brazil, and NOV Norway has worked towards Brazil for several years. In 2011 NOV Norway signed their first contract with Petrobras. The contract, where NOV promises to deliver seven drilling packages is worth \$1, 5 billion. After this, NOV has signed contracts for 15 more of the same drilling packages (Ljosland & Reinersten, 2013). For the rest of this thesis, when referring to NOV, I will be referring to NOV Norway as this is the part of the organization that is the subject for this thesis.

#### **6.1.2 Aker MH (Maritime Hydraulics)**

Aker Solutions ASA is a leading global oil services company that provides engineering services, product solutions, technologies and field-life solutions for the oil and gas industry. The group is organized as a number of separate legal entities where Aker Solutions is used as the common brand for most of these entities. Aker Solutions have been involved in Brazil since the late 1960's, and in 1995 they started their first subsea activities. They quickly became a qualified supplier of Petrobras, and in 2012 they signed a contract for six drilling packages worth approximately \$1,2 billion (Ankersen, 2012). Aker MH is a part of Aker Solutions ASA. The company is located in Kristiansand, right next to NOV in the Drilling Bay. Aker MH delivers world-class deep-water drilling technologies, drilling systems and drilling lifecycle services. Together with their neighbor, NOV, and the newcomer Cameron (also a NODE company), they deliver between 70-90 percent of the world market for drilling equipment.

#### **6.1.3 HERNIS**

Hernis is a Norwegian company with head office in Arendal and subsidiaries in Singapore, Rio de Janeiro and Houston. The company has 160 employees, where the majority is situated in Arendal. They have been working towards Brazil for the last 10-12 years, and have established their own subsidiary in Rio de Janeiro. Hernis develops advanced camera-based surveillance systems for the maritime industry and for oil and gas installations worldwide. Their systems are developed

to both increase efficiency and to provide safety for people and equipment in harsh areas and under extreme conditions. They started with products for the North Sea and this has made them capable to face rough conditions all over the world. HERNIS was in 2011 bought by Cooper Industries, and is now a subsidiary of the Eaton Corporation. They do however still have the freedom to continue their operations as they always have (“HERNIS Scan Systems,” 2013).

#### **6.1.4 On & Offshore Services As**

On & Offshore Services As (OOS) is a Norwegian company with head office in “the Drilling Bay” area in Kristiansand. OOS was established in 2003 by local entrepreneurs with broad experience from the oil service industry. Their area of expertise is within maintenance and modification of offshore installations. Their business model is to employ highly qualified personnel within mechanical disciplines, engineering and project management, and hire them out to oil and gas companies that need extra personnel. In 2007, the entrepreneurs sold the majority of the shares to new owners. A holding company, On & Offshore Holding AS, now owns 100% of the stocks in OOS. OOS have been present in international markets almost since the start, and has for the last two years worked towards taking a larger position in the markets where they are already present, and also towards establishing themselves in Brazil (“OOS - Om oss,” 2013).

#### **6.1.5 AS Nymo**

AS Nymo is a full-service engineering, procurement and construction company within the oil and gas process industry. They offer total solutions to customers located worldwide. Nymo was established in 1946, and was in 1956 fully acquired by the Ugland family (a family from Grimstad with long traditions within shipping and industry). The company has more than 300 employees, and is a cornerstone company in Aust-Agder. The HQ and the main fabrication yard is situated in Grimstad, and there is also an additional fabrication facility in Arendal. Nymo’s special expertise lies within the designing and fabrication of offshore drilling packages. In the last decade, more than a dozen drilling packages have been designed and/or fabricated by Nymo. These modules are highly advanced units that are designed for the harshest environment conditions, as well as subjects to the most severe standards, laws and regulations (“Nymo - About us,” 2013).

### 6.1.6 Bestra

Bestra is a supplier of products and machinery to offshore, marine and industry. The company was founded in 2004, when the founders identified a potential to create a more efficient supply-chain that would be capable of dealing with a more demanding global market. The head office, the sales department, and the project management is located in Kristiansand while manufacturing, machining and hydraulic, and mechanical assembly is offshored and carried out in a wholly owned subsidiary in Estonia ("Company," 2013). At the HQ in Kristiansand there are only seven employees, all of them with key positions in the company. The factory in Estonia has about 50 employees, and they handle all the practical tasks. That way, Bestra can offer their customers the products at a competitive price while at the same time have the local commitment through a Norwegian management that handles negotiations, contracts, legal framework and all the contact with the customers.

### 6.1.7 Noba Tech AS

Noba Tech AS is a joint venture between 3 NCE NODE companies, Bestra, Andersen Mekaniske Verksted (AMV) and Kongsberg Devotek. The company was established in 2010, and in April 2013, they established a Brazilian subsidiary, Noba Tech do Brasil. This company will operate from a region called Ipatinga, just north of Rio de Janeiro. At the same time Noba Tech do Brasil formed a partnership with a Brazilian industrial group called HTS. The agreement includes an exchange of knowledge between the two partners and also includes bringing the HTS workers to Norway for training (Paschoa, 2013). Noba Tech is the first physical result of the agreement between NODE and the cluster in Brazil. Noba Tech is a project that would not have been realized without NODE. The two big companies in NODE, Aker MH and NOV asked NODE if they could initiate a project where the main goal was to get the supplier industry in NODE established in Brazil. Both of these companies have been established in Brazil for quite a long time and have experienced difficulties finding the suppliers they need for their projects there. The strict local content rules on oil and gas projects means that they cannot import everything, and thus they depend on local suppliers in Brazil. The Brazilian supplier industry is for now, not capable of doing this one their own, and this is where Noba Tech comes in. NODE, with support from Innovation Norway, initiated the project and three companies without any previous history



together decided that they were to go together and form a new company in Brazil. In practice, all of the three companies could have been competitors, now they are collaborating (Taraldsen, 2013).

## 6.2 Cluster theory

There are several definitions of industrial clusters, and also several models describing what conditions that are needed for a cluster to succeed. Michael Porters' theory on the subject is the one with the widest recognition, thus it was the one that was deemed to be the most appropriate to use for this research. As discussed in the literature review, Porter's diamond model of national advantage has been given a great deal of attention by governments around the world. The idea is that by configuring the diamond in the ideal way, it will maximize the value creation potential of an industry. It creates competitive advantages through the interplay between company rivalry, factor conditions, demanding customers, and the quality of related and supporting sectors. Further on, two residual influences also have an effect, the role of government and chance or "luck" (Michael E Porter, 1990).

### 6.2.1 NODE

In this thesis, I will not go into an in-depth cluster analysis of NODE. This have been done before ((*Fra rivalisering til fruktbart samarbeid og sunn konkurranse: Evaluering av NODE*, 2009), (*Evaluering av tre NCE-prosjekter 2013*, 2013)) and is not the objective of the thesis. I will however shortly present the result of these analyses and shortly present my findings.

The result of these analyses is that NODE can be characterized as a world class leading cluster. The cluster is being used as a benchmark of best practice when the government in Brazil and the region Ipatinga now are looking to establish their own cluster (Taraldsen, 2013). Further on, in 2012 NODE and leader Kjell O. Johannessen received international recognition for their success when NODE was awarded with the Cluster of Excellence Gold Certificate at the European Cluster Conference in Vienna ("Klynge får gull-sertifisering," n.d.). Finally, when Torger Reve, a leading Norwegian expert on cluster theory, identifies the Norwegian "super hubs" or Global Knowledge Hubs as he labels them, NCE NODE is highlighted as one of Norway's two Global Knowledge Hubs (Reve, 2011).

Based on the information from secondary sources (NODE's website, newspaper articles and reports) and from the primary sources (interviews with companies, Innovation Norway and Kjell O. Johannessen of NODE) it seems clear to me that NODE fulfills all the characteristics that Porter includes in his definition of a complete industry cluster. The companies within the cluster are located in a small geographic distance (from Flekkefjord in the west to Arendal in the east), with the vast majority of them located in Kristiansand. Further on, the cluster consists of several specialized suppliers, service providers and firms in industries that are related to the oil and gas industry. The cluster has a link to, and collaboration with important institutions such as the University of Agder (UIA) and Innovation Norway. Several of the interviewed companies highlights how the link to and collaboration with UIA is crucial for NODE to maintain their position as a world leading technology cluster. Finally, all of the companies emphasizes the importance of how the companies within the cluster have gone from "only" competing and rarely talking to each other, to a situation where they compete on a lot of things, but also cooperate when cooperation is needed or seen as beneficial. The cluster is built up on a combination of companies that are direct rivals and companies that targets different segments of the industry, and these companies complement each other.

All of the interviewed companies (except from Noba Tech who only operates in Brazil) stated that they have competitors within the cluster, but I find that they differ somewhat in terms of the degree of the competition. Companies like NOV and Aker are direct competitors, while the others are competing on parts of their operations and services but without the direct competition that is seen between NOV and Aker. The smaller companies also perceive the competition a bit different than Aker and NOV, they do not focus that much on it, and it seems like they want each other to succeed. There is a wide agreement between the interviewed companies that the success of other clustering firms is inspiring and motivating. This quote from the representative from Bestra paints a good picture of the way the smaller companies looks at the competition within the cluster: *"We look at the market as global, and the companies that are located around us in the Kristiansand/Agder area are not considered to be competitors, but collaborators and partners. The*

*world and the market is so large, and Kristiansand is just "a spot in the middle of nowhere". If you put your efforts into competing and "fighting" with your neighbor instead of focusing on the competition from China and other low-cost countries, both of you are likely to lose.*" I find that the cluster can be characterized as far more collaborative than competitive focused, but between some of the companies, and on some aspects of business, there is also intense competition. This combination of close cooperation and intense rivalry fosters innovation and entrepreneurship with a dedication to commercial success (Reve, 2009).

The diamond model seems to have been configured in an ideal way for NODE. Not only is the cluster scoring high on the four dimensions, which has given them a competitive advantage compared to others that are not part of the cluster, but the cluster is also scoring high on the residual influences; the role of government and chance or "luck". The local government has been supportive to the industry, and the cluster has been granted national support through being part of the Arena project at first, and now the NCE project. The chance or "luck" residual has probably been even more important. The last fifteen years, the oil price has gone from around USD \$20 to USD \$100. Higher oil price leads to higher demand for the products and services provided by the NODE companies. Still, it is extremely impressive that Sørlandet, a region without oil, have become the leading supplier of drilling equipment in the world, and this can not only be contributed to the rise in the oil price, the cluster have done a lot of things right.

Representatives from Aker and Nymo highlights how NODE have contributed to the companies getting their voices "heard" and now have an influence on important institutions such as UIA and on politicians, both locally in Agder and on a national level. As the cluster has grown stronger, so has its possibility to influence politics, and the representative from Aker points out that the next step could be to use this on an international level, for instance on making it easier for Norwegian companies to operate in Brazil. Aker further emphasize that what the NODE organization has done is to set the networks that existed in the region for many years, into a system. The result have been less conflict between the clustering firms, more collaboration, and an arena where the participants can meet and have an informal talk, discuss new market opportunities, challenges in

the future and also an arena for creating new innovations. However, it is important to point out that becoming a part of NODE does not mean that you get free access to the market and immediately gets contracts with the big companies within the cluster. The representative from OOS stresses that if you become a member of NODE, you are not secured to get a contract with Aker or NOV or other companies within the cluster. What you do get is a chance to meet the right people, to build relations and through this you might get the opportunity to showcase yourself and what you have to offer. These findings is in line with the new Uppsala model, reviewed in 4.1.2.3, where the role of networks is showed to play an increasingly important role for companies, and especially for companies that is operating internationally.

I find that NODE is indeed a world-leading cluster. Further on I find that the success of the cluster probably can be contributed to many factors. The growth in the marked, the local competition combined with the collaboration, the strong base of technology and knowledge within the cluster, the NODE organization and its leader, Kjell O Johannessen, the governmental support, and as I will come back to later in the analysis in section 6.3.4, the fact that so many of the companies are owned by large multinational companies with international experience and a global network. All of these factors have contributed to the success of the cluster. The success of the cluster can be seen in light of Porter's (2000) claim that proximity in geographic, cultural and institutional terms will help the clusters to succeed on a global market because these factors allows them to have special access, special relationships, powerful incentives, better information, and other advantages in productivity and productivity growth that are difficult to get access to, and tap in to if you operate from a distance and are not part of the cluster.

## **6.3 Cluster externalities that can facilitate the internationalization of firms**

### **6.3.1 Cluster knowledge**

Cluster knowledge can be characterized as the clusters' ability to develop and share the knowledge among the participants in the cluster. Porter (2000) highlights cluster knowledge as one of the most important features of being part of a cluster. For a firm looking to internationalize, access to market knowledge is crucial. As discussed in the literature review, researchers distinguish between two types of market knowledge, explicit and tacit, where the

explicit knowledge is knowledge that has the possibility to be transferred from one unit to another, while the tacit knowledge is more hidden and more experiential based. The tacit knowledge tends to be more difficult to acquire than the explicit knowledge, but in the internationalization process it can be very useful since it can be used to navigate the intricacies of different cultures, socioeconomic systems and political regimes that firms often meet when they approach new foreign markets (Eriksson, K. et al., 1997). If you have a superior product, like the drilling products sold in NODE (ownership advantages) and the potential market holds some locational advantages, like the natural resources in Brazil, the tacit knowledge is needed to internalize all the possible advantages by internationalizing to Brazil. This knowledge should be easier to get access to if you are part of a cluster, and that is part of the reason for why geographic proximity is so important and why globalization, online-databases, new technology and so on, not have diminished the importance of geographic proximity (Porter, 1998).

#### **6.3.1.1 Knowledge sharing within the cluster**

By analyzing the interviews it is clear that knowledge sharing takes place in various ways within the cluster. Tallman et al. (2004) argues that the most common ways of knowledge sharing are through spillovers, informal exchange and through movement of people. I find that all of these ways are important also in NODE, but that the informal exchange seems to play an extra important role, especially for the sharing of market knowledge that is so important for a firms' internationalization process.

From my research it is evident that there is a positive attitude towards knowledge sharing within the cluster and all of the companies represented in this study have experienced some form of knowledge sharing. This finding is in line with the literature where Porter (1998) argues that extensive technical-, market-, and competitive information will accumulate within a cluster, and that the members of the cluster will have preferred access to this information.

However, the degree of knowledge sharing is perceived differently among the interviewed companies. The representative from Aker points out that they at the moment are not sharing any particular information, but that they would gladly have done it if someone had asked. Brazil is

highlighted as an example of a difficult place to do business and the respondent points out the many examples of companies that have tried and failed in Brazil. To succeed in Brazil, he claims that you will need to put in a real effort and you need to be aware that it will take both time and resources to succeed. *“If a company in the cluster would be willing to put in the effort needed to succeed in Brazil, like Noba Tech is doing today, we would be more than willing to help them by sharing our knowledge and experiences and also by putting them in touch with the right people. For us, it would be a great advantage if more companies from NODE or Norway in general would succeed in establishing themselves in Brazil, and thus it would be natural for us to help them in doing so”*. The representative from NOV, the other big company in the cluster, points out much of the same as Aker, they would be more than willing to share their knowledge about their experiences in Brazil and other markets, but as of today they have not experienced many requests for this, at least not for knowledge related to internationalization. The respondent points out that by sharing experiences, it can be possible to avoid stepping into the same pit-falls.

The representative from Noba Tech points out much of the same, but I find that they, along with several of the other SMEs, differ somewhat in their experience of how much knowledge that is currently shared within cluster. He states, *“If another company within the cluster wants to look into the Brazilian market, it is not unusual that we make a phone call, talk to each other and help each other out”*. Further on he emphasizes the fact that if you contribute to the cluster by sharing knowledge and experience, you are likely to get something back as well. This view is supported by the representative from OOS who claims that there will always be someone that contributes less than others, but their experience is that those who contribute also gets rewarded for their contribution. I find that the SMEs have a somewhat different experience then the large corporations in terms of the degree of knowledge sharing within the cluster. It could be that the SMEs within the cluster find it easier to contact other SMEs for sharing of knowledge and experiences. It can be hard to locate the right people to talk to in the large organizations, and it might be a bit more “frightening” to approach these companies. On the other hand, it could also be that Aker and NOV are so big organizations that even if the representatives used for this study

did not have any experience with knowledge sharing, other representatives within the company might have.

#### **6.3.1.2 How is the knowledge shared?**

Theory states that a good and efficient system for developing and sharing knowledge between the firms within the cluster can be a competitive advantage for the cluster as a whole. De Martino et. Al. (2006) recommends the cluster to develop a “pool in information” that is available for the clustering firms. The claim is that this can make it easier and less costly for cluster firms to get information through their own informal and formal networks of acquaintances and contacts. I find that there are no formal systems for knowledge sharing in NODE today, but several of the interviewed companies liked the idea of a more formal nature of the knowledge sharing. They claimed that such a system would be a good idea and something they would both have contributed to and something they would have used actively in their internationalization process.

However, it must be noted that these pools of info would in general consist of explicit knowledge since this is the kind of knowledge that has the possibility to be transferred from one unit to another. Theory states that this kind of knowledge is no longer a typical source of competitive advantage, and the sharing of this knowledge is not the reason for why the clustering firms succeed (Porter, 2000). It could obviously be nice to have access to this knowledge, but it could be argued that it is possible to access this knowledge through online databases, different country reports and so on, and that for the cluster to focus on developing such a system would not be a good use of resources. I find that since you do not need to be part of a cluster to get access to this kind of knowledge, the sharing of explicit knowledge is not the most important way being part of a cluster can facilitate the internationalization of a firm.

The channels for knowledge sharing that seems to be most important are the informal channels. Several of the respondents argue that the movement of employees and the flow of potential new employees are important channels for knowledge sharing within the cluster. The representative from Nymo argues that movement of employees within the cluster has both a short-term and a long-term effect. The short-term effect is that the company loses an important employee that it

takes both time and money to replace. The long-term effect however is more positive. The long-term effect is that the region builds up its competence level and if this knowledge is shared, the clustering firms have a competitive advantage compared to non-clustering firms. The result of this kind of knowledge sharing is that new ideas are born and consequently, the cluster remains innovative. This view is not only supported by the SMEs within the cluster, but also by representatives from Aker and NOV. Aker highlights how the fact that the knowledge they have gathered through their many years of international operations can have a positive effect on the cluster as a whole since the movement of employees from Aker to other, smaller companies within the cluster means that the knowledge is brought along and spread around in the cluster. This finding is in line with Tallman et al.'s (2004) theory that knowledge sharing through movement of people is among the most important channels for knowledge sharing within a cluster.

Several of the interviewed companies stresses the importance of the social arenas that are created by the NODE organization. Arenas like "Topplederforum" and "NODE Foresight" are highlighted as important arenas for informal knowledge sharing, and arenas where representatives from the companies can meet and discuss new market opportunities, potential customers, problems they are facing in their internationalization process, trends in the market, future challenges and what the clustering firms can do together in order to make sure that the cluster will stay strong in the future. The representative from Noba Tech points out how you, in these settings meet people that are in the same position as you are and that are facing the same problems as you are, and the result of these meetings can be that you find a new partner that you can cooperate with in overcoming the challenges that you are facing. The representative from Nymo emphasizes that an informal meeting arena like this is pretty unique and something that they would not have had the chance to get access to if they were not part of the cluster. This finding is in line with Johanson and Vahlne's theory of networks and the importance of "insidership", and once again Porters' claim that location has become more important than ever before seems to be confirmed.



The representative from Noba Tech states *"being part of a cluster like NODE makes it easier and less resource demanding for the SMEs to take the step and try to internationalize to a new market. Instead of going step-wise like many companies did in the old days, the companies can use the knowledge that is accessible through many of the clustering firms that have already established themselves, or tried to establish themselves in that respective market. The knowledge is there, it just needs to be shared and be made more accessible for the rest of the cluster. To try to do a mapping of the market in Brazil, without any experience and with limited resources is very difficult"*. The representative from OOS follows up on this and highlights that even if there are no formal channels for knowledge sharing, the informal channels makes up for this. The respondent states *"If I have a problem that I am not sure how to deal with, the first thing I would do is to call a friend in one of the other NODE companies and ask if he has faced the same problem. Most of the people in NODE are good friends and happy to help each other"*. I find this to be another confirmation of how the location of the company can help to get access to the tacit knowledge that has become so important for the internationalization process.

### **6.3.2 Social capital**

It seems to be a widespread agreement among the respondents that there are strong, informal networks within the cluster. The representative from OOS emphasizes the importance of the social ties and states *"when you meet people on your free time, in your neighborhood, on social events and through friends, you talk to each other, and through this, important information and knowledge is exchanged"*. The representative from Nymo points out that when you are located in such a small area as Sørlandet, the chance of meeting business partners, potential new partners or people with information that is useful for you, becomes present in many different contexts. These findings are in line with Coviello's theory (1999) that clustering firms will have a greater chance of coming across the particular piece of information they might need in their internationalization efforts than firms that are not part of a cluster.

According to the representative from Hernis, the result of these networks is that both new ideas and information is exchanged. They have taken advantage of these strong social ties, and the information and knowledge gathered through this informal channel have been of great

importance for Hernis on several occasions, where the businesses in Houston and in Brazil are highlighted as two of these occasions. They point out that it is easier to call a friend or someone you know through your network than it is to call Innovation Norway or other institutions. Further on, Hernis emphasizes how these networks increases the trust between the clustering firms, how it creates transparency and how it makes unethical behavior less likely. This finding is in line with the theory of Laursen et al. (2012) where they argue that the social capital enhances the chances that ties will be established among firms and that it will act as a disincentive for uncooperative behavior since reports of perverse or unethical behavior will spread rapidly in regions that are characterized by extensive social ties. They argue that the social punishment of such behavior may be severe, and I find that the companies interviewed in this study are sharing this belief. The representative from Bestra argues that when you have strong social ties in such a small geographic area, unethical methods in business is a “no go”. This means that the social capital that exist within the cluster is not only acting as a facilitator for sharing and development of knowledge, it also acts as a facilitator for ethical and cooperative behavior. By looking at this in the light of Porters’ theory of the increasing importance of geographic proximity, I see these findings as one more confirmation of his theory.

Laursen et al. (2012) also argues that there is a positive relationship between potential social capital in a region, and the firms’ involvement in foreign markets. The potential social ties plays an important role in facilitating a firms internationalization efforts, and the better the opportunities for knowledge flows within the cluster, the higher is the chance of clustering firms getting involved in foreign markets. This theory is supported by several of the interviewed companies. I have already mentioned how Hernis have used their social ties when they established themselves in Houston and Brazil. The representative from OOS also refers to how they are using their social ties with a NODE company called Southern Marine when they are working towards Brazil, and how they uses the knowledge and experiences they have gathered in order to succeed in Brazil. These findings are also in line with Johanson and Vahlnes’ theory where they show that “insidership” in networks has become the most important source of tacit

knowledge for a firm and how this insidership can compensate for lack of international experience (Johanson & Vahlne, 2009).

Further on, the findings in this part of the analysis seems to confirm Morosini's (2004) theory that tacit knowledge and close personal relationships have become key determinants for the competitive success of firms, and it builds on his argument that the flows of specialized knowledge and rich knowledge interactions that leads to innovations is stronger between agents in the same spatial group than among geographically dispersed firms (Morosini, 2004). This view is not only supported by my findings, but also by Coviello & McAuley (1999) who claims that spatial proximity makes it easier to get access to and to share tacit knowledge, and this information exchange can help firms within the cluster coming across information which is needed in their internationalization process.

### 6.3.3 Cluster reputation

As presented in the literature review, cluster reputation is by several researchers highlighted as one of the cluster externalities that have the most positive impact on the internationalization process of cluster firms (Porter, 1998, 2000). It is interesting to see if the cluster reputation can serve as a substitute for the company reputation so that a firm that lacks corporate reputation can lean on the reputation of the cluster they are part of.

The representative from NOV argues that to them, the corporate reputation is more important than the cluster reputation since they are a company that is too large to lean on the reputation of others. NOV further highlights that to them, the reputation is based on their history. The important thing is that when a potential customer sees that the last time they bought equipment from NOV, NOV delivered top quality, on time. The representative from Aker seems to agree with NOV, and argues that when they are approaching a potential customer, they are marketing their brand and their products. To their customers, the fact that the products come from a cluster called NODE does not seem to be of too much importance, what matters is that they know that Aker delivers the best products on the market. Aker further argues that for the smaller companies, their reference list is probably the most important resource. If they have delivered

products to leading companies like NOV and Aker, they are likely to have an advantage compared to companies without this reference list since these references are seen as a signal of quality.

The representative from Hernis argues that it takes a lot of time and money to build a solid reputation, and that the association to and link to NODE and the companies within NODE can be beneficial for a company that is looking to internationalize. Nymo, a company that in terms of size and revenue can be placed between the small and the two big companies in this study, also places themselves somewhere in the middle when it comes to their view on the importance of cluster reputation. They highlight that they have spent both time and money on the process of building a solid reputation for the company, but they also argue that they have had a huge advantage from their collaboration with the two "locomotives" in the cluster. By doing projects together with these companies, the companies have developed together. They emphasize that the big companies would probably have succeeded anyway, but that NODE as an organization have done a good job in marketing both the NODE organization, the region and the cluster as a whole, and that this is something the SMEs in the cluster can take advantage of.

The way all the companies involved in the study stresses the importance of reputation, either through corporate reputation or through cluster reputation is a confirmation of Formbruns' (1996) theory that reputation can be seen as one of the most strategically significant resources of a firm. I find that there are some mixed perceptions on whether cluster reputation can serve as a substitute for the corporate reputation. It does not seem like it can fully replace a strong corporate reputation, but for a firm without the resources to develop this strong corporate reputation, it should definitely be possible to take advantage of the cluster reputation. I also find that Peteraf's (1993) theory that cluster reputation is more beneficial for SMEs than for the larger companies in the cluster seems to be true.

#### **6.3.3.1 Cluster reputation's effect on internationalization**

As discussed in the literature review, Zyglidopoulos, DeMartino, & Reid (2005) finds that there are three different ways a strong cluster reputation can assist the internationalization process of firms, and particularly SMEs: First, by reducing the legitimating expenses required by a new firm.

Second, by allowing a firm to charge premium prices and position itself on the higher end of its respective market, and finally, by facilitating the finding by potential customers and partners. Further on, Zyglidopoulos et al (2006) divides these ways into an direct and an indirect way. A solid cluster reputation can assist the SMEs directly in dealing with the resource constraints they usually will face while internationalizing. Examples that are highlighted are lack of capital and lack of international business experience. Indirectly, it can assist by enabling the cluster to attract valuable resources that the local firms can draw on.

#### 6.3.3.1.1 Direct ways

The argument is that when a firm lacks corporate reputation, they can lean on the reputation of the cluster. Whether it is possible or not to lean on the cluster reputation if you lack a corporate reputation have been discussed and my finding was that for the SMEs, this can to some degree be possible. The consequence, according to Zyglidopoulos et al (2006) is that the cluster reputation has a direct effect on the internationalization process of these firms. It can help to reduce their managerial, financial and competitiveness constraints. Instead of putting both time and money into building their own corporate brand and reputation abroad, their resources can instead be used to develop their competitive advantage.

##### 6.3.3.1.1.1 Reducing the legitimating expenses

The representative from Bestra claims that it is obvious that coming from the NODE cluster gives an easier access to the market. *"If you have a demanding customer, and your reference list shows that you have delivered your products to two of the world's leading oil service companies, then you start with a 1-0 lead compared to your competitors. The fact that world leading companies are located in our "neighborhood" and that we deliver our products to these companies is seen as a signal of quality"*. The representative from OOS builds on this and states that they are continuously working on building their brand and strengthening their corporate reputation, and that in Norway, this is what is important. However, when they are approaching international customers, and when they now are in the process of establishing themselves in Brazil, the reputation of the cluster is extremely important and helps them to reduce their legitimating expenses. They highlight how "everyone" in the industry knows Aker and NOV, and when OOS can show that they are in fact located right next to these companies, that they are suppliers to

these companies and that they meet the leaders of these companies on a regular basis, it gives them legitimacy and an advantage compared to companies that are not located in the cluster. The representative from Hernis also believes that NODE can be helpful in getting the smaller companies the opportunity to get access to the market by facilitating the opportunity to meet the right people and potential customers. This finding is similar to one earlier in the analysis, in the first part, where I found how OOS and other of the interviewed companies pointed out that being part of NODE can help the companies to get contracts with the local giants, Aker, NOV and Cameron. It does not mean that the companies gets a contract because they are NODE companies, but it facilitates the opportunity to meet the right people and maybe the opportunity to show what you can offer, but after that it is up to the company to deliver high quality products at the right price.

The representative from Aker confirms that when it comes to drilling and drilling equipment, the companies in the cluster are globally recognized. He points out that in the oil industry, there is a lot of exhibitions and states *"if the small companies in NODE can be a part of stand at Rio Oil and Gas arranged by the NODE organization, where the link to the big drilling companies and the Drilling Bay is highlighted, I am positive that this will give the firm a signal of quality"*. He claims that if you have proven that you are capable of delivering your products to these world-leading companies, you have proven that you are a high quality supplier and consequently you will get access to new potential customers or other important persons. However, it must be noted he says, that it is not like the companies from NODE gets anything for free when it comes to delivering their products to Aker. They are chosen because they are the best at what they do.

These findings confirms in many ways Zyglidopoulos et al (2006) theory that cluster reputation can facilitate the internationalization process of a SME by reducing the legitimating costs. The need to advertise, promote them company, and establishing their own reputation is reduced as a direct consequence of NODEs reputation.

#### *6.3.3.1.1.2 Premium pricing*

Theory states that cluster reputation should enable clustering firms to charge premiums prices

and position themselves on the higher end of their respective markets (Zyglidopoulos et al, 2006). Labor-intensive, low-cost, standardized activities are relocated to the developing areas of the world and this puts the NODE companies under intense price pressure. South Korea and Singapore have been competitors (and customers) to the NODE companies for a long time, and China is now emerging as a competitor. Theory states that for the cluster to survive and to enhance its competitiveness in the globalized environment, they must move toward a higher value-added position in the competitive space. Cluster reputation, they argue, can assist to this movement since it can help to attract talent to the area and it can help to generate a “critical mass” of expertise that the SMEs can draw on in their internationalization efforts (Zyglidopoulos et al, 2006).

From the interviews, it seems to be a widespread agreement that being a part of NODE does not facilitate the possibility to charge premium prices. The representative from Aker states that there is no way that they will pay a higher price for a product just because the supplier is a NODE company. The representative from Noba Tech agrees with Aker on this fact, and states that it would not be possible for them to charge a premium price on their products in Brazil, and justify it with the fact that they are a NODE company. However, they argue that it could be possible to take a higher price than some of the competitors if the quality of the product they deliver is higher. Everything else equal, the company with the lowest price is chosen. The representative from OOS highlights much of the same, for the products and services they deliver, the market controls the price and they have to position themselves on the same price range as their competitors. Further on, they argue that for them to have the possibility to charge a premium price, they would have to be positioned as a specialist firm by the market, which is something that they as of today, are not. Finally, OOS also points out an interesting fact; compared to the oil and gas industry in Brazil, Norway can almost be defined as a low-cost country, so for OOS to compete with Brazilian companies on the services they provide in Brazil is not a problem at all. The representative from Nymo states that they do loose contracts to Singapore and Korea, but when it comes to some of the most complicated parts of the projects, the companies still come to Norway. They argue that for these kinds of projects, the Norwegian price level is still competitive,

but for the more labor-intensive projects, the low-cost countries win. The key, Nymo argues, is to deliver products that require a high level of competence, high quality and safe deliveries. This argument and these findings seem to be in line with theory. It is not possible to charge a premium price just because you are a NODE company, but the quality of the products and the competence required to secure this quality and at the same time, be innovative, means that the products and services delivered by the NODE companies will still be chosen over products and services from low-cost countries.

#### 6.3.3.1.2 Indirect ways

##### 6.3.3.1.2.1 *Attract the right people*

Several of the interviewed companies stressed the importance of the ability to recruit the best possible employees, and that this is something that they work with every day. By recruiting employees with international experience and foreign specialists to the company, the internationalization process should go smoother. This recruitment has proven to be more difficult for the smaller companies in NODE, since they are not as recognized outside the region as the two big ones. However, several of the companies' points out that the international success of several of the NODE companies, and the increasing marketing of the NODE cluster as a whole, can act as a facilitator for attracting more talented people to the region. The representative from Nymo argues that the NODE organization has done a good job in marketing the cluster here in Norway, and that this helps to make the region more attractive for potential employees since they see that there is a solid oil and gas environment here. The representative from Hernis agrees with Nymo on this, and suggests that in the future, it should be possible to do the same in international labor markets. They suggest that today, when so many NODE companies are focusing on Brazil, it should be possible to use the NODE organization, the good reputation of the cluster and the clustering firms to recruit engineers from Portugal.

##### 6.3.3.1.2.2 *Facilitating the finding (or the "being found") by customers*

Zyglidopoulos et al. (2006) argues that cluster reputation will attract information to the cluster, regardless of which firm receives it or where in the cluster it ends up. They argue that when an international firm is looking for a purchase or an alliance, they will usually start their search in areas that is know for their expertise within a specific field. Many of the SMEs in the cluster are



not actively involved in trying to locate and sell to foreign customers or in finding foreign partners. For these firms, the cluster reputation can be seen as a “heuristic” that helps to facilitate the search by potential foreign customers, partners or distributors for the right company to do business with. This is how OOS internationalization process towards Brazil started. They got a call from the NODE organization that a Brazilian company were in Kristiansand and they were on the lookout for a Norwegian partner. The representative from Hernis also points out how Aker and NOV are attracting international customers and potential partner companies to the region, and that the smaller companies can take advantage of this. This finding confirms the theory that cluster reputation can facilitate the internationalization process for a SME not only directly but also indirectly.

Overall, it seems that the reputation of the NODE cluster definitely acts as a facilitator for the SMEs in their internationalization process, and that it can be seen as a great advantage for these firms that they would not experience if they were not located within the cluster. The large companies points out that being part of a recognized cluster can be a great advantage for the internationalization process of a firm, but they emphasize how they are managing this process on their own and how the important factor for them is their own reputation.

#### **6.3.4 Inward internationalization**

Further on, inward internationalization seems to play an important role for the success of the cluster and for the clustering firms’ internationalization process. The companies in NODE were domestically owned for a long time, but the cluster is now facing an increasing level of foreign ownership. This development is in line with Birkinshaw’s (2000) theory on the matter, and NODE follows the same steps as other leading edge clusters have done before them. NODEs status as a leading center in the drilling industry makes them a magnet to high quality investments, and they attract key players from both Norway and from abroad. Birkinshaw shows how the presence of these companies can enhance the leadership of the cluster and contribute to its upgrading, and how it can have a positive impact on the cluster dynamics, where the transfer of technology plays a particularly important role. The representative from Bestra confirms this theory, and claims that one of the reasons for NODEs strong position is the fact that many of the companies have

been bought by foreign investors. Bestra emphasizes how especially the American owners, with a leadership style with focus on results and an untraditional, from a Norwegian point of view, way of running the company have played an important role in lifting the companies and the cluster to a new level. The representative from Bestra further confirms Birkinshaw's (2000) theory that inward internationalization plays an important role in enhancing the perception and the reputation of the cluster, and that this in turn makes it easier for the companies within the cluster to internationalize. The importance of cluster reputation has already been discussed, and I find this to be another confirmation of that finding.

The inward internationalization also plays an important role in connecting NODE to clusters and companies in different locations around the world. NOV is as an example located in Houston, the home of the world's leading oil and gas cluster, and they also have a subsidiary in Brazil. The result of this is that NODE and the clustering firms gain access to a global knowledge network, and to a global network of potential customers or partners (Oliver et al., 2008). This theory is confirmed by the representatives from both Bestra and Hernis, who points out how the presence of these companies have played an important role in connecting the companies in the cluster to potential customers around the world. These findings are in line with the revisited Uppsala model, where being an "insider" in networks has become crucial for companies looking for internationalization. The foreign companies help the cluster to get access to networks, and this increases the potential for the companies to internationalize and succeed.

#### **6.3.5 Other cluster externalities**

Finally, theory states that there is also some other cluster externalities that have a positive impact on the internationalization of SMEs. According to Porter (2000), one of these other externalities is how location within a cluster can provide the firm or a group of firms with the possibility to take advantage of several marketing complementarities such as joint trade-show participation, firm referrals and joint marketing delegations.

The representative from OOS states that as of today, they have not taken part of any official internationalization projects within NODE. However, they have been part of the NODE stand at

Stavanger Oil and Gas and had a positive experience from this. They claim that if they were to participate in an Expo in Brazil, they would definitely try to become part of a NODE stand. They state: *«it makes us more visible, gives us more publicity and gives us the opportunity to meet more people than would be possible if we were alone»*. The representative from Nymo has also been part of the NODE stand at Stavanger Oil and Gas, but when they went to Rio Oil and Gas they went alone. They argue that the big companies in the cluster will have their own stand and for them it will not be beneficial to be part of a shared NODE stand. This is not just because of their size, but also because they are fierce competitors, approaching the same potential customers. The representative from Nymo further argue that to them, the most important aspect is that the big companies succeed in their internationalization process, and then their job is to succeed with their approach to these companies.

Further on the representative from Noba Tech stresses the importance of the Brazil 1 project. The project, described in section 2.4.1 is a collaboration project between the NODE companies, facilitated by the NODE organization. The representative from Noba Tech points out that without this project, the three NODE companies; Andersen Mekaniske Verksted, Bestra and Kongsberg Devotek, would never have established themselves in Brazil. This project is also of great importance for Aker and NOV, since the result may be that they can use a NODE company as one of their suppliers in Brazil. The representative from Aker points out how this project would never been initiated without the existence of the NODE organization. The organization did much of the prep-work, and the result is that three NODE companies have started working together and started a company that is in the final process of establishing themselves in Brazil. The project also resulted in three NODE companies forming a joint marketing and sales network where they work together to negotiate with companies in Brazil that can represent them.

These findings confirm Porter's theory that participation in a cluster generates several externalities that has the potential to have a positive impact on the internationalization process of the clustering firms. I also find that there are some differences between the experiences of the SMEs and the large corporations. This is natural, since the large corporations are competing on a

different level than the SMEs, and the large corporations in the cluster are fierce competitors. That being said, when both Aker and NOV saw that they needed to get more of the NODE companies to establish themselves in Brazil, they teamed up with the NODE organization and initiated the Brazil 1 project that resulted in the establishment of Noba Tech. This shows that even if these companies are strong competitors, they can still cooperate when needed.

## **6.4 Internationalization to Brazil**

The companies in this study are on different levels in terms of how far they have come in their internationalization process and they have used different strategies to get there. The focus of this thesis is the internationalization process towards Brazil, and in this section I will analyze how being part of NODE may have helped to facilitate and ease this process.

### **6.4.1 Challenges in Brazil and barriers to entry**

The representatives from the interviewed companies highlighted the same challenges as those listed in section 3.5.4. Corruption, bureaucracy, local content regulations, cultural differences, tax issues, and the price and capacity of skilled labor are all issues that are raised during the interviews.

#### **6.4.1.1 Corruption**

Corruption is highlighted by almost all of the companies as one of the major challenges of doing business in Brazil. The representative from Noba Tech states that “*corruption exists and there is no point of saying something else*”. The representative from OOS follows up on this and points out that even if they have not experienced the corruption directly yet, they know that it is there and that it is something that you will have to keep in the back of your head when you want to do business in Brazil. The representative from Aker highlights much of the same. They face issues related to corruption every day and the representative points out that it is a major challenge for the whole Brazilian economy.

#### **6.4.1.2 Bureaucracy and legal system**

The representative from NOV highlights the bureaucracy and the legal system as two major challenges. The different regions operate with different legal systems and if you operate in several regions, it is extremely hard to get a complete overview of all the rules that exist. Further on, the rules changes all the time, so you need to have a continuous process to be able to follow

all the changes. The representative from OOS points to the same the fact, that the regions have different and changing set of rules and this makes it hard to use the experiences from one region and apply them in the next.

#### **6.4.1.3 Tax system**

The complicated tax-system is another challenge that makes it difficult to succeed with the internationalization process towards Brazil. As with the legal system, the tax system varies from region to region. The representative from OOS points out how the consultants they have used in Brazil claim that one of the most import aspects of doing business in Brazil is to plan your taxes the right way. This is obviously a huge challenge for all companies, but especially for SMEs with a limited amount of resources available to use on acquiring this knowledge. The representative from Aker highlights much of the same, and states that this can be especially challenging for the SMEs whom do not possess the experience and the resources needed to get a complete overview of the system.

#### **6.4.1.4 Local content**

To the majority of the companies from NODE operating in Brazil, the strict local content requirements are extremely challenging. The representative from Aker points out that the local content requirement is a huge challenge by itself, and that to make it even more challenging, the regulations and the requirements change all the time. It increases the risk, and the way you deal with this risk is decisive for the chance of succeeding with the internationalization process towards Brazil. The representative from Nymo points out that until now, the majority of the contracts they have signed have been without requirements of local content. Still, they acknowledge the fact that the requirements can be a huge challenge, and that it is a complicated and difficult process to deal with. The representative from Hernis also emphasize how complicated the system with local content requirements is, and that the regulations creates a lot of difficulties for the company.

#### **6.4.1.5 Cultural differences**

The final challenge that is highlighted as a barrier to succeed for the NODE companies that wants to internationalize to Brazil is the cultural differences that exists between Norway and Brazil. Representatives from Hernis, OOS, Aker and Noba Tech highlights “understanding the culture” as

one of the most important factors if you are to succeed in Brazil. The differences have been explained in 3.5.4.4 and these differences are part of what Johanson & Vahlne described as the “psychic distance” that creates obstacles for companies through preventing the flow of information from and to the market (Johanson & Vahlne, 1977). Brazil would according to this theory not be among the first countries for a Norwegian company to approach. However, the theory was as I showed earlier on in the thesis, revisited and it was found that companies could get access to the tacit knowledge that they needed to overcome this “psychic distance” through insidership in networks (Johanson & Vahlne, 2009).

#### **6.4.2 How being part of NODE can act as facilitator for the internationalization process towards Brazil**

The companies I have interviewed for this thesis have used NODE in different ways in their internationalization process towards Brazil. Some of them have not come longer in their internationalization process than that they can predict some of the ways being part of NODE might help, while others have already taken advantage of several of the cluster externalities discussed in this thesis.

The representative from Hernis explains that when they started working towards establishing themselves in Brazil, the cluster did not have the position it has today, and there was no focus on working together with a large group of firms in the region in order to succeed on the international market. The representative states *“If Hernis was to start the process of establishing the company in Brazil today, we would, without any doubt, be able to do this way much cheaper than we did. The Brazil project initiated by the NODE organization is a really good initiative that we would have participated in if we had not come so far in the internationalization process already”*.

The representative from Noba Tech tells that in the process of establishing themselves in Brazil, they have used both the reputation of the cluster and the fact that the companies that have formed Noba Tech have delivered their products to Aker and NOV. The representative states that *«in the future, Noba Tech will be using the fact that they are a part of NODE inn all meetings when*

*they know that the other party has some knowledge of the cluster. NODE has a good reputation, and companies that are part of NODE have an opportunity to take advantage of this”.*

Brazil is a difficult market, and to identify the right people to meet and the right people to do business with can be challenging. The representative from Noba Tech explains that being part of NODE helps to open doors, to give them access to meetings and also leads to Noba Tech receiving enquires from potential partners, customers and so on. This finding is in line with Johanson and Vahlne’s revisited Uppsala theory (Johanson & Vahlne, 2009), and also one more confirmation of Porter’s theory on how globalization have increased the importance of location (M. E. Porter, 2000). The right location in Southern Norway helps companies from the cluster get access to potential partners and customers in Brazil. It can also be seen as one more confirmation of how cluster reputation can help to facilitate the internationalization of an SME (Zyglidopoulos et al., 2006).

#### **6.4.3 Can it become a source of competitive advantage?**

The challenges related to doing business in Brazil are challenges that not only concerns NODE companies looking to establish themselves in Brazil. Almost all companies face these challenges. To deal with them can be extremely demanding, both in time and money. I have already showed many of the ways being a part of a strong cluster like NODE can help SMEs in the internationalization process. The next step is to analyze how coming from the NODE cluster can be a source of competitive advantage for the companies in the cluster that wants to do business in Brazil.

According to the representative from Bestra, one of the owners of Noba Tech, the strict local content regulations is the main reason for why they see a business potential for Noba Tech in Brazil. He claims that the companies that are able to obtain the knowledge needed regarding how to deal with these regulations are likely to have a competitive advantage towards their competitors. He believes that this can be a source of competitive advantage for several of the NODE companies that are looking to establishing themselves in Brazil. The representative from Noba Tech highlights much of the same as the representative from Bestra did; *“if a company is*

*able to adapt to the local content regulations and learn how to work with the local suppliers and adapt to their way of working, it can turn into a huge competitive advantage".* By working together towards adapting to the challenges you face in Brazil, the representative believes that this can turn into a source of competitive advantage for the whole cluster, and thus it can help to ease the process of internationalizing to Brazil.

The representative from Aker believes that if the NODE companies are able to establish themselves in Brazil and deliver their products to them, in the Brazilian market, they should also be strong candidates for delivering the products to other companies, such as Brazilian, American and other big oil and gas companies. These companies have the same problem with fulfilling the requirements related to the share of local content. If some of the NODE companies are able to deliver high quality products that fulfill the local content requirements, they have the potential to expand their customer base and take a position in the Brazilian oil and gas industry.

The representative from Aker highlights how the NODE organization have contributed to the internationalization process towards Brazil by spending a lot of time establishing connections with important Norwegian governmental institutions. These connections can influence Brazilian government, and help the NODE companies to get access to the Brazilian market and to easier overcome some of the challenges related to doing business in Brazil. NODE thus helps to facilitate the internationalization towards Brazil by helping the NODE companies getting their voices heard with the right people and institutions in Norway, and that this again can help to influence the right people and institutions in Brazil. The representative from OOS points out much of the same and claims that one of most important ways the NODE organization can facilitate the internationalization of the SMEs in the cluster, is by establishing connections, both in the public and in the private sector. He further states *"I believe that we can take advantage of NODE when we now are establishing ourselves in Brazil. The reputation of the cluster, the political connections, and the sharing of knowledge are all important factors that can help the companies succeed, however, it must be emphasized that nothing will happen if the companies themselves are willing to work hard."*



The representative from Noba Tech further points out how the cooperation between the NODE organization and the cluster in Brazil can be extremely beneficial for NODE companies that wants to do business in Brazil. The cluster organization in Brazil has strong political support, and by cooperating with this cluster, the NODE companies have a potential to develop a competitive advantage towards their competitors without the same connections. The cluster organization is working together with the NODE organization and companies within the cluster are looking for partners from NODE. That way, insidership in networks is once again showed to be extremely important, and to be located at the right place seems to give the companies in NODE this insidership. The representative from Hernis points out that if a group of the companies in the cluster are able to overcome the barriers that exists, and succeed with establishing themselves in the Brazilian oil and gas industry, this could turn in to a competitive advantage that makes the NODE companies better equipped for success in Brazil compared to companies not located within the cluster.

It seems to be clear that being a NODE company can be a source of competitive advantage for the NODE companies, and especially for companies that wants to establish themselves in a market with a great “psychic distance”, like Brazil. To succeed in a market where there are so many challenges is difficult, and the access to tacit knowledge about these challenges is of great importance. Being a part of a cluster, like NODE, helps ease the access to this tacit knowledge, and this increases the chance of the NODE companies succeeding in Brazil. By sharing knowledge on the complicated tax system, on the challenges related to the cultural differences, market opportunities, and other important information, the companies in NODE can develop a competitive advantage compared to companies that are not part of a similar industrial cluster. Further on, if the NODE companies are able to learn how to overcome these challenges at an early stage, it can become an even greater source of competitive advantage. The local content regulations in Brazil have led to an imperfect market where the regulations have acted as a barrier to entry for foreign companies. The local companies do not possess the ownership advantages that the NODE companies have, and this means that there are some locational

advantages that can be internalized by the companies, and if they succeed with this, it can be a great source of competitive advantage.

## **7 Main findings, conclusion, limitations and further research**

### **7.1 Main findings**

#### **7.1.1 Findings - NODE**

First of all, I find that NODE is a world-leading cluster and further on that the success of the cluster probably can be contributed to many factors. I find that the diamond model seems to have been configured in an ideal way for NODE. Not only is the cluster scoring high on the four diamond dimensions, which has given them a competitive advantage compared to others that are not part of the cluster, but the cluster is also scoring high on the residual influences; the role of government and chance or “luck”.

#### **7.1.2 Findings - Knowledge**

I find that there is a positive attitude towards knowledge sharing within the cluster and that it takes place in various ways. Further on, I find that it is the informal exchange of knowledge that has played the most important role for the companies’ internationalization process so far. I find that large companies and the SMEs have a different view on the degree of knowledge sharing, and that the SMEs experience more knowledge sharing than the large companies. Both the SMEs and the large companies are however willing to share their knowledge, but I find that the representatives from the large companies have not experienced any requests to share market knowledge with the SMEs. I also find that the way the representatives highlights the importance of informal meeting arenas and informal knowledge sharing, can be seen as a confirmation of Johanson and Vahlne’s theory of networks and the importance of “insidership”, and Porters’ theory on the importance of location.

#### **7.1.3 Findings - Social capital**

I find confirmations of Laursen et al.’s (2012) theory that there is a positive relationship between potential social capital in a region, and the firms’ involvement in foreign markets. I find that the social ties that exist in the region play an important role in facilitating the internationalization efforts of several of the SMEs. These findings are also in line with Johanson and Vahlnes’ theory

where they show that “insidership” in networks has become the most important source of tacit knowledge for a firm, and how this insidership can compensate for lack of international experience (Johanson & Vahlne, 2009). Further on, I find that that the social capital that exists within the cluster is not only acting as a facilitator for sharing and development of knowledge, it also acts as a facilitator for ethical and cooperative behavior. By looking at this in the light of Porters’ theory of the increasing importance of geographic proximity, I see these findings as one more confirmation of his theory. I also find that tacit knowledge and close personal relationships have, at least for the NODE companies, become an important factor for their competitive success. I find that the spatial proximity makes it easier to get access to, and share tacit knowledge, and that this information and knowledge exchange can help the companies to get information they need in their internationalization process.

#### **7.1.4 Findings - Cluster reputation**

I find that there are some mixed perceptions on whether cluster reputation can serve as a substitute for corporate reputation. It do not seem like it can fully replace a strong corporate reputation, but for a firm without the resources to develop this strong corporate reputation, I find that it should definitely be possible to take advantage of the cluster reputation. I also find that Peterafs’ (1993) theory that cluster reputation is more beneficial for SMEs than for the larger companies in the cluster seems to be true. Further on, I find that being part of a well reputed oil and gas cluster does not facilitate the possibility for the companies to charge premium prices, and that Zyglidopoulos et al.’s theory on this matter does not seem to hold, at least not for this industry. I do however find confirmation on other parts of their theory, where especially the theory that cluster reputation can facilitate the internationalization process of a SME by reducing the legitimating costs seems to hold up. The need to advertise, promote the company, and establishing their own reputation is reduced as a direct consequence of NODEs reputation. Finally, it is also important to highlight the importance of a strong reference list, and how deliveries to the two locomotives in the cluster can give the SMEs a competitive advantage compared to firms without this list to show to. The reputation of the companies within the cluster thus also plays an important role.

### **7.1.5 Findings - Inward internationalization**

I find that inward internationalization seems to play an important role for the success of the cluster and for the clustering firms' internationalization process. This finding confirms Birkinshaw's (2000) theory that inward internationalization plays an important role in enhancing the perception and the reputation of the cluster, and that this in turn makes it easier for the companies within the cluster to internationalize seems to be right. I also find that inward internationalization plays an important role in giving NODE and the clustering firm's access to a global knowledge network, and to a global network of potential customers or partners. These findings are in line with the revisited Uppsala model, where being an "insider" in networks has become crucial for companies wanting to succeed on the international market.

### **7.2 Conclusion**

The findings of this thesis may have implications, or at least be applicable for the literature discussed in the literature review section of this thesis. It can have an impact on the internationalization theory that was discussed, were the findings seem to confirm the "new" Uppsala model where insidership in networks is shown to play an increasingly important role for the success of the internationalization of companies. It also has an impact on the knowledge literature discussed, and especially Morosini's (2004) theory on the importance of tacit knowledge and close personal relationships. Finally, the findings also add to the cluster literature discussed, and more specifically to the role that cluster externalities can have on the internationalization process of the clustering firms and especially the SMEs. The findings confirm Porter's theory that participation in a cluster generates several externalities that has the potential to have a positive impact on the internationalization process of the clustering firms.

It seems to be clear that coming from the NODE cluster can be a source of competitive advantage for the NODE companies, and especially for companies that wants to establish themselves in a market with a great "psychic distance", like Brazil. To succeed in a market where there are so many challenges is difficult, and the access to tacit knowledge about these challenges is of great importance. Being a part of a cluster like NODE helps ease the access to this tacit knowledge, and this increases the chance of the NODE companies succeeding on the global market. As shown in

this case example with Brazil, by sharing knowledge regarding the complicated tax system, on the challenges related to the cultural differences, market opportunities, and other important information, the companies in NODE can develop a competitive advantage compared to companies that are not part of a similar industrial cluster. Further on, if the NODE companies are able to learn how to overcome these challenges at an early stage, it can become an even greater source of competitive advantage. The local content regulations in Brazil have led to an imperfect market where the regulations have acted as a barrier to entry for foreign companies. The local companies do not possess the ownership advantages that the NODE companies have, and this means that there are some locational advantages that can be internalized by the companies, and if they succeed with this, it can be a great source of competitive advantage.

The findings of the thesis indicate that being part of a strong and well-known cluster has a positive impact on the internationalization of the clustering firms. It seems clear that the answer to the research question is that first of all, a strong industrial cluster can definitely act as a facilitator for SMEs that wants to internationalize.

Secondly, a strong industrial cluster can act as a facilitator in many ways. The most important way seems to through the sharing of tacit knowledge. This finding fits well with Johanson & Vahlne's (2009) theory that insidership in networks is crucial to gain access to the tacit knowledge needed to succeed in the internationalization process. I find that the social capital that exist in the region plays an important role for the success of the cluster, and that this plays an important role for the sharing of tacit knowledge and for the development of close personal relationships within the cluster. I also find that that the social capital that exists within the cluster is not only acting as a facilitator for sharing and development of knowledge, it also acts as a facilitator for ethical and cooperative behavior.

Further on, I find that the way the cluster reputation can replace the need of a strong company reputation also plays an important role in facilitating the internationalization process of the firms in the cluster. This finding confirms in many ways Zyglidopoulos et al (2006) theory that cluster

reputation can facilitate the internationalization process of a SME by reducing the legitimating costs. The need to advertise, promote the company, and establishing their own reputation is reduced as a direct consequence of NODEs reputation.

Finally, the inward internationalization to the cluster also plays an important role for the international success of the SMEs in the cluster. This attractiveness to foreign investors makes the cluster stronger which again makes it easier for the firms within the cluster to internationalize.

These findings confirm Porter's theory that participation in a cluster generates several externalities that has the potential to have a positive impact on the internationalization process of the clustering firms. I also find that there are some differences between the experiences of the SMEs and the large corporations. This is natural, since the large corporations are competing on a different level than the SMEs, and the large corporations in the cluster are fierce competitors. That being said, when both Aker and NOV saw that they needed to get more of the NODE companies to establish themselves in Brazil, they teamed up with the NODE organization and initiated the Brazil 1 project that resulted in the establishment of Noba Tech. This shows that even if these companies are strong competitors, they can still cooperate when needed.

I find that it is not just one single factor that contributes to the way a cluster can act as a facilitator for SMEs looking to internationalize. I find it important to recognize the way these externalities affect each other. For a long time, it was believed that globalization would reduce the relevance of the local context for the strategic decisions of firms. This study is one more confirmation of the research that has showed that it is the exact opposite that is true. Globalization increases rather than decreases the relevance of local context for firm's strategic decisions. I find that what it all boils down to is the importance of being an "insider" in a strong network and that location in a specific place, like the Agder region for an oil and gas supplier, helps you to get access to the important tacit knowledge that is needed to succeed in today's

global market. Porter's (2000) location paradox, that "the most enduring competitive advantages in a global economy seem to be local" is thus confirmed.

### **7.3 Limitations of the thesis**

It can be argued that the research conducted throughout the thesis holds some limitations. In section 5.6 I have described the methodological limitations of the thesis and I will not go through them again in this section. I will however shortly highlight some of the limitations related to the analysis of case studies, and further on I will go more in depth on some general limitations of this thesis.

This case study relies only on a few selected companies within the cluster. Further on, the respondents were picked based upon a non-random sample and there were only a limited number of potential respondents within the cluster. A larger, more random sample would have increased the generalizability of the thesis and would have made it easier to draw a valid conclusion.

In this particular case, it was sometimes hard to point to a direct cause and effect relationship between the externalities of the cluster and the success and the internationalization of the companies. External factors such as the extreme rise in the price of oil over the last 15 years have definitely also been an important factor for the success. Still, based on the analysis, it is hard to argue against the fact that cluster externalities have played an important role in the success of the companies in the NODE cluster.

Another limitation when writing this thesis was the lack of prior research studies on the topic. I have used several different studies that have helped to lay the foundation for my understanding of the research problem, but I was not able to identify more than one research paper focusing on the exact topic of this thesis.

Finally, the fact that many of the companies that were interviewed still are in the early stages of their internationalization process towards Brazil meant that there were some questions that were hard to get a thorough answer to.

The result of these limitations is that the external validity of the study is relatively low and that it is hard to generalize the findings. That being said, it was never the intention of the study to present findings that are applicable in other locations or in other industries. However, I do believe that some of the methods I have used, the literature I have presented, and some of the findings from the analysis can be used and adapted in research of other locations or other industries. In the next and final section, I will address how these limitations can be seen as opportunities for further research.

#### **7.4 Further research**

The lack of prior research studies means that there is an opportunity for further research regarding the topic. Also, the findings and the limitations of the thesis suggest that there are several research avenues and opportunities for further research that can contribute to a deeper understanding of the topic presented in this thesis.

First of all, the fact that so many of the firms involved in the research are so early in their internationalization process towards Brazil means that there is an opportunity for a follow up study. A follow up study of the same SMEs when they are more established would enable the researchers to see if their thoughts and predictions of how the cluster could facilitate their internationalization process towards Brazil turned out to be true.

I have in previous sections argued how my study could have been improved through a larger sample size. A potential further research can be to increase the sample size of companies interviewed within the NODE cluster and see if the findings in this thesis are applicable for these firms as well. Further on, a comparative study where the researcher looks at other clusters and sees if the same effects are found there would improve the validity of the findings even more.



Another interesting point for further research could be to do a comparative study that includes SMEs within a cluster and SMEs outside a cluster, and see how the internationalization process differs between these firms. This would provide the researchers with interesting insight that could be used for comparison.

The focus of this study was a group of selected cluster effects related to the internationalization process of an SME. An interesting approach for further research could be to examine how other cluster effects such as increased innovation, regulatory reforms, and advanced and specialized factor development can impact the success of an SME. The result could be a more explanatory and comprehensive analysis.

Finally, a more quantitative study that includes a larger sample of companies, both within and outside a cluster, would enable the researcher to draw more valid conclusions regarding the findings, and it could be possible to generalize the findings for a larger population.

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