

Handelshøgskolen

## **The Competitive Advantage of Nations:**

*Has the Icelandic whitefish fillet industry created and sustained superior performance over the Norwegian industry?*

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# Foreword

First of all I would like to thank Handelshøgskolen i Tromsø for giving me the opportunity to step into a world that I did not in my wildest imagination know that existed by accepting my study application in the summer of 2009. It was not easy to leave my family and move abroad for the second time in my life and this time it sure was not easy to leave a certain person behind.

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## Summary

The whitefish fillet industry in Iceland and Norway have both produced and exported relatively similar products to the global markets for decades. When the Icelandic whitefish fillet industry is considered being strong and profitable, the comparable Norwegian whitefish fillet industry is described as a coherent crisis because of red numbers and numerous bankruptcies. According to strategy literature, the Icelandic whitefish fillet industry may have a sustained competitive advantage over the Norwegian industry.

With this backdrop, I have in my thesis attempted to find out 1) if the Icelandic whitefish fillet industry actually is more profitable than the Norwegian industry, 2) if the profit differences are caused by sustained competitive advantages, and 3) if the advantages are duplicable. With datasets for 10 consecutive years (2003 – 2012) including firms accounting data, landing data and exporting data from external sources, I developed working hypotheses to explore my research questions.

The results uncovered that the Icelandic whitefish fillet industry was more profitable than the Norwegian, and that this may be due to sustained competitive advantages. The Icelandic firms are pursuing more differentiated marketing strategies by processing and exporting relative more of fresh whitefish fillets than the Norwegian firms. The differentiation strategies are matched by procurement strategies focusing on landing fresh raw material of high quality caught by hooking gears. In contrast, the Norwegian firms are catching relative more raw whitefish by netting gears at lower cost, and exporting it unprocessed fresh or frozen at lower prices.

The financial comparison of the industries disclosed that the more complex the structure of the Icelandic firms is, the more profitable they were. However, when comparing the profitability of identical strategic groups, the profitability differences were less pronounced and only significant on operational level. This may imply that the improved profitability of the Icelandic industry was mainly due to healthier profitability of the strategic groups that were not present in the Norwegian population. The institutional framework in Iceland is less rigid than in Norway, which allows the firms to develop a

structure which supports a more market-oriented approach. For the Norwegian firms to develop in the same direction, it will require managerial, administrative, and political grips that is not easy to implement.

Keywords: Profitability, whitefish fillet industry, competitive advantage.

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# 1 Introduction

## 1.1 Theoretical backdrop

In business science, the field of strategic management has put forward many theories that attempt to explain why some firms in a particular industry are more profitable than other firms in the same industry over time. What characterizes many of those theories is that they assert that firms which on average achieve high or superior returns have some sort of advantage over its competitors. According to Porter (1979; 1980; 2008), each firm's strategy is shaped by external forces which every firm in that particular industry faces. Moreover, the firms which are more capable of minimizing threats as well as exploiting the opportunities that can emerge from the external environment, will attain competitive advantage over its competitors that are less capable to do so.

Barney (1991) on the other hand, claims that internal resources can explain the differences between firms that operate in the same industry but with varied results. Barney argues that firms that achieve superior returns repeatedly dispose a resource portfolio, which is heterogeneous and immobile between firms. And if such portfolio cannot be matched or surpassed by competing firms, firms holding such valuable, rare, inimitable, and un-substitutable resource portfolio are said to have a "sustained competitive advantage" over its competitors.

Firms can also gain a competitive advantage by implementing long-term strategies on becoming more environmental friendly (Hart, 1995), or by cooperating with other firms in different industries (Lavie, 2006). Moreover, they may have different type of knowledge within the firm that is considered more valuable than knowledge within competing firms (Grant, 1996), or they may be more capable to adapt to dynamic changes from the environment (Teece et al., 1997). All these theories are almost without an exception based on firm level.

However, when comparing industries on national level, the approaches need to be adapted to national differences. For industries based on natural resources, obviously the resources in terms of accessibility, quality and volume may differ. In addition, the competitive climate

may differ due to for example legislative dissimilarities and how intermediate markets are organized. Moreover, cost of input factors like labor and capital may differ between nations.

## **1.2 Empirical setting**

The Nordic countries of Iceland and Norway have in common that they control very valuable fishing grounds. Both countries harvest the same type of natural resource, which is processed and primarily sold to the same global markets with the most valuable species being cod, haddock and saithe. Geographically Iceland is an island in the North Atlantic Ocean, while Norway is a part of Continental Europe with borders to Sweden, Finland and Russia. Iceland has therefore the ability to pursue fishing around their country when Norway has only the ability to pursue fishing from the west coast, northwest coast and the north coast of their country.

### *Structural changes*

Firms within the whitefish fillet industry in Norway and Iceland have both been through substantial structural changes over the past decades. In Norway, the whitefish fillet industry is seen as a coherent crisis which is characterized by weak profitability and closed down plants, going from around 100 in the 1970's to a total of 10 in 2010 (Finstad et al., 2012). In Iceland, however, the whole fish industry has been relatively profitable since the early 1990's (Knútsson et al., 2011). This is mainly due to deregulations and other legislative changes. This has resulted in a more consolidated fishing industry since many firms in the whitefish fillet industry have acquired or merged with other firms in the industry, mainly through using the Icelandic stock exchange as their funding source (Einarsson, 2003; Knútsson et al., 2008; Pétursson, 2013).

### *Input uncertainty*

One pivotal challenge, which creates a lot of external uncertainty in the whitefish fillet industry, relates to biology or the state of nature (Ottesen & Grønhaug, 2003). The migratory pattern, and therefore the accessibility of whitefish species (especially cod), has resulted in a seasonal based fishing in Norway due to economic reasons (Nilssen et al., 2014) which in turn has led many fish processing firms not to be able to utilize their capacity completely. Firms that are more flexible to handle input uncertainty are more likely to survive and keep their operation going (Dreyer & Grønhaug, 2004). The competitive terms for the processing firms

have also changed over the past decade due to technological innovations, and better logistical solutions, which has resulted in an increased competition for the raw material of caught fish (Dreyer, 2000; Egeness, 2013).

### *Global competition*

The main competition is for unprocessed material, mainly frozen whole fish, which are now bought in large scale by international firms that are operating in countries with much lower labor costs than in Norway, mainly the Baltic states and China. What once used to be a local market has now become a global market for caught fish (Bendiksen & Dreyer, 2003). In low cost land like China, the fish is processed and sold in the market as double frozen fillets at a considerable lower price than can be gained for fresh and single frozen fillets (Egeness, 2013).

### *Previous studies*

The competitiveness regarding the fish industry between Iceland and Norway has mostly been studied at a superior level. In a report by the FCI TEAM (2005), they concluded that the total competitiveness was slightly better in Iceland than in Norway. On a macroeconomic level, the fisheries management was considered being better in Iceland, while macroeconomic management, infrastructure and environment was considered being better in Norway. On a microeconomic level, the fishing companies, the fish processing companies and marketing were all considered being better in Iceland, since firms in Iceland were more closely integrated with their environment.

Another study of fish industries indicates that Iceland may have an advantage over Norway. When comparing the productivity in the fish industries of Iceland, Norway and Sweden in the period 1973-2003, Eggert and Tveterås (2013) found that the productivity in the fish industry in Iceland was substantially higher than in the Norwegian fish industry over the aforementioned period. They did, however, not find any proof that the productivity between the nations converged even though best-practice fishing technology was available in the international market place.

### **1.3 Research questions**

Based on the facts presented above indicating that Norwegian firms who are processing whitefish products may perform poorly compared to Icelandic firms, I will raise the following research questions:

*“Does the Icelandic whitefish fillet industry have competitive advantages over the Norwegian whitefish fillet industry, which makes the Icelandic industry more profitable than the Norwegian industry? If so, what are those advantages and are they duplicable?”*

First, I will examine whether the Norwegian and the Icelandic firms that base their production on the same type of natural resource, namely whitefish (cod, haddock and saithe), have different profitability, since they both compete and sell most of their products to the same markets. If there are performance differences, the next step will be to find the reasons for the differences, and consider if they have roots in various competitive advantages. Finally, I will consider if those advantages are duplicable.

### **1.4 Methodological issues**

Several methodological challenges arise in a study like this. One problem is that the industry may consist of many strategic groups with very different characteristics. To be able to say something about the differences in profitability, and if those differences are caused by sustained competitive advantages, the activities that are compared must be as equal as possible. In other words, “apples” should be compared to “apples”, and not to “oranges”. In my research design, I have attempted to make sure that the activities compared are as equal as possible.

Another methodological challenge is the timeframe issue. The firms and the strategic groups should be facing different challenges during a period of time. Often the validity of the results is limited to the period studied. In order to strengthen the validity the firms and the strategic groups should be studied for several years where the competitive environment gives the industry studied a set of challenges that they normally have to deal with.

A third methodological issue is the measurement of performance. Such measures are based on information from public financial statements that are produced within different sets of national laws and expectations. In this study, I have created several performance measures grounded on different accounting information. The intention of this is to be able to see where in the financial statements possible advantages may be lodged.

*The structure of the thesis*

The thesis will continue with a literature review that address why an industry in one country can be more profitable than the same industry in another country. After that, the thesis proceeds with a chapter that accounts for the methodology chosen. Here will the research design and the empirical setting be presented. The next chapters will focus on the results and a discussion. Finally, the implications of my findings will be discussed.



## **2 Literature review**

In general, all firms that sell their products in global markets, must base their strategies on resources and capabilities that give them sustainable competitive advantages. Moreover, even though organizational-specific advantages are important, a competitive advantage in a global context will depend on country-specific and/or geographical advantages. The theoretical approach chosen to address the research problem studied in this thesis is an integration of the theory of Porter's diamond, better known as "The competitive advantage of nations" (Porter, 1990) and "the comparative advantage theory of competition" (Hunt & Morgan, 1995).

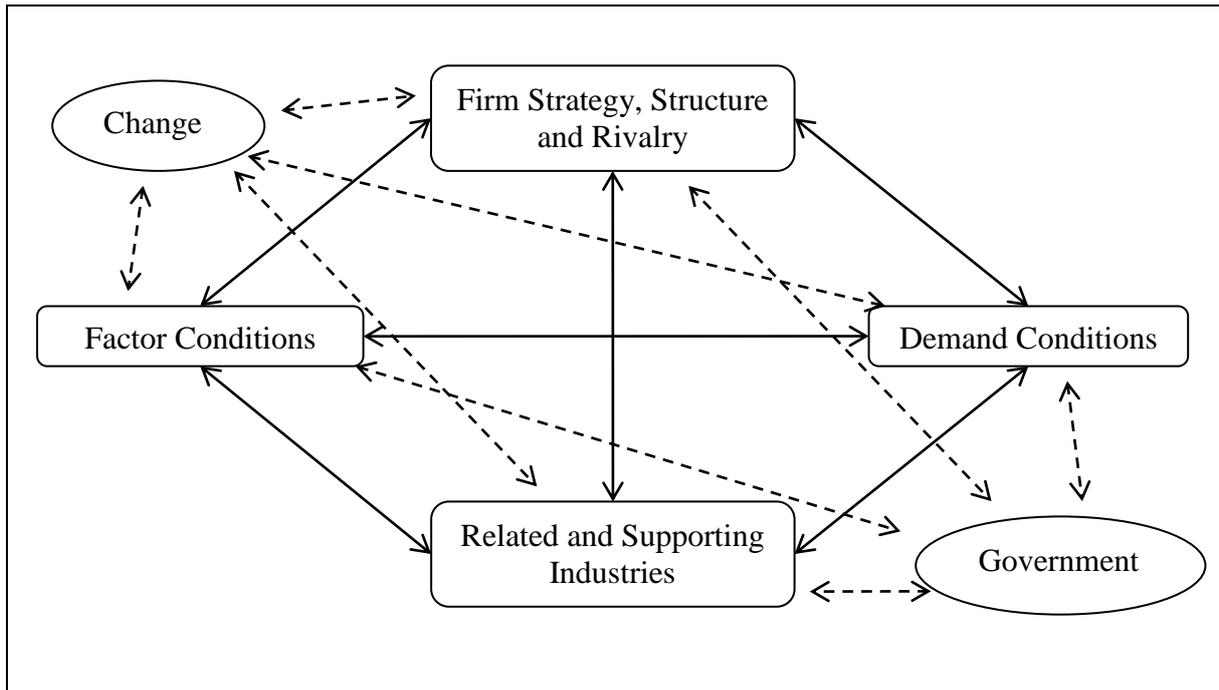
### **2.1 Porters Diamond**

The foundation of Porter's Diamond is to explain why some countries are more successful in certain industries than other countries (Smit, 2010). According to Porter (1990), the recipe to gain competitive advantage in any industry on a national level is through innovations and to constantly seek ways to keep those industries upgraded with the best production sets available compared to competing nations. If the innovation processes begin to halt for an industry, which is located in a nation that is considered having competitive advantage, then competing industries located elsewhere will take advantage of it. To gain competitive advantage on such broad level as national level can take significant amount of time and even decades to gain (ibid.) implicating that competitive advantage is not created over night.

The successfulness of innovations, which is considered the fundament for competitive advantage on a national level, lies according to Porter (1990) in four broad attributes:

- Factor condition (endowment)
- Firm strategy, structure and rivalry
- Demand condition
- Related and supporting industries

The name Porter's diamond comes from the way these attributes are constructed together as can be seen in Fig. 1 (next page), and can individually and as a system explain how national advantages can be created.



**Fig. 1.** Porters Diamond. Source: Joshi & Dixit (2011).

In addition to these four broad attributes, there also exist two external attributes, which indirectly can have positive or negative impact on the creation of national advantages:

- The role of government
- Exogenous changes

I will now discuss the characteristics of each attribute.

***Factor conditions***

The attribute of factor condition are so called factors of production or relatively speaking all sets of resources necessary to produce the goods that are demanded worldwide. These resources can be divided into following categories:

- Human resources
- Physical resources
- Knowledge resources
- Capital resources
- Infrastructure resources.

Factor condition can further be divided into basic factors and advanced factors where the advanced factors can further be divided into general factors and specialized factors (Smit, 2010).

Basic factors are factors that do not require much investment to be utilized like location, unskilled labor, natural resources and existing infrastructure. Advanced factors are factors that require much investment to be created and are upgraded through reinvestments and innovation to specialized factors (Smit, 2010), like skilled labor, research, and new technology.

The difference between general factors and specialized factors is that general factors are factors that can be applied through different industries, and are therefore easier to obtain since they can be acquired from the market without much difficulties (Porter, 1991). Specialized factors on the other hand are factors which are regarded as the most important factors in any industry since they are specially developed with particular industry's needs in mind (ibid.), and are therefore not easily obtained (Smit, 2010).

Firms should therefore focus on upgrading and innovations in order to create their own specialized factors, since that is the main source of a competitive advantage. Nevertheless, to be able to create a competitive advantage, an interaction between the basic and advanced factors must occur. Advanced factors are usually more expensive to apply compared to basic factors that with their disadvantages can trigger innovations more easily (Porter, 1991).

Advantages related to factor condition on a national level can therefore be a source of sustained competitive advantages for national firms in global markets. Access to cheap energy-to-energy-intensive industries in Norway and Iceland is a source of competitive advantage. Same principle holds for the accessibility of abundant marine resources maintained under national control.

### ***Firm strategy, structure and rivalry***

The attribute of firm strategy, structure and rivalry refers to the competitive arena for a specific industry in each nation. A firm that is a dominant player in its home market might be saturated by its success and with that lose its competitive advantage abroad. Big rivalry on the other hand ensures that firms do everything that they can to improve their business

(Porter, 1991). Mostly by becoming more innovative, produce at lower costs or produce more improved goods (Porter, 1990). Such improvements could lead to reduced profits in the domestic market but may lead to increased profits in foreign markets (Porter, 1991).

### ***Demand conditions***

The attribute of demand condition refers to domestic demand, not because of its size but of its nature (Porter, 1990; 1991). Every firm reacts to buyers needs by creating new products or by improving their existing products, which they then supply to the market that matches buyers demand, quality expectations and features (Smit, 2010). The transferability of domestic demand to global markets will therefore depend on buyers demand and expectations to the products in the home market (Joshi & Dixit, 2011). Those firms, that are more able to handle sophisticated and demanding home customers in the domestic market can therefore, create a competitive advantage on national level (Porter, 1990).

### ***Related and supporting industries***

The attribute of related and supporting industries refers to industries that either produce similar goods or supply the industry with the inputs needed to produce demanded goods like banks, transportation firms and engineering firms. Both related and supporting industries can create competitive advantages for each other by providing market information and/or grant access as well as information about new technology (Porter, 1991). In most industries, there exists a lot of technological and tacit knowledge which is difficult to transfer between firms. To create advantages based on tacit knowledge and innovation, both related and supporting industries can join forces and establish clusters based on research and development, which could result in new products or new technology (Porter, 1991; 1998).

### ***Government***

The external attribute of Government refers to the policymaking that takes place in each country separately. Governments are responsible for making the laws and rules that all firms in an industry have to obey (Dixit & Joshi, 2011). The Government will therefore always have a big impact on the four main attributes that creates the competitive advantages on national level. An increased tax rate would decrease the advantage, while a decreased tax rate would have opposite effect.

## *Change*

The external attribute of Change refers to events that firms and governments have no control over due to the facts that these changes happen somewhere far away from their locations but still might affect the industry either positively or negatively. An increased global demand for a certain product would increase the competitive advantage on a national level while decreased global demand would have opposite effect (Dixit & Joshi, 2011).

## **2.2 Theories of comparative advantages**

The theory of comparative advantage, which originates back to the British economist David Ricardo (1772 – 1823), tries to explain why nations should trade goods with each other (Smit, 2010). Ricardo argued that nations could gain from free trade if they concentrated their production on goods they could produce with less labor intensity (comparative advantage) and trade some of those goods for other goods that could be produced with much less labor intensity in other nations. Ricardo's theory only used labor as a factor of production and it did not explain the direction of trade (ibid.).

Other theories of why nations should engage in trading goods with each other based on comparative advantage and explains the direction of trade have emerged with the Heckscher-Ohlin model as the most prominent one (Smit, 2010). The Heckscher-Ohlin model asserts that nations should export goods that use production factors they have in abundance, and import goods that use production factors they lack from other nations. Comparative advantages will therefore induce countries to specialize in certain industries.

Hunt & Morgan (1995) saw comparative advantage in a different perspective when they claimed that comparative advantage on the resource side was a foundation for competitive advantage in the market place. Hunt & Derozier (2004) modified this theory later as a Resource-advantage theory. Hunt and Morgan's theory was written with firm level in mind but has the property that it can be upgraded to a broad industry level, which makes comparison between industries in different countries relatively easy.

Hunt & Morgan (1995) criticized the neoclassical theory around firm's behavior and environment by stating among other that demand is not homogeneous. Consumers and firms' information are not perfect and costless. Resources are not only capital, labor and land with

the property of being homogeneous and perfectly mobile. Moreover, the role of each firm's management is not to determine quantity and implement production functions.

Their theory stress that demand is heterogeneous because different firms usually produce similar goods in different shapes and sizes with different design and quality. Consumers and firms' information would therefore be imperfect and costly because firms do not get revelations of what consumers needs really are, considering the market segment they are serving. In addition, it takes time for consumers to find out which firm (label/brand) produces the goods that takes into account their tastes and preferences.

Resources are defined as financial, physical, legal, human, organizational, informational and relational with characteristics of being heterogeneous and imperfectly mobile. It is not that each of these resources alone are different and cannot be moved around easily. Instead, it usually is an assortment of all these resources (unless it is a legal type of resource like a trademark) given the activity of each firm that makes them heterogeneous and imperfectly mobile. No firm can buy exactly the same resource assortment as a successive competitor in the market, imitate it or acquire it from some other sources. Therefore, the role of the management is to; "recognize and understand current strategies, create new strategies, select preferred strategies, implement or manage those selected, and modify them through time" (Hunt & Morgan, 1995:7).

Hunt & Morgan (1995) meant that firms create their own competitive position based on the relative cost of the resources needed to produce their goods, how efficient they produce them and the value they could get for those goods in the market place. If all firms that represent an industry in one country were pooled together as a one mass, it would be relatively easy to measure the costs of resources that industry applies altogether between countries as well as to measure which one would be gaining more value or price for their production on average.

This competitive position as presented by Hunt & Morgan (1995), and later by Hunt & Derozier (2004) can be demonstrated in a matrix form as seen in Fig. 2 (next page).

		<i>Relative resource-produced value</i>		
		<i>Low</i>	<i>Parity</i>	<i>Superior</i>
<i>Relative resource cost</i>	<i>Low</i>	Indeterminate position	Competitive advantage	Competitive advantage
	<i>Parity</i>	Competitive disadvantage	<b>Parity</b>	Competitive advantage
	<i>High</i>	Competitive disadvantage	Competitive disadvantage	Indeterminate position

**Fig. 2.** The competitive position matrix. Source: Hunt & Morgan (1995), and Hunt & Derozier (2004).

Fig. 2 represents a 3x3 matrix with the relative costs for firms or an industry to employ resources (relative resource cost) on the vertical axis, and the value firms or an industry get for their goods in the market place (relative resource-produced value) on the horizontal axis. All together according to that matrix, there exist nine competitive positions.

There is one parity position which means that all firms or industries in that position operate at zero profit meaning that the value (revenue) the firms or the industries earn for all sold goods are just enough to cover the costs they spend to produce the sold goods. There are three competitive advantage positions, were firms or the industries in those positions operate profitably, meaning that the value (revenue) they earn for all sold goods exceeds the costs that are spent producing the sold goods. Moreover, there are three competitive disadvantage positions which means that all firms or the industries in those positions are unprofitable, meaning that the value (revenue) they earn for all goods sold are less than the costs that are spent producing the sold goods.

There are at least two indeterminate positions which means that it is unknown if the firms or the industries in such position have competitive advantage, competitive disadvantage or are at parity. What determines that is if the firms or the industries in such position operate with profit or not. If two firms or the same industries in two countries are considered, the firm or the industry that overall pays less for employing the resources they need than its competitor, then that firm or industry is said to have comparative advantage over its competitor (the

vertical axis in fig. 2). Comparative advantage is not a precondition to gain competitive advantage on the market place though (the horizontal axis in fig. 2). What decides if a firm or an industry has competitive advantage over its competitors has to do with what kind of goods the firm or the industry produce given the resource portfolio it employs. What kind of quality those goods have and the demand for those goods.

A firm or an industry can have comparative advantage over its competitor and be in a competitive advantage position, even though it does not manage to earn as much for its goods as its competitor. In such situation, the firm or the industry with comparative advantage would be located in the competitive advantage square, which lies above the parity position square on the competitive position matrix (see fig. 2). The other firm or the industry would be located in the competitive advantage square that lies to the right of the parity position square (see fig. 2).

A firm or an industry can also have comparative advantage over its competitor but be in a competitive disadvantage position. The competing firm or industry can also be in a competitive disadvantage position even though they earn higher value (revenue) for their goods sold than the firm or the industry that have comparative advantage above them. In such situation, the firm or the industry with the comparative advantage would be located on the competitive disadvantage square, which lies to the left of the parity position square (see fig. 2). The other firm or the industry would be located in the competitive disadvantage square, which is below the parity position square (see fig. 2).

Another situation where a firm or an industry has a comparative advantage over its competitor could be in a competitive disadvantage position while the competing firm or industry is in parity position, given that the competing firm or industry earns higher value (revenue) for their goods sold as mentioned above. When that is the case, the firm or the industry with comparative advantage would be located in the indeterminate square in the upper left corner (see fig. 2). The other firm or the industry would be located in the parity position square (see fig. 2).

It could also be the case that when the firm or the industry with a comparative advantage, has a competitive disadvantage while the competing firm or industry has a competitive advantage. In such situation the firm or the industry with comparative advantage would be located either in the indeterminate square in the upper left corner or in the competitive disadvantage square,

which lies to the left of the parity position square (see fig. 2). Moreover, the other firm or industry would either be located on the competitive advantage square, which lies to the right of the parity position square, or on the indeterminate square in the lower right corner (see fig. 2).

### *Theoretical summary*

Porters Diamond emphasizes that different environments and structural characteristics of nations and regions can contribute to competitive advantage, and the theory has been used by authorities that want to increase the competitiveness of their local industries. Particularly has the argument that rivalry can be positive attracted attention. Governments can also foster local industries by increasing safety and environmental standards (for example, by creating sophisticated demand conditions) or promote collaboration between providers and buyers on a national level, for example by building clusters of related and supporting industries in particular regions. A business can use Porters Diamond to identify the extent to which they can develop international advantage by building on advantages acquired at home.

Hunt and Morgan's theory of comparative advantage emphasize that different costs of employing resources can contribute to competitive advantage because those firms or industries that pay more for employing resources, will be less profitable if they are producing goods that sell for the same price as similar goods produced by firms or industries that pay less for employing similar sets of resources. A business can therefore use Hunt and Morgan's competitive position model to identify their position compared to competing businesses and with that create strategies to either improve or consolidate their business.

Based on the theory of comparative advantage and Porters diamond, I will in this study attempt to answer empirically the following research questions:

*Has the Icelandic whitefish fillet industry created and sustained superior performance over the Norwegian industry? If so, what are those advantages and are they duplicable?*

### *Looking ahead*

Based on my theoretical approach and the research question raised, I will need to find out if there are significant differences in performance between the Norwegian and the Icelandic whitefish fillet industry. In this regard, I will need empirical data that put me in a position where I have data that capture performance measures that are collected from comparable firms (“apples”) during a sufficient period of time that capture different environmental challenges. I will also need data that measures empirically the factors that my theoretical framework proposes and will be the major explanation for different performance among comparable firms in various nations.

In the next chapter, I will present the research design and the methodology chosen to obtain the data needed to answer the research questions posted above.

### 3 Research design

The research design of an empirical study with my theoretical point of departure requires in-depth knowledge of comparative advantage on national level, on factor conditions in the two countries, and the companies' strategic adjustments and structures in the countries where the industries are located. Finally, I will need a dataset of comparable companies in both countries over a time period that covers the concept of sustained.

#### *Different strategic groups*

A methodological problem of analyzing profitability differences on industry level is that such design does not catch that one industry can have different strategic groups with very different characteristics and thus different profitability. In order to say something about the differences in profitability due to competitive advantages, the activities compared must be as similar as possible.

#### *Identical input sold in the same markets*

Systematic differences in the same industry but in different countries can reveal the competitive advantages that companies have been developing in the respective countries (Smit, 2010). In my study, I will attempt to capture this by studying factor conditions in the same industry in two different countries that base their production on the same type of natural resource that is sold in approximately the same markets. Hence, I control for the effects of different factor conditions which according to Porter (1990) can affect corporate strategies and structures and thereby their economic performance.

#### *Relative cost advantages*

A country with lower cost level may have comparative advantage over a country with higher cost level (Hunt & Morgan, 1995). The Norwegian economy has for decades been dominated by a highly profitable oil and gas industry. The wage pressure in this sector has spilled over to other sectors of the economy and contributed to generally high costs in Norway (Holm et al., 2013). High oil prices have also contributed to a stronger Norwegian currency. The costly Norwegian wage level and a stronger Norwegian currency may have imposed a competitive disadvantage on the Norwegian export industry compared to many other countries. In my study, I will attempt to capture the costs and currency effects on firm level by analyzing

different cost items' relative importance in the accounts of the processing companies in the two countries.

#### *«Sustained»*

The companies must be studied over time to uncover whether the attributes they possess can be a source of sustainable competitive advantages. The time perspective is contingent upon the dynamics of the industry structure. Industries that experience higher level of uncertainty in the environment require a shorter time span of the analysis than more stable industries. A key intention of my study is to investigate an industry with frequent and unpredictable changes in the environment. In my context, I have found that a period of ten years (2003-2012) is sufficient to embrace the concept of sustained.

### **3.1 Empirical context**

In this thesis, I will try to meet the requirements for a challenging research design by the choice of empirical context. The setting that I have chosen is the whitefish fillet industry in Iceland and Norway i.e. firms that buy raw whitefish, process and sell whitefish fillets among other products from whitefish species. The selection of firms contains units that are heterogeneous when it comes to size, location and performance.

#### **3.1.1 Same industry, but different national importance**

Iceland and Norway do both have long traditions in harvesting wild fishing stocks. In Iceland, fishing was for the first three to four centuries after the settlement in 874 practiced as a side branch besides agriculture and almost all catch was consumed domestically (Þór, 2002). Export of fish had existed in a relatively small scale up until the 12th century when the export ended completely (ibid.). It was not until the mid-14th century that trading started to increase dramatically when merchants from other nations came regularly to buy fish in exchange for goods that Icelanders needed. Since then, fishing has been the most prominent industry in Iceland. And few years after the Danish monopoly commerce had ended, Iceland began to export their own produced fishing goods again after having not been engaged in exporting fishing goods for several centuries (ibid.).

Fishing has existed in Norway for over 7000 years, but the first source of export is from around 880 [1]. From the 12th century, fish was the main trading item from the trading city Bergen and it is considered that fish was the main trading item for almost 800 years (ibid.).

The importance of fishing as an industry began to diminish in 1970's when valuable oil fields had been discovered within the Norwegian territory. After that, fishing has never regained its relative importance. One way to measure the importance of the fishing industry in both Iceland and Norway is to look at how much the value of fishing export contributes to the total export value from 2000 – 2012. This can be seen in Table 1 below.

**Table 1.** Value contribution of exported fishing goods on total value of export

	Iceland	Norway
<b>2000</b>	49,9 %	5,7 %
<b>2001</b>	47,5 %	5,6 %
<b>2002</b>	46,7 %	5,8 %
<b>2003</b>	46,7 %	5,2 %
<b>2004</b>	47,5 %	4,9 %
<b>2005</b>	47,6 %	4,7 %
<b>2006</b>	43,6 %	4,4 %
<b>2007</b>	35,5 %	4,5 %
<b>2008</b>	30,1 %	3,9 %
<b>2009</b>	34,7 %	5,9 %
<b>2010</b>	33,4 %	6,7 %
<b>2011</b>	34,2 %	5,8 %
<b>2012</b>	35,2 %	5,4 %

Source: Statistic Iceland, Statistic Norway.

Table 1 shows that there is a big difference between Iceland and Norway when the value contribution of fishing goods on the total value of export is considered. The revenue from exporting fishing goods from Iceland was almost the half of the total value in 2000, but has since then declined to be somewhere around one third of the total value. In Norway, the revenue from exporting fishing goods has just been around 5 % from 2000 to 2012. Considering those numbers, it is without a doubt reasonable to state that the importance of the fishing industry in Iceland is more important to the Icelanders than the Norwegian industry is to the Norwegians.

### **3.1.2 Different response to global competition**

The geographical location of the industry plays a pivotal role for the competition since closeness to valuable fishing grounds should help the whitefish fillet industry in both countries to implement fresh fish strategies to differentiate themselves from frozen fish competition abroad where labor costs are lower (Iversen, 2003).

International players with low labor costs and with access to frozen whitefish can produce double frozen whitefish fillets that obtains lower prices in the market (Egeness, 2013), and thus outperform fresh and single frozen whitefish fillets on price.

Differentiated strategies like production of fresh whitefish fillets can therefore be adequate to overcome the competition from double frozen whitefish fillets since such differentiated products are rather difficult to duplicate by countries that cannot harvest whitefish species on their own (Dreyer, 2006; Lorentzen et al., 2006).

Fishing gears employed to catch whitefish does also play an important role for both nations in order to implement strategies to differentiate themselves from competition abroad mainly through product quality. Studies show that raw material (wet whitefish) of higher quality, give more product options and a better price in the market (Henriksen & Sogn-Grundvåg, 2011; Henriksen & Svorken, 2011, Heide & Henriksen, 2013).

Whitefish caught by hooking gears is also considered more suited for processing of fresh fillets than whitefish caught by seines or trawls (Heide & Henriksen, 2013), due to quality reasons (Akse et al., 2013). Moreover, in some cases it might be demanded by customers that whitefish fillets are processed from whitefish caught by hooking gears (long line) (Hagfræðistofnun, 2011).

Transportation of whitefish products to consumer markets does also play an important role. Since Iceland is an island in the North Atlantic Ocean, the transport methods the whitefish fillet industry can use to get their products to the market is either by sea or air. The Norwegian industry on the other hand can also use land transportation since it is part of continental Europe.

Fresh whitefish fillets from Iceland are mainly exported by air (Hagfræðistofnun, 2011) while fresh whitefish fillets from Norway are mainly exported by transportation vehicles (Egeness et al., 2011). The advantage of transporting whitefish fillets by air is that products take shorter time to get to the market than is the case with sea or vehicle transportation.

The disadvantages are that it is more expensive to use air transportation compared to sea or vehicle transportation (Jónsdóttir, 2011), and air transportation does also expose the whitefish fillets to more abusive temperatures than is the case for sea transportation (Mai et al., 2012; Martinsdóttir et al., 2010).

Fresh whitefish fillets are also gaining more competition from thawed fillets, which are gaining a reputation as genuinely fresh fillets. According to Egeness et al. (2010), consumers in the UK are supplied with thawed fillets in self-catering coolers based on frozen whitefish fillets since stores that sell fish, want a steady and predictable flow of goods throughout the year. Thawed fish products can meet this need to a greater extent than genuinely fresh fish products. If consumers feel that the quality of thawed whitefish fillets is satisfactory, then these products can become a serious competitor and a big threat to genuinely fresh whitefish fillets.

For the companies in my sample, localization, fishing method, storage and processing of fish will therefore be important. Nevertheless, when the importance of the fish industry in both Iceland and Norway are considered, it seems to have an effect on how both nations respond to global competition. Both nations produce many different product variants but when the export development of one of the most important products in the fillet industry, namely fresh and frozen whitefish fillets along with fresh and frozen unprocessed whitefish from both countries is analyzed, interesting things are revealed.

Table 2 (next page) shows how the export development for the four aforementioned product categories from both Iceland and Norway during the study period has evolved. The table reveals that Iceland is exporting way more whitefish fillets than unprocessed whitefish while it is exactly the opposite for Norway. This indicates that the Icelandic fish industry is employing a strategy based on creating more value to the whitefish that is brought onshore, while the Norwegian fish industry seems to be pursuing strategies that are based on exporting unprocessed whitefish to competing industries abroad for further processing.

**Table 2.** Percentage share of exported whitefish fillets and unprocessed whitefish, based on volume/weight. Source: Federation of Icelandic Fish Processing Plants and Norwegian Seafood Council.

	<i>Fresh fillets</i>		<i>Frozen fillets</i>		<i>Fresh whole</i>		<i>Frozen whole</i>	
	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway
2003	17,8 %	2,5 %	55,0 %	28,1 %	25,0 %	35,7 %	2,2 %	33,6 %
2004	18,9 %	4,1 %	47,2 %	26,2 %	31,9 %	32,7 %	2,0 %	37,0 %
2005	21,5 %	4,7 %	44,3 %	24,4 %	32,7 %	27,2 %	1,4 %	43,7 %
2006	22,5 %	4,4 %	43,5 %	20,8 %	32,2 %	26,0 %	1,9 %	48,9 %
2007	18,8 %	4,9 %	44,2 %	18,5 %	33,4 %	23,9 %	3,6 %	52,7 %
2008	20,1 %	4,2 %	30,5 %	21,3 %	45,6 %	20,8 %	3,8 %	53,7 %
2009	26,9 %	4,3 %	28,6 %	15,8 %	42,3 %	20,2 %	2,1 %	59,7 %
2010	32,8 %	4,0 %	40,4 %	16,8 %	25,0 %	24,5 %	1,7 %	54,8 %
2011	31,1 %	3,1 %	50,3 %	12,8 %	17,3 %	23,8 %	1,3 %	60,3 %
2012	36,4 %	3,2 %	45,0 %	11,3 %	18,0 %	24,0 %	0,6 %	61,5 %

The response to global competition seems to be rather obvious. The Icelandic whitefish fillet industry is managing to utilize more of the whitefish catches brought onshore than is the case for the Norwegian whitefish fillet industry. Fresh whitefish fillets from Iceland is exported in an increased scale from year to year while in Norway the export of the same product is rather stable at a low scale from year to year. Export of frozen unprocessed whitefish on the other hand tells a different story. Here, Norway was clearly exporting far more of unprocessed whitefish to competing countries while such export from Iceland, barely exist.

### 3.1.3 Different institutional frameworks

The institutional framework surrounding the fishing industry in Iceland and Norway affects the whitefish fillet firms' ability to create good economic results. In Iceland, there are no laws forbidding fish processing firms to own harvesting vessels which makes it possible for them to integrate vertically towards harvesting activities. Firms engage in vertical integration to eliminate transaction costs that occur when they need to purchase goods and services that are vital for the firms operations by acquiring those goods and services internally within the firm (Coase 1937; Williamson, 1971; Porter, 1980). In Iceland, 17 of 20 listed fishing companies were vertically integrated back in 2011 (Knútsson et al., 2011).

Processing plants that are not vertically integrated towards harvesting activities can still get access to whitefish through auction markets which were established in Iceland in 1987 (Knútsson et al., 2008; Knútsson et al. 2010). Also vertically integrated firms use the fish markets to supplement their supply. In the auctions, the firms can also sell species or quantities that they do not need for their own production (Knútsson et al., 2009).

In Norway, an ownership of harvesting vessels by processing firms is forbidden by the Participation Act of 1999. The general rule is that an owner of a harvesting vessel must be an active fisherman. Firms can though hold partial ownership in harvesting vessels (Svorken & Dreyer, 2007) but do not have the ability to control them strategically as is the case in Iceland. Processing firms can though be granted exemptions from this ownership rule through concessions that allows firms to own and operate trawlers to ensure smooth and stable supplies of wet whitefish (Svorken et al., 2006; Holm et al., 2013).

Nevertheless, such concessions are imposed with delivery obligations stating where catches should be delivered, how the price of the catches is determined and how the catches should be processed. A number of studies claim that such delivery obligations have had little impact on firms' profitability (Flaaten & Heen, 2004; Isaksen, 2007; Hermansen et al., 2012).

The fisheries management does also differ in both nations, but they do both employ a quota systems based on total allowable catch (TAC). The general rule is that to engage in commercial fishing, you must have a fishing permit. In Iceland, the Fisheries Management Act of 2006 regulates the fisheries management, which is a reissued version of the Fisheries Management Act of 1990.

A pivotal change in the fisheries management system from 1990 was the movement of the quota year from the calendar year to a specific quota year, which lasts from 1st of September to 31st of August the following year. The reason for the movement of the quota year was to reduce fishing during the summer months when employees in fish processing plants go on holiday and it is in the summer months that fish is more sensitive to damaging (Utanríkisráðuneytið, 2009).

Another change in the management system from 1990 was the implementation of individual transferable quotas (ITQ). The purpose of ITQ was to make fishing more effective in contrast to the former management system aiming to respond to declining fish stocks and prevent over-fishing (Knútsson, 2001; Knútsson et al., 2011). The implementation of the ITQ system made quotas transferable between vessels (ibid.) but quotas had earlier been allocated permanently to harvesting vessels based on their catch history (Eythórsson, 2000).

The rights owner must capture at least 50% of the quota every second year to keep the license. The quotas are transferable subject to certain limitations. A quota owner may dispose maximum 15% of the total catch of a species, and a quota owner is not allowed to sell more than 50% of the quota in the course of a year. There are also geographical restrictions on quota sales (Knútsson et al., 2011).

In Norway, the fisheries management is regulated by the Marine Resources Act of 2008, which replaced the Salt Water Fish act of 1983. The Norwegian quota system is based on an individual vessel quota (IVQ) which was implemented for the coastal fleet in 1990 after the cod stock had collapsed the year before (Hersoug et al., 2000). Nevertheless, quotas for the trawler fleet were implemented already in 1984 as a unit quota being transferable from one trawler to another (Standal & Aarset, 2008).

Individual vessel quota is a system that makes it hard to transfer quotas from one vessel to another. The purpose was to secure decentralized ownership of quota rights (Standal & Arset, 2008). Quotas are today allocated between vessel groups characterized by the size of the vessels using a management tool called the Trawl ladder. The objective is to stabilize the quotas to coastal vessels and with that give the coastal vessels higher share of the total quota (Guttormsen & Roll, 2011). The Trawl ladder is a dynamic system that allocates more quotas to coastal vessels than to the trawler fleet during times with low quotas compared to times when quotas are high. And it is mainly based on historical rights between different gear and vessel group (ibid.).

Pricing of whitefish catches which often reflect uncertainty on the supply side, do also differ between the nations. In Norway, the pricing of fish catches are regulated through the Raw Fish Act of 1951 (this act was recently replaced with “Fiskesalgslagsloven”). The purpose of the Raw Fish Act (now “Fiskesalgslagsloven”) is to secure fishermen in Norway a minimum price for the sale of their catches, which are made through a sales organization owned by the fishermen (“Råfisklaget”). The intention is to stabilize prices and ensure that fishermen are paid a fair share of the catch value.

The situation is rather different in Iceland since vertically integrated firms can engage in direct trade from the harvesting vessels they control to the processing plants they operate. Firms that are not vertically integrated have to buy whitefish supplies from the fish markets.

Pricing of catches in direct trades have been controlled through the Directorate of Fresh Fish Prices since the Directorate of Fresh Fish Prices and the Ruling Committee of Fishermen and Vessel Operators Act of 1998 went into force.

The main purpose of this institution is to monitor landing prices of catches and secure a fair remuneration to each vessels crew members (Eythórsson, 2000; Hagfræðistofnun, 2011). Auction prices for whitefish in Iceland are in general higher than the prices the vertically integrated firms are paying for the same type of whitefish in direct trades. The price differences in recent years have on average varied from 20 % to 45 % (Knútsson et al., 2011).

#### **3.1.4 Differently affected by the financial crisis**

The financial crisis, which shocked the world in 2007/2008, did not affect Norway particularly hard due to the oil wealth that Norway possess. The result of that wealth in conjunction with changes in the competitive terms has made it more difficult for the Norwegian firms to compete, mostly due to higher cost level. A stronger currency has also contributed negatively to an already squeezed industry (Holm et al., 2013).

In Iceland before the financial crisis, firms in the fish processing industry were facing difficulties because the national currency was excessively strong (Knútsson et al, 2008). To cope with stronger currency the Icelandic firms undertook strategic steps to add more value to the end-products both from the up-stream and down-stream links (ibid.). When the financial crisis struck, it had both positive and negative effect on the industry. One positive effect was that the currency depreciated so it became easier to operate since the revenues increased exceedingly without much increase in operating costs. The other side of the coin was that much of the loans that the Icelandic firms had, and still have, were in foreign currencies, which in turn became harder to service. Accordingly, many of the fish industry firms had used their fishing quotas as collateral for loans, which made the situation even worse (Benediktsson & Karlsdóttir, 2011).

#### *Summary of empirical context*

Our review of the empirical context illustrates some of the issues that companies in the Norwegian and Icelandic whitefish fillet industry faces. A substantial uncertainty can be traced to the availability of raw material which may vary in volume and quality over years and throughout a year. However, by using different gears, location, procurement, processing

and storage, the uncertainty around raw material supply creates room for strategic adjustments. In the next sections, I will describe the dataset and present working hypotheses that might explain the key factors for creating better profitability.

### **3.2 Data collection**

In this study, the Norwegian whitefish fillet firms constitute one performance group while the Icelandic whitefish fillet firms constitute another performance group. As I shall explain performance differences between the two groups, I will emphasize comparative advantages (Hunter and Morgan, 1995), factor conditions and firm strategies and structures (Porter, 1990). Domestic demand conditions, I have disregarded since a very large percentage of the seafood products produced in both performance groups are sold in foreign markets. Neither will I take into the account the attractiveness of the seafood clusters (related and supporting industries) that the performance groups are part of, may be different. Analyzing seafood clusters in the context of the research questions is considered being so comprehensive and should be examined separately and is therefore beyond the scope of this thesis.

Unfortunately, it was not possible to collect required data for the two performance groups from similar sources, mainly because the data needed for the Norwegian firms can only be collected from Norwegian sources, while the data needed for the Icelandic firms can only be collected from Icelandic sources. Therefore, the accessibility and quality of the data collected was thereafter.

For the Norwegian performance group, I have used the profitability survey for the fish processing industry carried out by Nofima (from now on called PSFPI) to provide precise data on firm level. PSFPI is an annual survey carried out since 1977 in which production and financial statistics are collected at the firm level. The survey is based on financial statements from all companies in Norway that produce various kinds of seafood. In PSFPI, companies are split into sub-populations depending on their product portfolios and important sources of raw materials.

In my study, I have focused on those companies, which mainly produce fillet products based on wild whitefish species. In the analytical period (2003-2012), the industry structure has been characterized by firms disappearing from the population, being acquired or shutting down the production in parts of the period.

Accounting data for the Icelandic fish processing firms were obtained with help from the food research institute Matís in Reykjavik, Iceland. The selection was 10 firms chosen by experts within Matís who have excellent knowledge about what firms process fresh whitefish fillets. The accounting data were obtained from financial reports from the selected firms for the years 2003-2012, which gave a relatively good overview about the profitability on firm level.

The sampling method may be biased because Norwegian selection contains all firms in the population from the respective period, while the Icelandic selection only contains a sample of ten firms for the same period. The Norwegian population was very unstable. In 2003, the total number of firms processing whitefish fillets was 15, but in 2012, the total number had decreased to four. The Icelandic selection is therefore without a doubt more stable than the Norwegian selection.

Two minor problems appeared with the Icelandic selection while the data was organized and analyzed. The first problem was that data from one of the firms in the selection was missing for 2012 i.e. there are only nine firms in the Icelandic selection for that specific year.

The second problem was that one of the Icelandic firms report their financial statements according to the Icelandic quota year, which starts on September 1st and ends on August 31st the following year. Nevertheless, also this firm was kept in the sample and the accounting variables were treated as if they represented a normal calendar year.

The accounting data from Norway were more detailed than the accounting data from Iceland when it came to some of the operating variables. The solution to this problem was to use industry data from reports carried out by Statistic Iceland.

Data for supply of raw material in Norway were obtained from three sources. The main source on firm level came from Nofima, while data on industry level came from Statistic Norway and from Directorate of Fisheries in Norway. Similar data for Iceland were obtained

from two sources – from Statistic Iceland and from Directorate of Fresh Fish Prices, which is located in Akureyri, Iceland. Data on firm level were not obtainable. Comparisons considering raw material between the Norwegian and the Icelandic industry will therefore in some cases be done with firm level data on the Norwegian side, while industry level data will be used on the Icelandic side.

Data for export of products from Norway were obtained from Norway Seafood Council while similar data from Iceland were obtained from Federation of Icelandic Fish Processing Plants. The prices for exported products from both nations are reported in FOB (Free on Board) values but will be treated as price variables. The Norwegian data considering frozen fillets will include a little proportion of fillets that are produced onboard factory ships but such production is completely excluded from the Icelandic data.

Currency variables from Iceland and Norway were converted into Euros to make many price comparisons between the two countries comparable. The exchange rates were obtained from the Norwegian central bank and the Icelandic central bank. Many comparisons that were carried out in this study were carried out using inflated prices where prices were adjusted by the harmonised indices of consumer prices for the Eurozone with December 2012 as base month.

The time period chosen illustrates the structural turbulence the fillet industry has been through and still is going through. It is of particular interest to study sustainable competitive advantages in a population like this, because the selection process is rapid, and the financial effects of strategic choices are quickly visible. In such setting, the prospects are better to uncover which strategic choices may explain variability in firms' performance.

The design chosen will focus on if the companies that constitute the Icelandic performance group has competitive advantage over the companies that constitute the Norwegian performance group. If the Icelandic whitefish fillet industry has competitive advantage, they will be more profitable than the Norwegian whitefish fillet industry.

### **3.3 Performance measurement**

To measure the industry profitability between Iceland and Norway, recommendations by Schmalensee (1989) were considered. Schmalensee says that profitability can be measured in many different ways but one way that was considered fitting this study, is to employ accounting rates of return on assets or equity.

In the introduction, it was expressed that this study would use several performance measures based on different accounting information to detect where in the accounting data the profitability alters the most. A total of four performance measures were established to measure profitability.

The first performance measure is EBITDA/Total Assets or earnings before interests, taxes, depreciation and amortization on total assets. This measure will reveal if different performance can be explained by differences in underlying operations where real money is in circulation.

The second performance measure is EBIT/Total Assets or earnings before interests and taxes on total assets. This measure will reveal if different performance can be explained by differences in operations where depreciation and amortization is taken into the account.

The third performance measure is EBT/Total Assets or earnings before taxes on total assets. That measure will reveal if different performance can be explained by different financial activities.

The fourth performance measure is Net Profit/Total Equity or Net profit on total equity. This measure will reveal if different performance can be explained by different tax regimes in both countries.

The time frame determines if competitive advantage can be considered sustainable or not, and this study has a time frame of 10 years. The precondition for the industry in one of the nations to be determined having competitive advantage over the same industry in the other nation is that one performance group yields a better score on all the performance measures than the other performance group throughout the period.

The performance measures for profitability, is not sufficient to determine if the industry in one nation has competitive advantage over a competing industry in the other nation. Measurements for the most important factors and the cost of employing them do also play a significant role. Another important measure is how much of the most valuable products each industry can manage to sell and what price they obtain for them. Sets of working hypotheses will be constructed in a way to catch the effects of the factors that are considered most important for an industry in one nation to be able to obtain a sustained competitive advantage over the same industry in the competing nation. However, before those hypotheses will be presented, it should be established which performance group is the best performance group.

### 3.3.1 Performance groups

A problem with the Icelandic performance group was that the selection included different strategic groups. With strategic groups is meant that activities differ across the firms that are considered representing the whitefish fillet industry in Iceland. While analyzing the financial reports for the Icelandic selection, it was established that the firms could be divided into four strategic groups based on their characteristics as can be seen in Fig. 3 below.

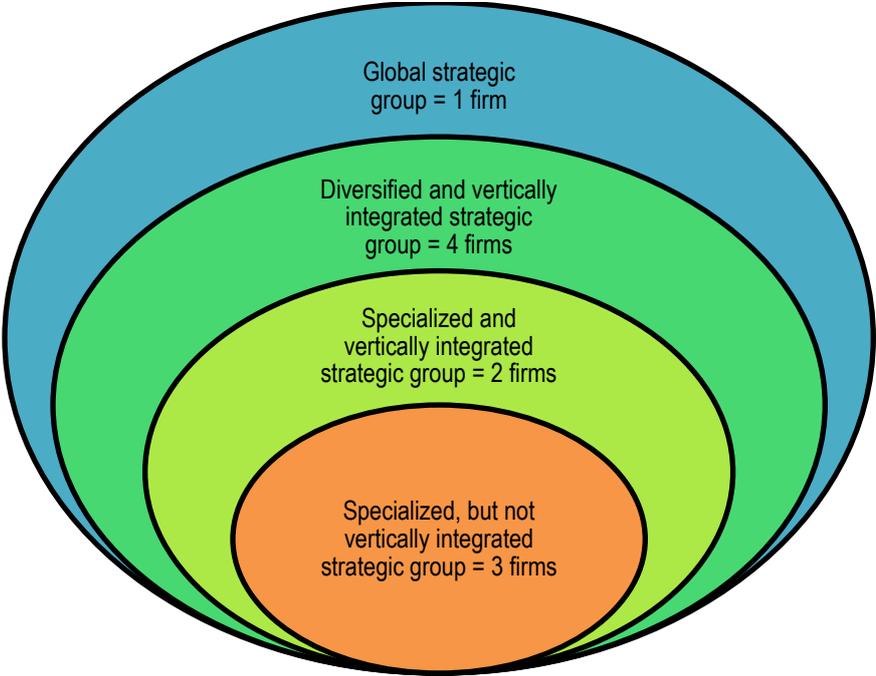


Fig. 3. Strategic groups in the Icelandic sample.

Three firms were considered being specialized whitefish fillet processing firm, i.e. not vertically integrated with any harvesting vessels according to their balance sheets during the time frame of this study. Those firms are therefore considered to buy raw materials for their production in fish markets. Two of those companies held ownership rights in harvesting companies though, but since that is the case for many of the Norwegian companies, they are not considered being totally integrated with harvesting vessels.

Two firms were considered being vertically integrated specialized whitefish processing firm since they had harvesting vessels on their balance sheets during the time frame of this study. The firm that reported their financial statement according to the Icelandic quota year is one of those two firms. Four firms were considered being diversified since along with being vertically integrated whitefish producers, they also harvest, process and sell pelagic species.

One firm was considered being a global firm since it along with being vertically integrated whitefish producer and diversified; it also had harvesting and processing activities in foreign countries mainly through subsidiary companies during the time frame of this study. This firm's financial statements for the year 2012 could not be used. It was not taken into account that many of the firms in Iceland are also vertically integrated towards marketing activities – some are partially integrated while others are completely integrated.

The Icelandic firms according to the strategic groups were subdivided into four performance groups based on what strategic activities they employed. Group one includes all the 10 firms in the Icelandic selection – that is the specialized firms, the vertically integrated whitefish processing firms, the diversified firms and the global firm, from now on called *Iceland 1*.

Group two is a group where the global firm has been ruled out so it includes 9 firms from the Icelandic selection. That is the specialized firms, the vertically integrated whitefish processing firms and the diversified firms, from now on called *Iceland 2*.

Group three is a group where the global firm and the diversified firms have been ruled out so it includes 5 firms from the Icelandic selection. That is the specialized firms and the vertically integrated whitefish processing firms, from now on called *Iceland 3*. Group four is a group where only the specialized firms from the Icelandic selection are included, from now on called *Iceland 4*.

### 3.3.2 The best performer

Comparison between the performance groups based on the performance measures that were discussed earlier can be seen in Table 3 below.

**Table 3.** Profitability differences between the Icelandic and Norwegian performance groups (weighted average). Source: PSFPI for the Norwegian population and Annual yearly statements for the Icelandic sample.

<b>EBITDA/Total Assets</b>				<b>EBITDA/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 1	13,49 %	0,0017	****	Iceland 2	12,36 %	0,0020	****
Norway	2,98 %	0,0006		Norway	2,98 %	0,0006	
<b>EBIT/Total Assets</b>				<b>EBIT/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 1	8,36 %	0,0015	****	Iceland 2	7,79 %	0,0020	****
Norway	0,04 %	0,0005		Norway	0,04 %	0,0005	
<b>EBT/Total Assets</b>				<b>EBT/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 1	5,5 %	0,0033	***	Iceland 2	3,62 %	0,0059	**
Norway	-2,0 %	0,0010		Norway	-1,98 %	0,0010	
<b>Net Profit/Total Equity</b>				<b>Net Profit/Total Equity</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 1	13,8 %	0,0220	*	Iceland 2	7,8 %	0,0485	-
Norway	0,4 %	0,0189		Norway	0,4 %	0,0189	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			
<b>EBITDA/Total Assets</b>				<b>EBITDA/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 3	10,84 %	0,0036	***	Iceland 4	10,53 %	0,0136	*
Norway	2,98 %	0,0006		Norway	2,98 %	0,0006	
<b>EBIT/Total Assets</b>				<b>EBIT/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 3	7,27 %	0,0043	***	Iceland 4	6,12 %	0,0141	-
Norway	0,04 %	0,0005		Norway	0,04 %	0,0005	
<b>EBT/Total Assets</b>				<b>EBT/Total Assets</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 3	-1,06 %	0,0327	-	Iceland 4	-2,96 %	0,0374	-
Norway	-1,98 %	0,0010		Norway	-1,98 %	0,0010	
<b>Net Profit/Total Equity</b>				<b>Net Profit/Total Equity</b>			
Groups	Mean	Variance	Significance	Groups	Mean	Variance	Significance
Iceland 3	43,7 %	2,1696	-	Iceland 4	1095,0 %	900,317923	-
Norway	0,4 %	0,0189		Norway	0,4 %	0,0189	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			

In Table 3, I first compare Iceland 1, which is the total sample of 10 heterogeneous firms (see Fig. 3) with the Norwegian population using single factor ANOVA test. As can be seen, the Icelandic sample outperforms the Norwegian population significantly on all four performance measures.

Moreover, when the global player is excluded from the Icelandic sample (Iceland 2), the last performance measure difference (Net Profit/Total Equity) is no longer significant. When I continue by removing the diversified and vertically integrated firms from the Icelandic sample (Iceland 3), neither EBT/Total Assets nor Net Profit/Total Equity are significant. Finally, when comparing the specialized but not vertically integrated Icelandic firms with the corresponding Norwegian strategic group (comparing “apples” with “apples”), the performance difference is only significant at the 10% level on EBITDA/Total assets. What the Icelandic strategic group gains operationally, it loses financially versus its comparable Norwegian competitor.

All the Icelandic groups perform better operationally than the Norwegian population. However, the performance difference decreases as I remove less relevant strategic groups from the Icelandic sample. The performance differences also decline when I also take financial matters into account.

To summarize, Table 3 shows that Iceland has the significant best operational performance for all four groups during the analyzing period. In this study, I therefore feel that it is reasonable to claim that I have now established an empirical basis for making a systematic analysis of the properties that may explain performance differences between the groups.

My measure of performance is in line with previous research and studies of the profitability of the fishing industry in Iceland and Norway. The profitability of the fishing industry in Iceland in general, is described in a report by Íslandsbanki (2012) as rising from the year Iceland implemented its transferable quota system. The report states further that the average EBITDA margin for the fishing industry was 29% in 2010, compared with 16% in 2004. Possible explanations for this increased margin is of course the financial crisis that hit Iceland with full force in autumn 2008, with a dramatic fall in the exchange rate as one of the consequences.

In Norway, there is a different story when it comes to the whitefish industry in particular. In a report by Grimsmo and Digre (2012), the profitability of the whitefish industry is characterized as too bad. Little new technology development has taken place over the last 30 years in the Norwegian whitefish industry. The report presents technical solutions for both the harvesting sector and the processing sector on land, which they believe will lead to both higher profitability and higher quality if implemented.

With this being settled, I will continue to develop working hypotheses in an attempt to explain the variation in profitability between the two performance groups.

### 3.4 Working hypotheses

In this section, I will present the working hypotheses related to my research questions:

*Has the Icelandic whitefish fillet industry created and sustained superior performance over the Norwegian industry? If so, what are those advantages and are they duplicable?*

In the discussion, I will attempt to connect the hypotheses to the study’s theoretical framework as illustrated in Fig. 4.

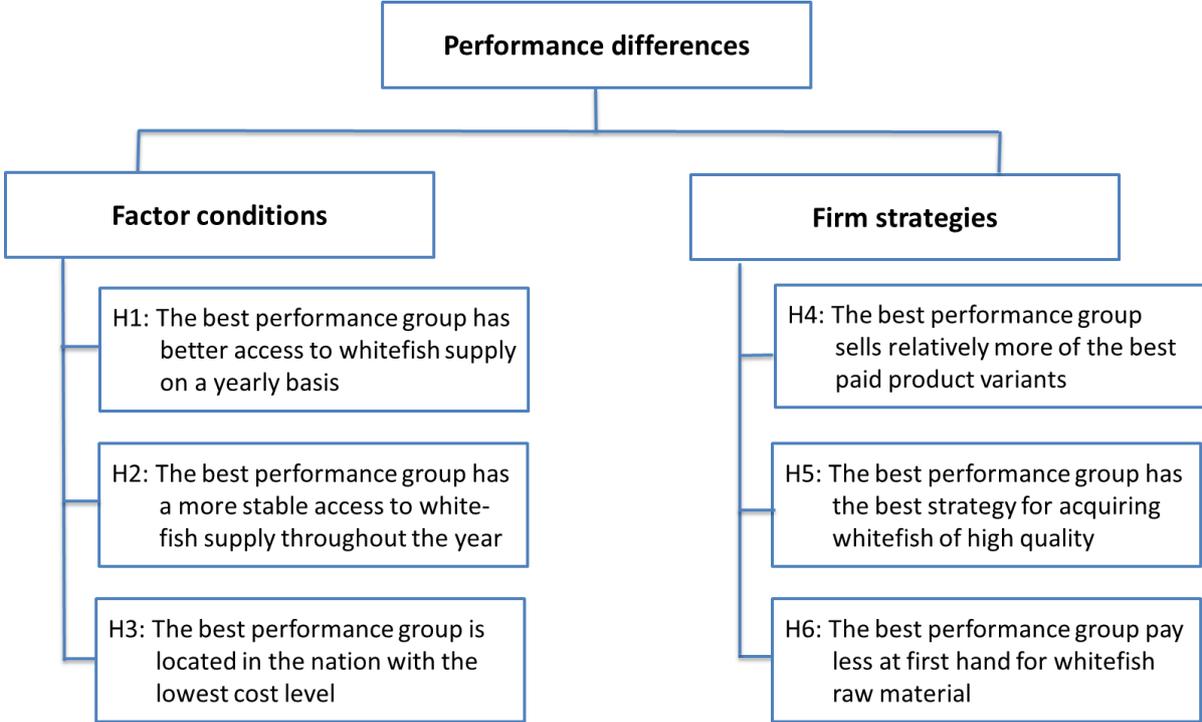


Fig. 4. Working hypotheses, an overview.

In the following three subsections, I will start by developing working hypotheses related to factor conditions (see Fig. 4).

### **3.4.1 Access to whitefish resources**

Both Iceland and Norway have introduced 200 nautical mile zones to protect their fish stocks against overfishing by foreign vessels. Moreover, they have introduced annual quotas to prevent stocks from being overfished by domestic fishermen. Biological conditions have however, created an uneven access to resources for the industries in both nations because they are based on raw materials that are harvested from a wild whitefish resource. The resource access is based on biology and other factors that are beyond the companies' control (Milliken, 1987).

The main input needed to keep the whitefish processing firms operating is sufficient supply of whitefish. If there is no fish landed, the industry cannot operate. On the other hand, if a lot of fish is landed the profit potential will be substantial. A problem that both nations face, is that whitefish is a resource that lives wild in the ocean. To be able to supply it onshore it needs to be harvested in- and offshore given the rules and regulations of the fisheries management in both nations. One important matter that I will expect is that the total catch of whitefish is higher in the nation where the best performance group is located. The processing industry in the nation catching most whitefish is expected to have the biggest throughput and with that gain an economics of scale advantage over its rival. Therefore, the following hypothesis is raised:

***Hypothesis 1:** The best performance group is located in an environment where access to whitefish on a yearly basis is higher.*

### **3.4.2 Supply patterns throughout the year**

Another important matter is how the supply of whitefish is throughout the year. If the supply varies from month to month, then the production capacity will not be utilized in an efficient manner given that the capacity is fixed as it usually is in the short run. It is also difficult for companies to be able to supply the market at any time if the supply of raw materials varies widely. In the fall, it is especially important to be able to deliver fresh fish when the supply is limited and triggering higher prices in the market place.

An even supply throughout the year would be more optimal for the whitefish fillet industry, both from a cost and price perspective. Biological conditions however, create an uneven

distribution of the supply of whitefish in both nations. The accessibility for whitefish is primarily based on biology or state of the nature (Ottesen & Grønhaug, 2003) which causes a big uncertainty that no firm can control (Milliken, 1987).

Variation in production volumes over the year is one of the biggest challenges for fillet companies (Lorentzen et al., 2006). In Norway, there is a distinct seasonal landing pattern through the year (Nilssen et al., 2014). There seems to be less seasonal variation in landing pattern of demersal species in Iceland, although there is a seasonal peak during wintertime (Knútsson et al., 2011). I would therefore think that the best performance group has a more evenly distributed and stable supply of whitefish throughout the year. Therefore, the following hypothesis is raised.

***Hypothesis 2: The best performance group is located in an environment where the whitefish supply throughout the year is more stable.***

### **3.4.3 Cost levels**

A high general price level creates problems for export-oriented industries no matter if it is labor costs, administrative costs, financial cost, or other material costs etc. Those costs usually depend on the macroeconomic environment in each nation. Norway has for a long time been regarded as a nation with an extremely high price level in an international perspective because of their oil wealth which also has affected other sectors in the economy. Norway had Europe's highest price level in 2012 (Statistics Norway), and Norwegian currency (NOK) has been considered one of the strongest currencies during the great recession. Iceland was also for a long time regarded as a nation with high price level in an international perspective, but that changed in 2008 when Iceland was struck by the financial crisis. The financial crisis led to the collapse of all three privately owned banks in Iceland, which were nationalized and merged. In relation to the country's economy, this was the biggest bank collapse that has ever taken place, and the Stock Exchange lost 90% of its value. The Icelandic currency (ISK) plummeted in value and the economy went into recession. In this context, I assume that:

***Hypothesis 3: The best performance group is located in the environment with the lowest cost level.***

In the following three subsections, I will develop working hypotheses related to firm strategies and structures (see Fig. 4).

#### **3.4.4 Marketing strategies**

To be able to compete against nations with lower labor costs that produce double frozen fillets the industry in both Iceland and Norway need to pursue differentiating strategies that involves either producing fresh whitefish fillets or single frozen whitefish fillets (Iversen, 2003). Fresh whitefish fillet is a product that is more valuable to customers than frozen whitefish fillet or even fresh whole whitefish, but it might come at a cost to produce such differentiated products that could possibly eat up the additional revenue the industry gets to produce it. However, as long as the additional revenue is higher than the additional cost of producing fresh whitefish fillets, it would obviously be the best strategy to produce as much of the fresh whitefish fillets as long as there are buyers out there for such a differentiated product. Therefore the following sub-hypothesis is raised:

***Hypothesis 4a:** The best performance group sells relatively more of fresh products than frozen.*

As discussed in the introduction, the migratory pattern of the whitefish species (especially cod) has resulted in a seasonally based fishing in Norway due to economic reasons (Nilssen et al., 2014). This season takes place in the first half of each year where most of the harvesting (of cod at least) takes place (ibid.). When a bigger proportion of the total catch on yearly basis takes place in the first half of the year as is the case for cod, this implies that there is less production of fresh cod fillets in the second half of the year. And if the law of supply and demand is taken into account, one would expect that the price of fresh fillets is higher in the second half of the year compared to the first half of the year. Therefore the following sub-hypothesis is raised:

***Hypothesis 4b:** The best performance group sells more of fresh fillets in the second half of the year when the supply is limited and the prices are higher.*

### **3.4.5 Raw material procurement strategies**

To pursue differentiated high quality/high price marketing strategies, I would expect that the firms in the whitefish fillet industry would take into account that the quality of the wet whitefish supply is of a high standard. The fishing gears that are used to catch whitefish do play an important role when it comes to the overall quality of the fish that are used in processing whitefish fillets. Netting gears like bottom trawls, Danish seine and gillnets are more likely to cause damages on the fish than hooking gears like long line and hand line (Akse et al., 2013). Whitefish fillets that have no visible damages are more attractive and valuable products in the eyes of the customers than whitefish fillets that are showing visible damages. To secure highest possible quality for the supply of whitefish, I would expect the best performance group to be executing procurement strategies that secure them a better quality of whitefish. Therefore the following hypothesis is raised.

***Hypothesis 5:** The best performance group acquires more whitefish which is caught by hooking gears.*

### **3.4.6 Raw material prices**

It is important that the companies are focusing on minimizing raw material costs, because the price of the input factor has a major impact on the companies' financial performance. In Norway, raw material costs account for between 60 to 85% of the firms' total costs (Bendiksen, 2013). The Raw Fish Act curbs price fluctuations In Norway. In Iceland however, there is no Raw Fish Act or Participation Act. There, the fishing fleet and the whitefish fillet companies can be vertically integrated, which they are to a great extent (Knútsson et al., 2008; Knútsson et al., 2011) Moreover, Icelandic companies that are not integrated can buy fish on national fish auctions (Knútsson et al., 2010). In this study, I have operationalized the raw material cost variable by calculating the average of annual raw material cost per species (cod, haddock, and saithe) and divided it on the annual quantity per species. In this context, I assume that:

***Hypothesis 6:** The best performance group pay less for raw materials at first hand than does the other performance group.*

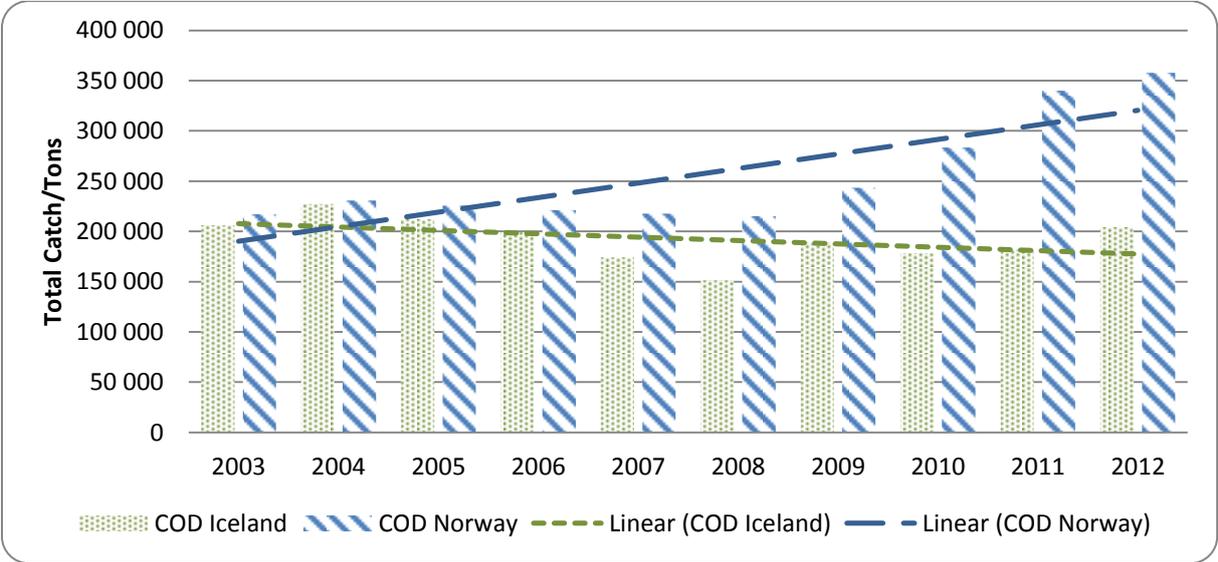
# 4 Results

I have previously described how financial performance is measured and how these measurements have provided the basis for establishing two performance groups of fillet companies, one in Iceland and another one in Norway (see table 3). Now, my concern is to measure similarities and variations in the input and output supply patterns between the performance groups enabling me to reject or confirm the hypotheses I have developed. In this section, I will present my empirical findings in the same order as in the analytical model (Fig. 4).

I will start by reporting results for the hypotheses related to factor conditions.

*Hypothesis 1: The best performance group is located in an environment where access to whitefish on a yearly basis is higher.*

According to Hypothesis 1, I expect that the access to whitefish raw material would be an important value driver for the fillet companies. Fig. 5, 6, and 7 illustrate the yearly catches of cod, haddock, and saithe that the two performance groups could have gotten access to, during the study period.

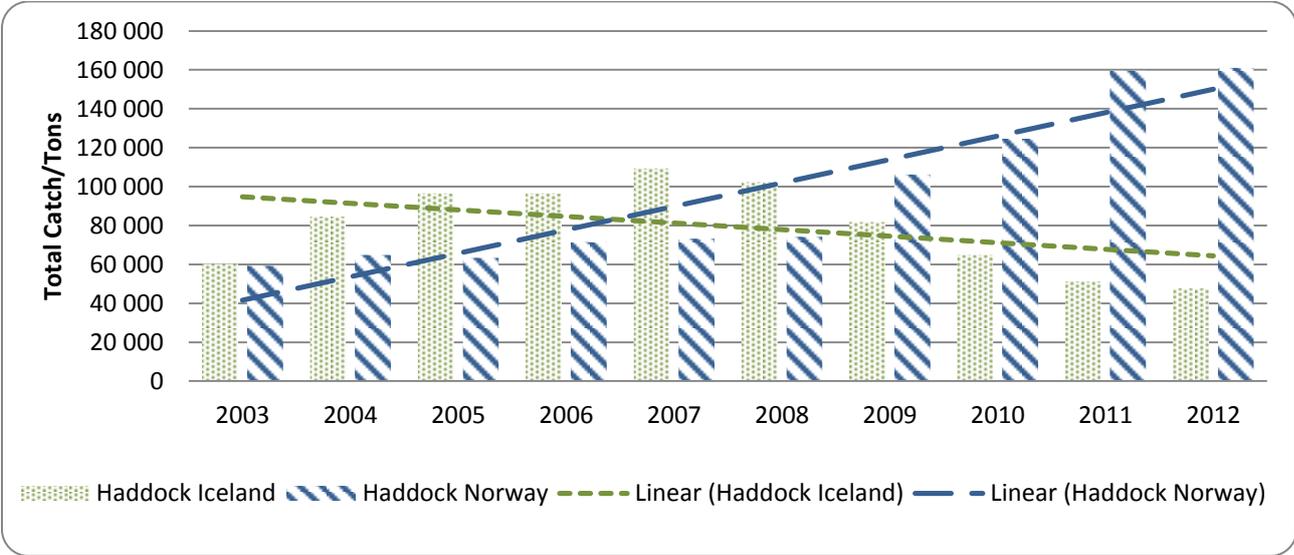


**Fig. 5.** Cod catch in Iceland and Norway in the period 2003-2012. Sources: Statistic Iceland and Statistic Norway.

Fig. 5 shows the total catch of cod in tons by Icelandic and Norwegian vessels yearly during the study period. Iceland caught a bit less cod than Norway in the period 2003 to 2006, but since 2007 Norway has had significantly more cod catches in tons than Iceland. The mean

catch and standard deviation during the period for Iceland was 192.555 tons and 21.917 tons. For Norway it was 255.367 tons and 53.474 tons respectively. The mean indicates that Norway had a better supply condition for cod on a yearly basis, but the standard deviation indicates that the supply condition for cod is more volatile in Norway, especially from 2008 to 2012 when the total catch rose from 215.444 tons up to 357.951 tons. The trendline for Iceland in Fig. 5 goes slightly downwards, while for Norway it goes steeper upwards.

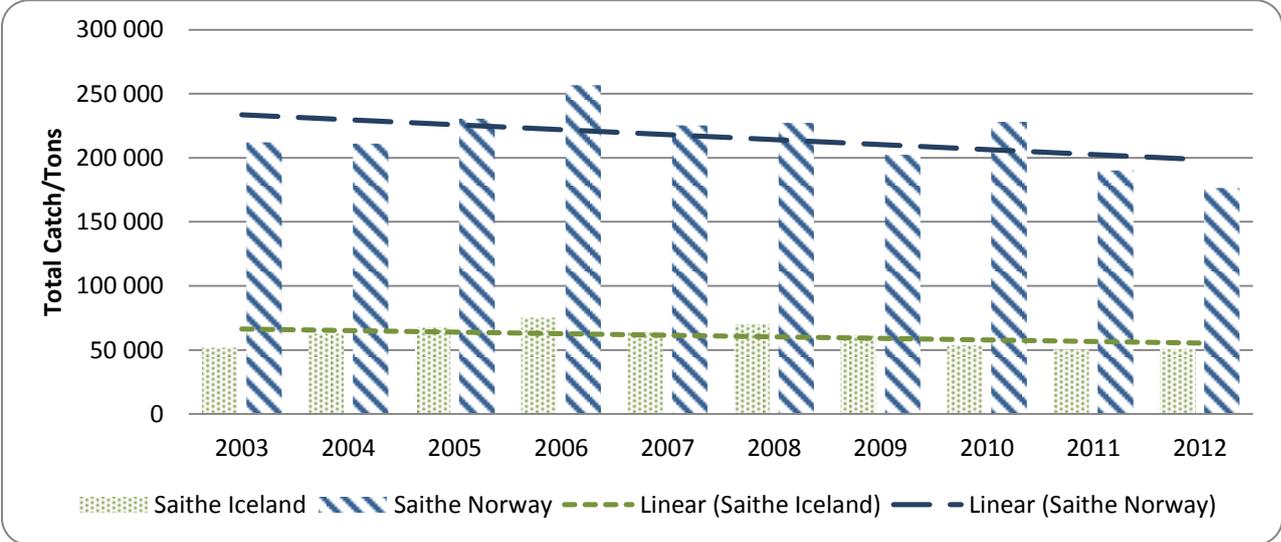
Fig. 6 below shows the total catch of haddock in tons by Icelandic and Norwegian vessels yearly during the study period.



**Fig. 6.** Haddock catch in Iceland and Norway in the period 2003-2012. Sources: Statistic Iceland and Statistic Norway.

Iceland caught more haddock than Norway in the period 2003-2008, but from 2009 Norway had gradually more catches of haddock than Iceland. The total catch has increased in Norway while it has decreased in Iceland. The mean catch and standard deviation during the period for Iceland was 79.576 tons and 22.141 tons, while for Norway it was 95.814 tons and 39.663 tons. The mean indicates that Norway had a better supply condition for haddock on a yearly basis even though Iceland had more supply in the years between 2003 and 2008. The standard deviation indicates that the supply condition for haddock is more volatile in Norway than in Iceland on a yearly basis. The total catch of haddock in Norway seems to have developed in the same direction as the total catch of cod in the period from 2008 to 2012 when the total catch increased from 74.299 tons up to 160.977 tons. The trendlines in Fig. 6 confirm that the haddock supply in Norway is more volatile than in Iceland. The trendline for Iceland goes in a slightly downward direction while it for Norway goes sharply upwards.

Fig. 7 below shows the total catch of saithe in tons by Icelandic and Norwegian vessels yearly during the study period.



**Fig. 7.** Saithe catch in Iceland and Norway in the period 2003-2012. Sources: Statistic Iceland and Statistic Norway.

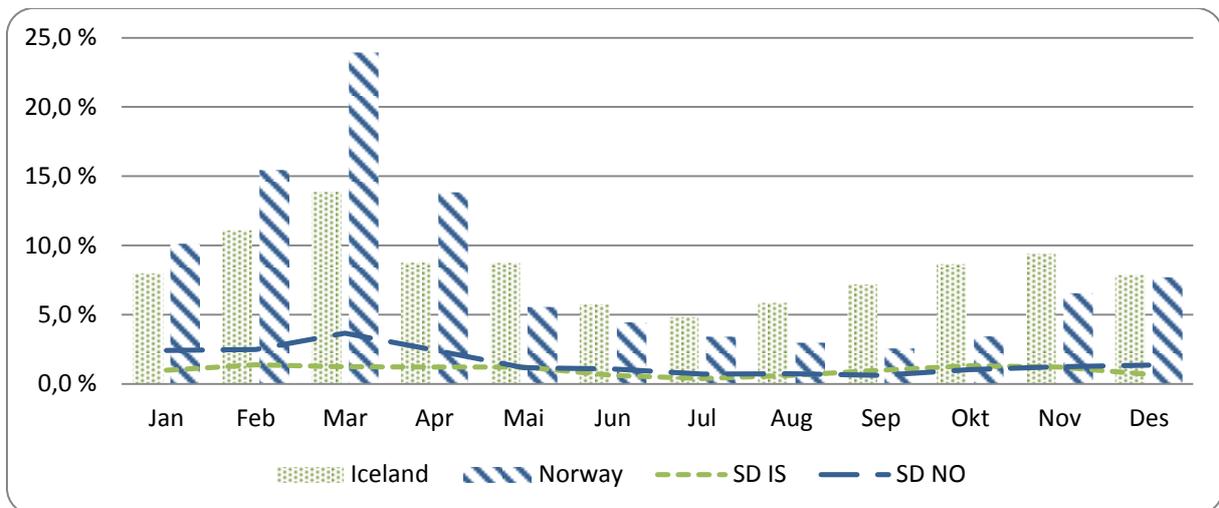
Norway catch up to three to four times more of saithe than Iceland does. The mean catch and standard deviation during the period for Norway was 216.098 tons and 22.823 tons, while for Iceland it was 60.915 tons and 8.790 tons. The mean indicates that Norway had a way better supply condition for saithe on a yearly basis than Iceland, but the standard deviation indicates that the supply condition for saithe is a bit more volatile in Norway than in Iceland on a yearly basis. The trendlines in Fig. 7 are both going downwards, but the trendline for Norway is slightly steeper than the trendline for Iceland.

Based on the results in Fig. 5, 6, and 7, I find it reasonable to reject Hypothesis 1. The best performance group is not located in the environment where access to whitefish on a yearly basis is higher. Norway did catch more cod than Iceland every year in the ten year period, and considerably more the last five years (see Fig. 5). When it comes to haddock, Iceland was the biggest catcher until 2008. However, in the last three years of the study period, Norway caught significantly more haddock than Iceland (see Fig. 6). Moreover, Norway’s catch of saithe is approximately four times that of Iceland every year (see Fig. 7).

**Hypothesis 2:** *The best performance group is located in an environment where the whitefish supply throughout the year is more stable.*

For the fillet companies, regular supply of raw material is a precondition for achieving better capacity utilization and profitable production. Fig. 8, 9, and 10 show the landing pattern of the three main whitefish species for the two performance groups.

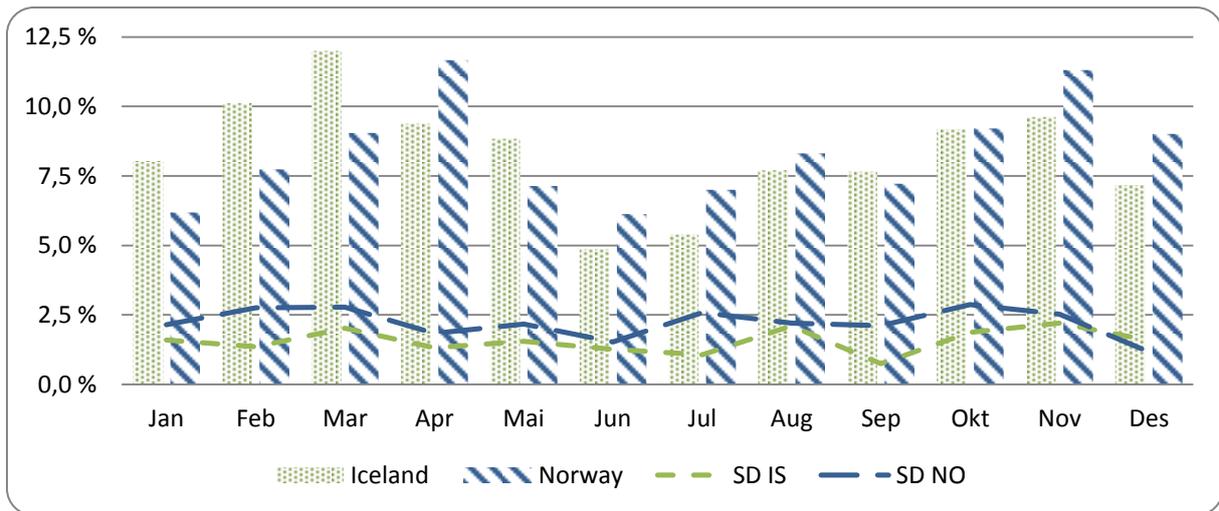
Fig. 8 shows the mean supply of cod between Iceland and Norway every month during the study period.



**Fig. 8.** Monthly supply pattern of cod in Iceland and Norway. Sources: Statistic Iceland and Directorate of Fisheries Norway.

The graph indicates that Iceland had a more stable supply of cod throughout the year than Norway. Norway's catch of cod occurs mainly in the first half of the year, and approximately 73 % of the total catch each year is caught then. In Iceland approximately 56 % of the total catch is landed in the first half of the year which support the indication that Iceland had a more stable supply of cod throughout the year. The standard deviation of the mean supply of cod between Iceland and Norway is around 2.5 % for Iceland while it is 6.5 % for Norway.

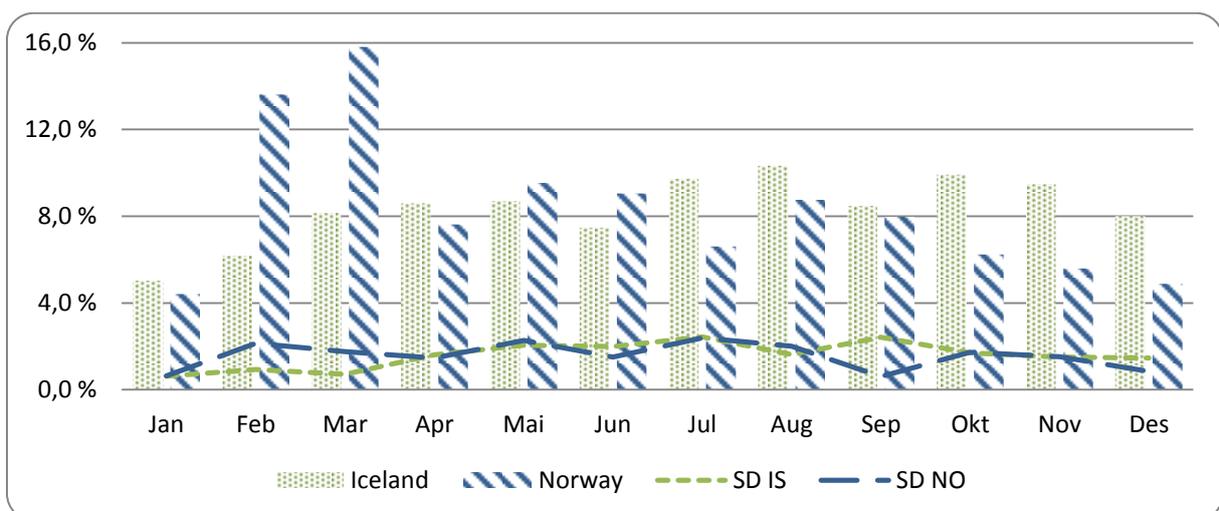
Fig. 9 (next page) shows the mean supply of haddock between Iceland and Norway every month during the study period.



**Fig. 9.** Monthly supply pattern of haddock in Iceland and Norway. Sources: Statistic Iceland and Directorate of Fisheries Norway.

The graph does not indicate whether Iceland or Norway had a more stable supply of haddock throughout the year. Iceland's catch of haddock in the first half of the year is approximately 53 % of the total catch each while for Norway it is approximately 48 %. The standard deviation of the mean supply of haddock between Iceland and Norway is around 2 % for Iceland while it is 1.8 % for Norway which might indicate that Norway had a slightly better supply condition of haddock throughout the year.

Fig. 10 shows the mean supply of saithe between Iceland and Norway every month during the study period.



**Fig. 10.** Monthly supply pattern of saithe in Iceland and Norway. Sources: Statistic Iceland and Directorate of Fisheries Norway.

The graph indicates that Iceland had a more stable supply of saithe throughout the year due to the high proportions of catches that Norway has in February and March. Norway's catch of saithe in the first half of the year is approximately 60 % of the total catch each year while for Iceland it is approximately 44 %. The standard deviation of the mean supply of saithe between Iceland and Norway is around 1.5 % for Iceland while it is 3.4 % for Norway, which might indicate that Iceland had a better supply condition of saithe throughout the year.

A different way to measure if Iceland or Norway had the better supply condition for whitefish throughout the year is to measure how much the supply each month deviates from the optimal supply condition which would be 1/12 of the total catches each month or 8.33 %.

Table 4 shows how much the mean supply of each of the whitefish species each month deviates from the optimal supply throughout the year.

**Table 4.** Monthly deviation from optimal supply condition.  
Source: Statistic Iceland and Directorate of Fisheries Norway.

<b>Cod</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	2,0 %	0,0003	****
Norway	5,1 %	0,0016	
<b>Haddock</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	1,9 %	0,0002	-
Norway	2,3 %	0,0003	
<b>Saithe</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	1,8 %	0,0002	****
Norway	2,8 %	0,0005	

\* P < 10 %, \*\* P < 5 %, \*\*\* P < 1 %, P < 0,1 %

For cod, Iceland deviates about 2 % from the optimal supply each month on average while Norway deviates about 5.1 % each month on average. A single factor ANOVA test of the deviations, confirm that Iceland had better supply condition throughout the year for cod with a significance level of less than 0,1 %. For haddock, Iceland deviates about 1.9 % from the optimal supply condition each month on average while Norway deviates about 2.3 % each month on average. A single factor ANOVA test of the deviations do not confirm that either nation had better supply condition throughout the year for haddock. For saithe, Iceland deviates about 1.8 % from the optimal supply condition each month on average while Norway deviates about 2.8 % each month on average. A single factor ANOVA test of the deviations,

confirm that Iceland had better supply condition throughout the year for saithe with significance level of less than 0,1 %.

Fig. 8, 9, and 10 show that both performance groups utilize a raw material which is based on a season-based fishery. Firms in the best performance group, however, experience the least seasonal variation for the species cod, and saithe while there was no significant deviation for haddock between the performance groups according to the single Factor ANOVA tests. Since the results indicates major differences for cod and saithe between the performance groups, it is reasonable to respond affirmatively to Hypothesis 2 that the best performance group has a more stable supply of raw materials throughout the year than the other group does.

***Hypothesis 3: The best performance group is located in the environment with the lowest cost level.***

Table 5 shows the price level indices for Iceland and Norway during the study period.

**Table 5.** Price level indices for Iceland and Norway during the study period.

Source: Statistic Norway referring to Eurostat.

	<b><i>Iceland</i></b>	<b><i>Norway</i></b>
2003	129	135
2004	129	128
2005	152	133
2006	150	133
2007	159	135
2008	105	136
2009	96	136
2010	107	148
2011	110	153
2012	112	156

The price level indices show the price level in a nation compared to another nations. It is defined as the purchasing power parity divided by the exchange rate in each country (EU27 = 100). Table 5 shows that the price level in Iceland was lower than the Norwegian price level in the beginning of the analyzing period. Moreover, Norway had a lower price level than Iceland between 2004 and 2007, but from 2008 to 2012, the Norwegian price level has been considerably higher than the Icelandic.

Table 6 below shows the cost level relative to turnover for employing the most important sets of resources which the whitefish fillet industries need to operate. Obviously I am not comparing “apples” to “apples” here, but it was considered that the data I managed to get for the whitefish segment would give a reasonable overview of how the percentage share of the most important input factors were distributed. Data for separate cost variables from Iceland were not published in the financial statements for most of the firms.

**Table 6.** Relative cost levels for employing resources in the whitefish processing industry (fresh, frozen, and whole fish).

Sources: PSFPI and Statistic Iceland.

<b>Cost of Goods Sold/Turnover(revenue)</b>			
<i>Groups</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	64,8 %	0,0007	****
Norway	71,4 %	0,0015	
<b>Labor Cost/Turnover(revenue)</b>			
<i>Groups</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	16,8 %	0,0016	-
Norway	17,5 %	0,0003	
<b>Other Operating Costs/Turnover(revenue)</b>			
<i>Groups</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	6,6 %	0,0001	***
Norway	9,1 %	0,0006	
<b>Depreciations/Turnover(revenue)</b>			
<i>Groups</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	2,6 %	0,00003	***
Norway	2,0 %	0,000006	
<b>Financial Costs/Turnover(revenue)</b>			
<i>Groups</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	7,6 %	0,0212	-
Norway	1,7 %	0,0002	

\* P < 10 %, \*\* P < 5 %, \*\*\* P < 1 %, \*\*\*\* P < 0,1 %

When comparing Cost of goods sold/Turnover in the two industries, I can see that the percentage share, which is the far most important factor of production, is lower in Iceland than in Norway. In the study period, the Icelandic whitefish fillet processing industry spent around 64,8 % of their total revenues on cost of goods sold compared to 71,4 % in Norway. A single factor ANOVA test confirms that the industry in Iceland spent relatively less than the industry in Norway on this cost item with a significance level of less than 0,1 %.

In Iceland, the whitefish fillet industry spent just above 16,8 % of their total revenue during the study period on labor compared to just above 17,5 % for the industry in Norway in the same period. The difference of 0,7 % is not significant according to a single factor ANOVA test.

The whitefish fillet processing industry in Iceland spent around 6,6 % of their total revenues on other operating cost during the study period, while the industry in Norway spent around 9,1 % of their total revenue on operating cost during the same period. The difference of around 2,5 % is confirmed in a single factor ANOVA analysis of being significant with significance level of less than 1 %.

The whitefish fillet processing industry in Iceland depreciated and amortized their assets with a cost that counted for 2,6 % of the total revenues during the analyzing period. The same figure for the industry in Norway was 2,0 %. All together, the difference was confirmed to be significant at 1 % level

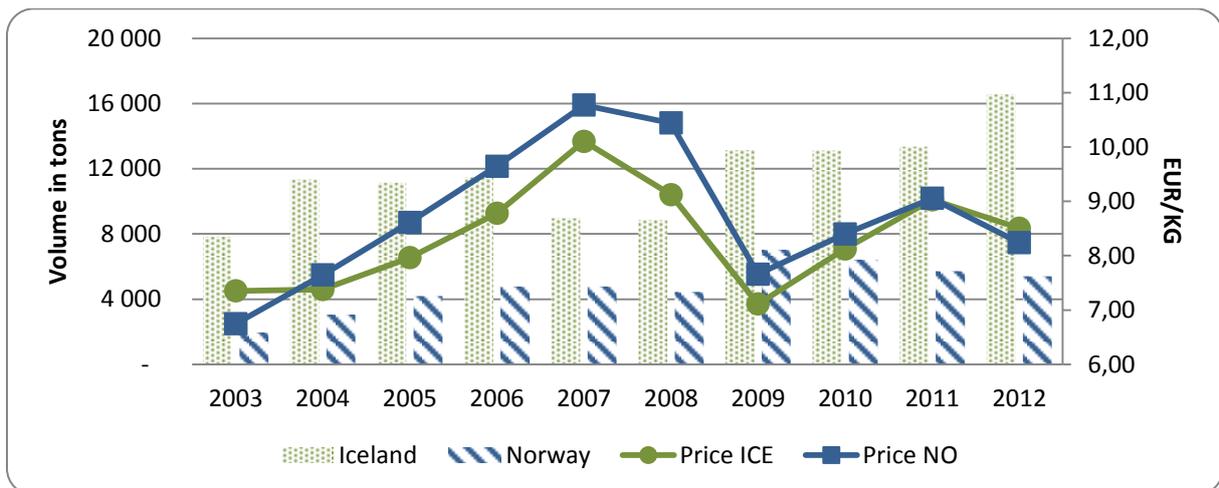
The financial costs in Iceland during the study period was around 7,6 % of total revenues, while the same type of cost in Norway during the same period was 1.7 %. Nevertheless, even though the difference between Iceland and Norway is around 5,9 % it was however not seen as being significant, mainly due to the big anomaly that was in Iceland in 2008.

Based on the results in Table 6 (Cost of goods sold, and other operating costs), I find it reasonable to provide partial support for Hypothesis 3. The price level indices for Iceland and Norway presented in Table 5 did, however, not support Hypothesis 3.

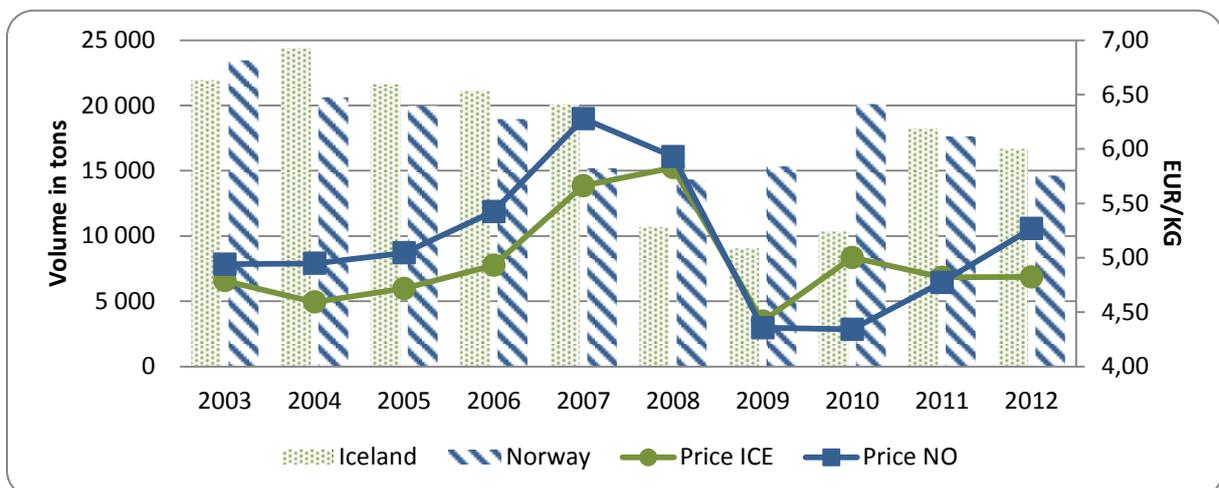
In the following section, I will continue by reporting results for the the hypotheses related to firm strategies.

**Hypothesis 4a:** *The best performance group sells relatively more of fresh products than frozen.*

According to Hypothesis 4a, I expect the price and volumes sold to customers of differentiated fish products to be an important value driver for the fillet companies. Fig. 11, and 12 illustrate the yearly export volume and prices obtained for fresh and frozen cod fillets for the two performance groups in the study period.



**Fig. 11.** The average prices and total volumes of exported fresh cod fillets from Iceland and Norway. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 12.** The average prices and total volume of exported frozen cod fillets from Iceland and Norway. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

Fig. 11 and 12 reveal the average prices and total volume of exported fresh and frozen cod fillets on a yearly basis from Iceland and Norway, respectively. The Icelandic industry exports more of fresh cod fillets compared to the Norwegian industry. However, it varied

relatively which nation exported the most of frozen fillets. The Norwegian industry obtained higher prices on average for fresh cod fillets during the study period except in 2003 and 2012. The Norwegian industry did also obtain higher prices for frozen cod fillets except in the period between 2009 and 2011.

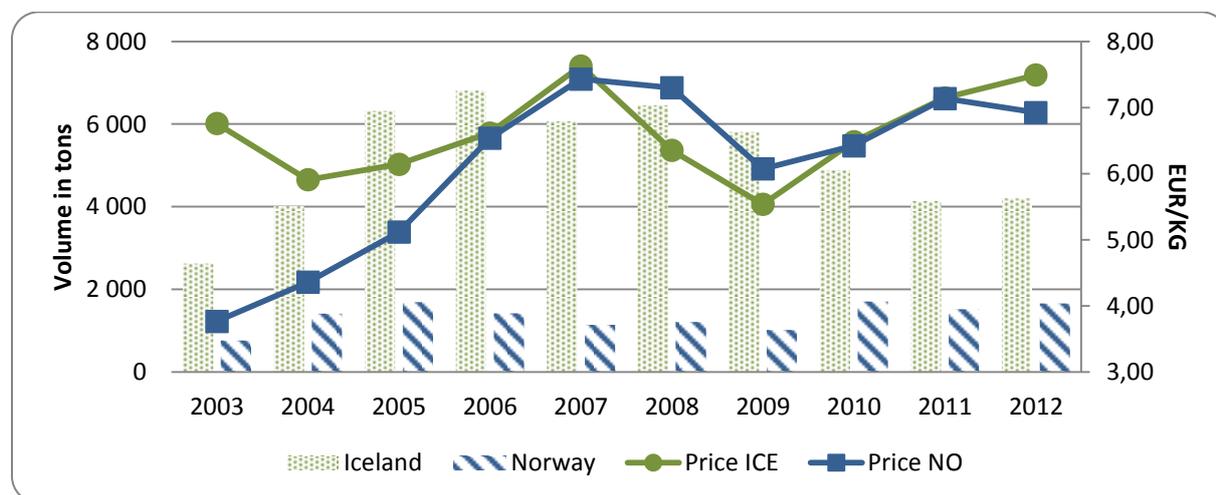
The single factor ANOVA analysis presented in Table 7 shows that the Norwegian industry obtained higher prices for both fresh and frozen cod fillets during the study period with a significance level of less than 0.1 % for fresh cod fillets, and with a significance level of less than 5 % for frozen cod fillets.

**Table 7.** The average prices between fresh and frozen cod fillets in real terms.  
Sources: Norway Seafood Council, Federation of Icelandic Fish Processing Plants.

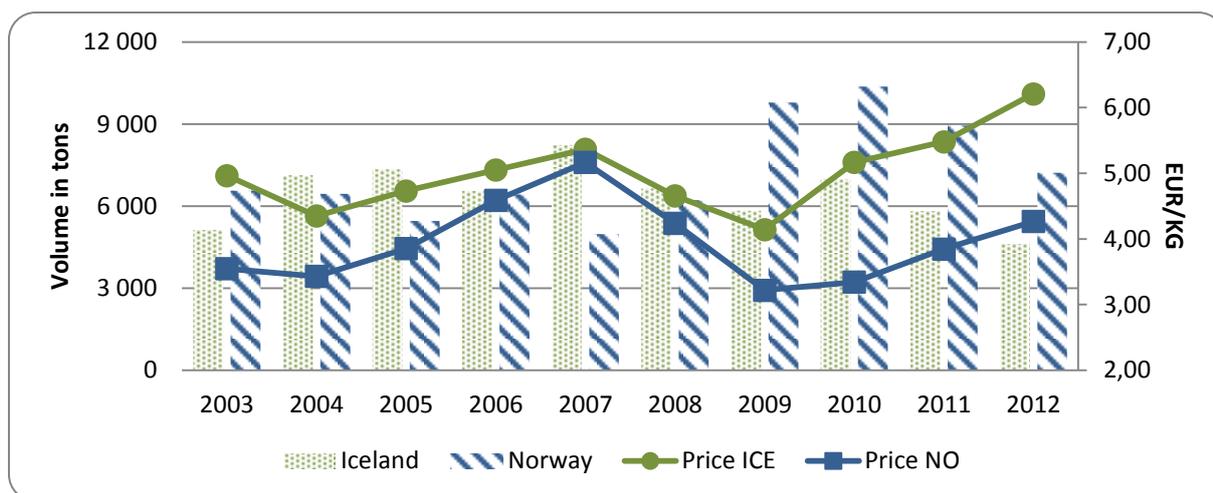
<i>Fresh Cod fillets</i>				<i>Frozen Cod fillets</i>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	9,29	1,27	****	Iceland	5,52	0,36	**
Norway	9,99	2,76		Norway	5,74	0,74	

\* P < 10 %, \*\* P < 5 %, \*\*\* P < 1 %, \*\*\*\* P < 0,1 %

Fig. 13, and 14 (next page) illustrate the yearly export volume and prices obtained for fresh and frozen haddock fillets for the two performance groups in the study period.



**Fig. 13.** The average prices and total volume of exported fresh haddock fillets from Iceland and Norway.  
Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 14.** The average prices and total volume of exported frozen haddock fillets from Iceland and Norway. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

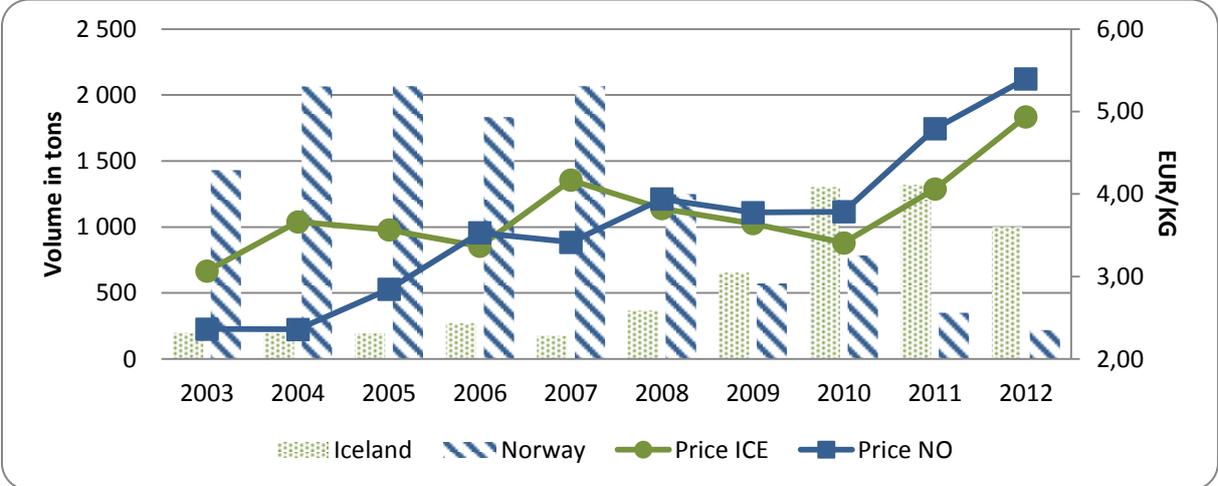
Fig. 13 and 14 reveal that the Icelandic whitefish fillet industry exported way more of fresh haddock fillets during the analyzing period. For frozen fillets, the Icelandic industry exported more of frozen haddock fillets between 2004 and 2008, but from 2009, the Norwegian industry began to export more of frozen haddock fillets than the Icelandic industry. The Icelandic industry obtained higher prices on average for the fresh haddock fillets except in 2008 and 2009. For frozen fillets, the Icelandic industry obtained higher prices on average than the Norwegian industry.

The single factor ANOVA analysis in Table 8 confirms that the Icelandic industry obtained higher prices for both fresh and frozen fillets during the study period with a significance level of less than 1 % for fresh haddock fillets, and with a significance level of less than 0.1 % for frozen haddock fillets

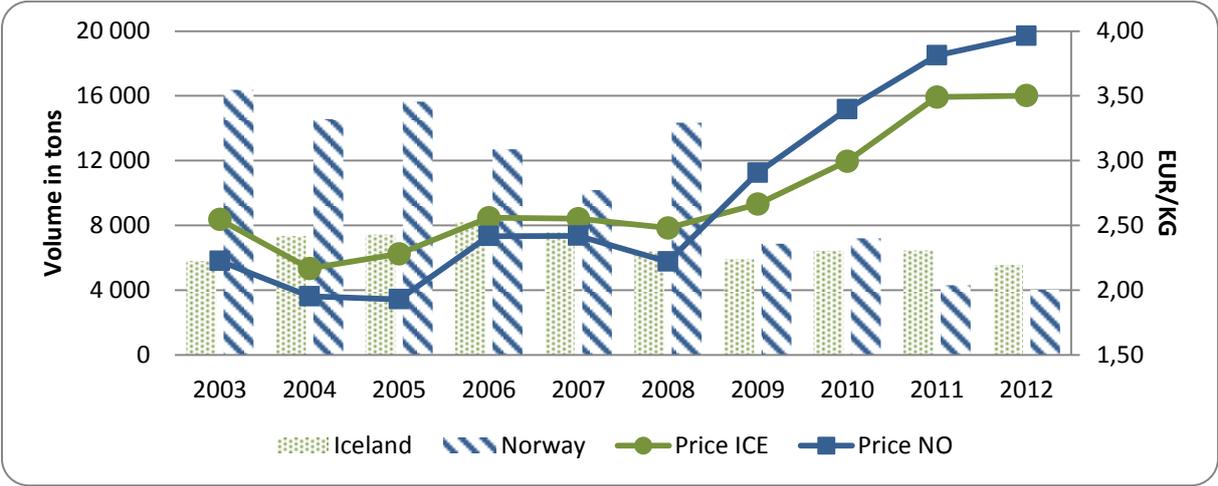
**Table 8.** The average prices between fresh and frozen haddock fillets in real terms. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

<i>Fresh Haddock fillets</i>				<i>Frozen Haddock fillets</i>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	7,46	0,87	***	Iceland	5,56	0,37	****
Norway	6,98	2,24		Norway	4,44	0,54	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			

Fig. 15, and 16 illustrate the yearly export volume and prices obtained for fresh and frozen saithe fillets for the two performance groups in the study period.



**Fig. 15.** The average prices and total volume of exported fresh saithe fillets from Iceland and Norway. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 16.** The average prices and total volume of exported frozen saithe fillets from Iceland and Norway. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

Fig. 15 and 16 reveal that the Norwegian industry exported a lot more of fresh saithe fillets than the Icelandic industry until 2007 when the export of fresh saithe fillets started to decline. Moreover, from 2009 the Icelandic industry was exporting more of fresh saithe fillets than the Norwegian industry. For frozen fillets, the Norwegian industry exported way more of frozen saithe fillets up until 2009 when the export of frozen saithe fillets began to decline, and in 2011 and 2012, the Icelandic Industry exported more of frozen saithe fillets than the Norwegian industry. The Icelandic industry obtained higher prices on average for the fresh saithe fillets in the period between 2003 and 2007 except from the years 2006, but since 2008, the Norwegian Industry has obtained higher prices on average for fresh saithe fillets. The

Icelandic industry did manage to obtain higher prices for the frozen fillets in the period between 2003 and 2008, but since 2009, the Norwegian industry has obtained higher prices on average.

A single factor ANOVA analysis in Table 9 confirms that the Icelandic industry obtained higher prices for fresh saithe fillets during the analyzing period with a significance level of less than 5 %. The Norwegian industry obtained slightly higher prices for frozen saithe fillets but that difference was not significant.

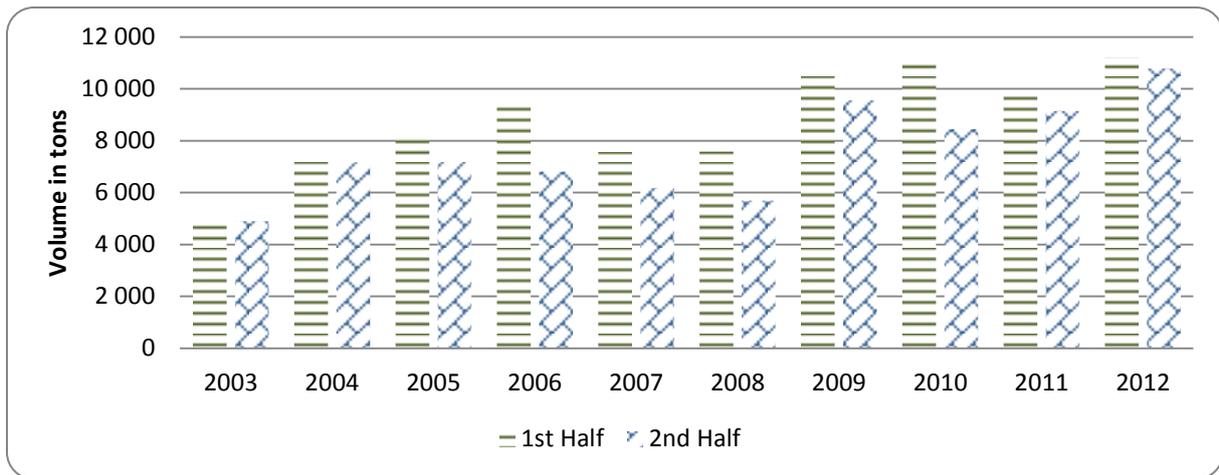
**Table 9.** The average prices of fresh and frozen saithe fillets in real terms.  
Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

<i>Fresh Saithe fillets</i>				<i>Frozen Saithe fillets</i>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	4,33	0,51	**	Iceland	3,01	0,14	-
Norway	4,05	0,90		Norway	3,05	0,46	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			

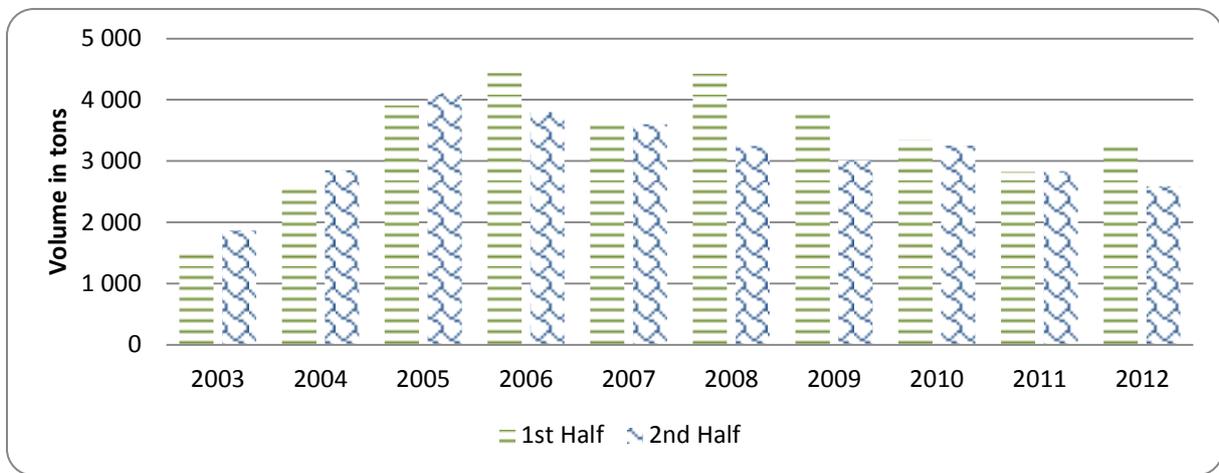
Based on the results presented in Figs. 11-16 and in Tables 7-9, I find it reasonable to accept Hypothesis 4a. The best performance group sells relatively more of fresh products than frozen. The Icelandic industry export way more of fresh cod fillets (see Fig. 11) and fresh haddock fillets (see Fig. 13) compared to the Norwegian industry, and from 2009 even more of fresh saithe fillets (see Fig. 15) despite a much lower catch (see Fig. 7).

**Hypothesis 4b:** *The best performance group sells more of fresh fillets in the second half of the year when the supply is limited and the prices are higher.*

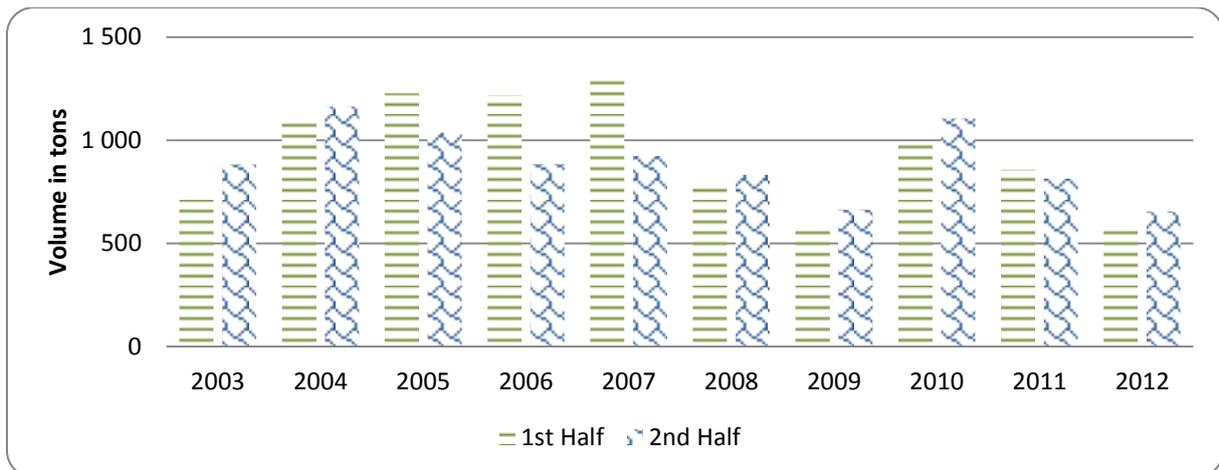
Hypothesis 4b states that in the second half of the year, there is less of fresh whitefish fillets exported than in the first half of the year due to seasonal variations and that the limited supply pushes up prices on fresh whitefish fillets in the second half of the year. However, before the results for Hypothesis 4b is revealed, I must first account for if the statements about that limited fresh fish supply in the second half of the year holds true. Fig. 17, 18, and 19 below show how much both the Icelandic and the Norwegian industry exported of whitefish fillets together in the first half and the second half of the year, respectively.



**Fig. 17.** Aggregated export from Iceland and Norway of fresh cod fillets in first and second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 18.** Aggregated export from Iceland and Norway of fresh haddock fillets in first and second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 19.** Aggregated export from Iceland and Norway of fresh saithe fillets in first and second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

Figure 17 shows that the export of fresh cod fillets is always lower in second half of the year except in 2003 when the export was 28 tons higher in the first half. However, the export of both fresh haddock and saithe fillets in first half compared to the second half varies throughout the period as can be seen in Fig. 18 and 19.

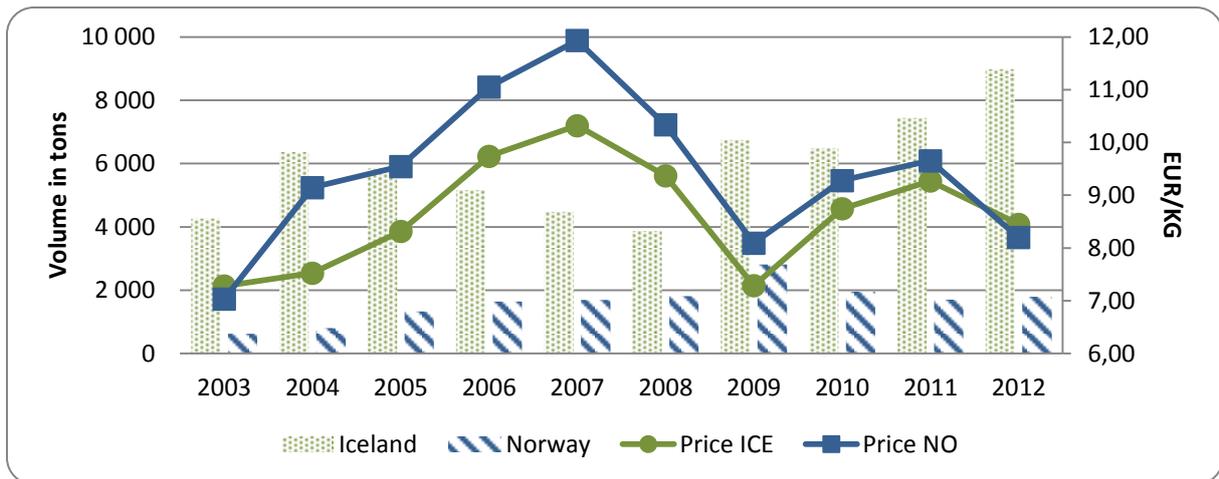
Table 10 below shows the differences in prices the Icelandic and the Norwegian industry obtained for their export of fresh whitefish fillets in the first and the second half of the year in real terms.

**Table 10.** The average prices for whitefish fillets in first and second half of the year in real terms.  
Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

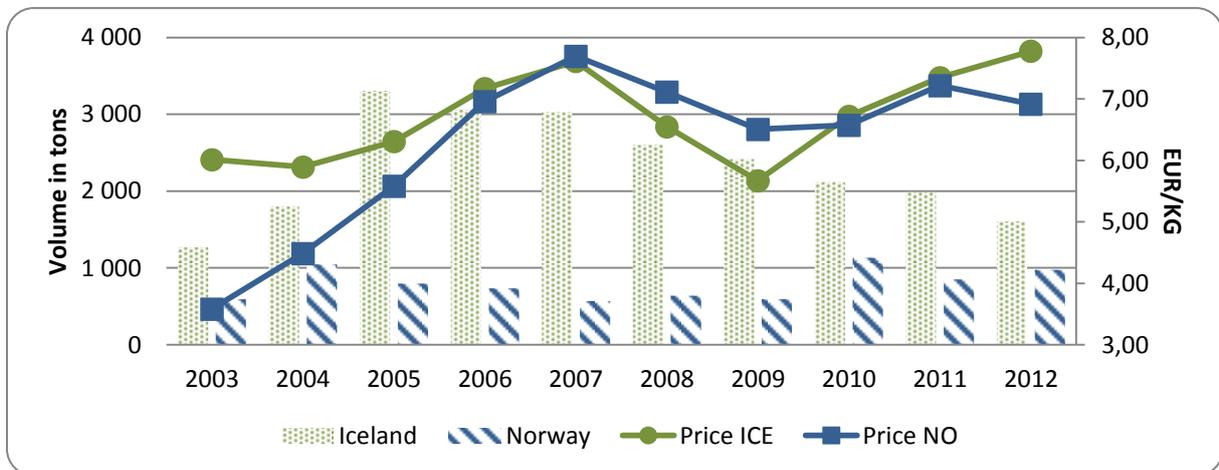
<b>Fresh Cod fillets</b>				<b>Fresh Cod fillets</b>			
<i>Iceland</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Norway</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
1st half	9,05	1,13	**	1st half	9,46	1,78	****
2nd Half	9,52	1,31		2nd Half	10,52	3,21	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			
<b>Fresh Haddock fillets</b>				<b>Fresh Haddock fillets</b>			
<i>Iceland</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Norway</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
1st half	7,41	0,95	-	1st half	6,89	2,02	-
2nd Half	7,51	0,80		2nd Half	7,08	2,48	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			
<b>Fresh Saithe fillets</b>				<b>Fresh Saithe fillets</b>			
<i>Iceland</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>	<i>Norway</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
1st half	4,23	0,59	-	1st half	3,94	1,01	-
2nd Half	4,42	0,42		2nd Half	4,15	0,78	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %				* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			

The table shows that both the Icelandic and the Norwegian industry obtain higher prices in the second half of the year. A single factor ANOVA test confirms that the price differences between the first and the second half of the year are significant in both Iceland and Norway for fresh cod fillets with a significance level of less than 5 % for Iceland and less than 0,1 % in Norway. The price differences between fresh haddock and saithe fillets are not significant in either Iceland or Norway.

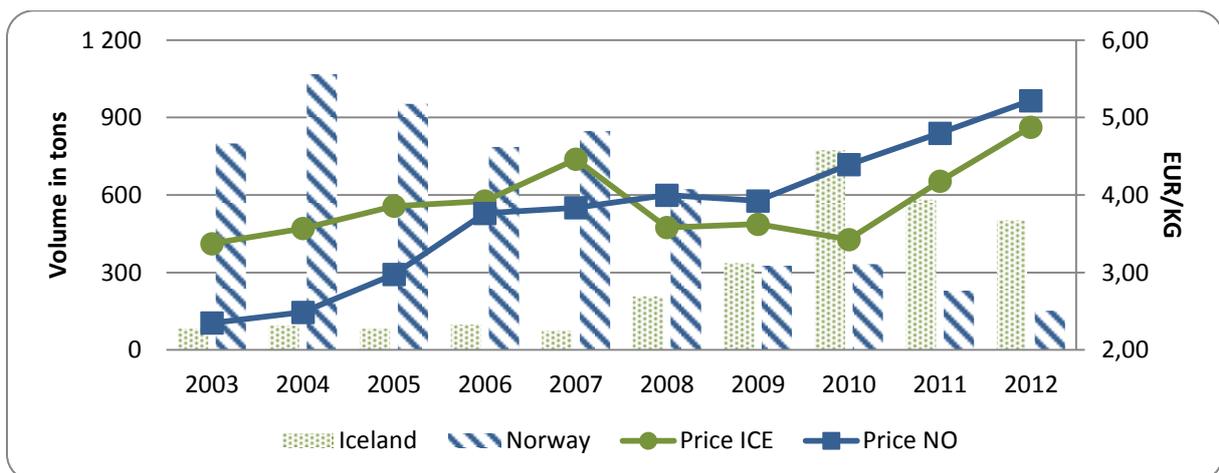
To summarize, it is only export and the price of fresh cod fillets that meet the significance criteria of hypothesis 4b. Fig. 20, 21, and 22 (next page) however, reveal which industry is exporting more of fresh whitefish fillets to the market and what prices they are achieving for their export.



**Fig. 20.** The average price and the total volume of fresh cod fillets exported from Iceland and Norway in the second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 21.** The average price and the total volume of fresh haddock fillets exported from Iceland and Norway in the second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.



**Fig. 22.** The average price and the total volume of fresh saithe fillets exported from Iceland and Norway in the second half of the year. Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

These figures show that the Icelandic industry exported more of both fresh cod and fresh haddock fillets in the second half of the year during the study period. However, the Norwegian industry exported more of fresh saithe fillets from 2003 to 2008 or until the Icelandic industry went past the Norwegian industry in 2009 and exported more of fresh saithe fillets. The Norwegian industry obtained higher average prices for fresh cod fillets in the second half of the year during the period except in 2003 and 2012. The Icelandic industry obtained higher average prices for fresh haddock fillets in the second half of the year during the period except between 2007 and 2009. Moreover, the Icelandic industry obtained higher average prices for fresh saithe fillets in the second half of the year in the period between 2003 and 2007. In the period between 2008 and 2012, the Norwegian industry obtained higher average prices.

A single factor ANOVA analysis to confirm if the price differences the Icelandic and the Norwegian industry managed to obtain for the fresh whitefish fillets can be seen in Table 11 below.

**Table 11.** The average prices for whitefish fillets in the first and second half of the year in real terms.

Sources: Norway Seafood Council and Federation of Icelandic Fish Processing Plants.

<b>Fresh Cod fillets 2nd half</b>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	9,52	1,31	****
Norway	10,52	3,21	
<b>Fresh Haddock fillets 2nd half</b>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	7,51	0,80	*
Norway	7,08	2,48	
<b>Fresh Saithe fillets 2nd half</b>			
<i>Industry</i>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	4,42	0,42	*
Norway	4,15	0,77	
* P < 10 %, ** P < 5 %, *** P < 1 %, **** P < 0,1 %			

Table 11 shows that Norwegian industry obtained higher average prices for fresh cod fillets in the second half of the year with a significance level of less than 0.1 %. However, the Icelandic industry obtained higher average prices on average for both fresh haddock and fresh saithe fillets in the second half of the year with a significance level of less than 10 %.

Based on the results presented in Figs. 17-22 and in Tables 10 and 11, I find it reasonable to accept Hypothesis 4b. The best performance group sells more of fresh fillets in the second half of the year when the supply is limited and the prices are higher. The Icelandic industry

exported more of both fresh cod (see Fig. 20) and fresh haddock fillets (see Fig. 21) in the second half of the year during the study period. From 2009, the Icelandic industry exported even more of fresh saithe fillets than the Norwegian industry in the second half of the year (see Fig. 22).

**Hypothesis 5:** *The best performance group acquires more whitefish which is caught by hooking gears.*

To be able to sell differentiated high quality fresh fillets to their customers, I expect the best performance group to acquire relatively more wet whitefish caught on hooking gear. Table 12 below illustrates the catch divided by fishing gears for the two performance groups during the study period.

**Table 12.** Catch of whitefish divided by fishing gears for Iceland and Norway  
Source: Statistic Iceland and Directorate of fisheries Norway.

	<i>Iceland</i>		<i>Norway</i>	
<i>Cod</i>	MEAN	SD	MEAN	SD
Trawl	44,7 %	1,5 %	31,4 %	1,3 %
Gillnet	12,6 %	3,3 %	28,7 %	1,8 %
Hand and Long line	36,1 %	3,1 %	23,1 %	1,2 %
Danish seine	5,4 %	0,6 %	16,7 %	0,5 %
Other	1,1 %	0,5 %	0,1 %	0,0 %
<i>Haddock</i>	MEAN	SD	MEAN	SD
Trawl	51,2 %	5,7 %	46,7 %	7,5 %
Long line	34,0 %	4,4 %	34,5 %	4,2 %
Danish seine	13,0 %	3,1 %	14,7 %	3,5 %
Other	1,8 %	0,8 %	4,1 %	1,7 %
<i>Saithe</i>	MEAN	SD	MEAN	SD
Trawl	84,0 %	4,4 %	51,8 %	4,8 %
Purse seine	(< 0,1%)	(< 0,1%)	23,2 %	4,3 %
Gillnet	7,0 %	3,4 %	17,0 %	2,9 %
Hand and Long line	6,2 %	1,7 %	4,4 %	0,8 %
Other	2,8 %	0,8 %	3,6 %	0,7 %

Table 12 shows the mean distribution of the main fishing gears employed to catch whitefish in Iceland (2003-2012) and Norway (2005-2012) on fish industry level on yearly basis during the study period. Trawl, hand- and long line are used in much higher scale in Iceland to catch cod than in Norway while gillnet and Danish seine are used in much higher scale in Norway compared to Iceland. For haddock catching, the main fishing gears seem to be used in a similar scale in both Iceland and Norway. For saithe catching, trawl is used as the main

fishing gear in Iceland while in Norway the gears are more divided between trawl, gillnet and even purse seine.

Supply of wet whitefish to the whitefish fillet processing industry in both Iceland and Norway on a monthly basis can be seen in Table 13 for cod, Table 14 for haddock and Table 15 for saithe. It should be noted that these numbers are based on firm level data for Norway, but on industry level data for Iceland.

**Table 13.** Mean distribution of main fishing gears employed to catch cod that is delivered fresh onshore.

Source: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

	<i>Hand and long line</i>		<i>Trawl</i>		<i>Gillnet</i>		<i>Danish seine</i>		<i>Other</i>	
	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway
Jan	50,6 %	25,8 %	28,2 %	54,7 %	16,8 %	8,3 %	4,2 %	11,2 %	0,1 %	0,0 %
Feb	43,2 %	23,7 %	22,8 %	27,8 %	28,6 %	13,5 %	5,3 %	35,0 %	0,1 %	0,0 %
Mar	29,4 %	20,1 %	20,3 %	17,1 %	41,0 %	23,6 %	8,6 %	39,2 %	0,7 %	0,0 %
Apr	35,8 %	28,8 %	27,9 %	20,1 %	26,5 %	16,9 %	7,8 %	34,1 %	2,0 %	0,0 %
Mai	48,4 %	32,9 %	31,6 %	27,4 %	8,3 %	2,8 %	9,0 %	36,9 %	2,7 %	0,0 %
Jun	54,4 %	24,1 %	33,2 %	56,9 %	2,0 %	0,2 %	7,5 %	18,8 %	2,8 %	0,0 %
Jul	61,2 %	21,6 %	25,9 %	70,9 %	3,0 %	0,2 %	6,7 %	7,3 %	3,2 %	0,0 %
Aug	57,1 %	9,9 %	30,2 %	75,5 %	4,4 %	1,7 %	6,4 %	12,9 %	2,0 %	0,0 %
Sep	50,3 %	11,0 %	36,5 %	73,1 %	3,8 %	3,5 %	8,0 %	12,2 %	1,5 %	0,1 %
Okt	54,1 %	15,5 %	36,2 %	73,7 %	3,6 %	3,7 %	5,3 %	6,9 %	0,8 %	0,1 %
Nov	54,6 %	29,3 %	34,0 %	63,6 %	5,6 %	2,2 %	5,3 %	4,8 %	0,5 %	0,0 %
Des	53,3 %	38,1 %	34,6 %	53,1 %	8,1 %	3,8 %	3,6 %	5,0 %	0,3 %	0,0 %

Table 13 shows the mean distribution of main fishing gears employed to catch cod that is delivered fresh onshore throughout the year during the analyzing period. As can be seen from the table, the Icelandic industry was producing more cod fillets from wet cod that was caught by hooking gears and gillnet compared to the Norwegian industry. The Norwegian industry on the other hand was producing more cod fillets from wet cod that was caught by other netting gears like Trawl and Danish Seine.

**Table 14.** Mean distribution of main fishing gears employed to catch haddock that is delivered fresh onshore.  
Source: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

	<i>Long line</i>		<i>Trawl</i>		<i>Danish seine</i>		<i>Other</i>	
	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway
Jan	70,6 %	58,7 %	19,0 %	31,2 %	8,8 %	9,5 %	1,6 %	0,7 %
Feb	54,6 %	41,0 %	25,6 %	37,4 %	17,7 %	20,2 %	2,0 %	1,4 %
Mar	32,4 %	9,4 %	29,2 %	31,3 %	36,1 %	57,7 %	2,3 %	1,6 %
Apr	30,5 %	3,1 %	43,9 %	27,8 %	22,3 %	67,3 %	3,3 %	1,8 %
Mai	28,5 %	12,6 %	39,4 %	16,6 %	25,4 %	69,9 %	6,6 %	0,9 %
Jun	39,7 %	48,5 %	34,0 %	23,3 %	21,8 %	26,5 %	4,5 %	1,7 %
Jul	50,0 %	60,7 %	25,9 %	30,9 %	20,2 %	7,0 %	3,9 %	1,5 %
Aug	54,0 %	39,4 %	22,7 %	41,7 %	20,1 %	18,3 %	3,2 %	0,6 %
Sep	63,4 %	41,9 %	16,8 %	43,7 %	17,4 %	13,2 %	2,4 %	1,2 %
Okt	70,2 %	54,6 %	15,4 %	35,7 %	12,3 %	8,0 %	2,0 %	1,7 %
Nov	74,9 %	70,7 %	14,6 %	23,8 %	8,8 %	4,5 %	1,6 %	1,1 %
Des	78,3 %	73,3 %	14,2 %	20,7 %	6,1 %	5,5 %	1,4 %	0,6 %

Table 14 shows the mean distribution of main fishing gears employed to catch haddock that is delivered fresh onshore throughout the year during the study period. As can be seen from the table, the Icelandic industry was producing more haddock fillets from raw material that was caught by hooking gears or in this case by long line than the Norwegian industry. The Norwegian industry was producing more haddock fillets from haddock that was caught by trawl and Danish seine.

**Table 15.** Mean distribution of main fishing gears employed to catch saithe that is delivered fresh onshore.  
Source: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

	<i>Hand and long line</i>		<i>Trawl</i>		<i>Gillnet</i>		<i>Purse seine</i>		<i>Other</i>	
	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway	Iceland	Norway
Jan	4,9 %	6,6 %	65,6 %	32,8 %	23,0 %	7,6 %	(< 0,1 %)	31,0 %	6,5 %	22,1 %
Feb	4,2 %	1,9 %	59,6 %	63,0 %	29,2 %	3,9 %	(< 0,1 %)	12,2 %	7,0 %	19,0 %
Mar	3,5 %	1,5 %	62,9 %	57,7 %	26,6 %	4,8 %	(< 0,1 %)	10,4 %	7,0 %	25,5 %
Apr	5,8 %	2,3 %	81,6 %	28,6 %	7,4 %	2,7 %	(< 0,1 %)	50,0 %	5,2 %	16,4 %
Mai	16,6 %	2,6 %	72,4 %	22,1 %	4,1 %	0,4 %	(< 0,1 %)	64,9 %	6,9 %	10,0 %
Jun	28,3 %	7,1 %	62,8 %	25,5 %	2,7 %	0,4 %	(< 0,1 %)	58,5 %	6,2 %	8,5 %
Jul	30,8 %	8,6 %	61,9 %	29,4 %	2,6 %	1,3 %	(< 0,1 %)	56,0 %	4,7 %	4,8 %
Aug	27,3 %	8,8 %	63,0 %	41,2 %	5,3 %	9,1 %	(< 0,1 %)	27,1 %	4,4 %	13,8 %
Sep	7,4 %	5,3 %	82,6 %	41,7 %	6,5 %	12,8 %	(< 0,1 %)	15,1 %	3,6 %	25,2 %
Okt	4,0 %	4,3 %	77,7 %	31,4 %	14,9 %	18,7 %	(< 0,1 %)	16,6 %	3,3 %	29,0 %
Nov	3,0 %	3,2 %	69,3 %	22,8 %	25,0 %	17,8 %	(< 0,1 %)	12,5 %	2,7 %	43,7 %
Des	3,8 %	6,4 %	68,1 %	22,7 %	25,4 %	19,8 %	(< 0,1 %)	12,2 %	2,7 %	38,9 %

Table 15 shows the mean distribution of main fishing gears employed to catch saithe that is delivered fresh onshore throughout the year during the study period. As can be seen in the table, the Icelandic industry was producing or was able to produce more saithe fillets from wet saithe that was caught by trawl and gillnet, and that was caught by hooking gears during the summer months than the Norwegian industry. The Norwegian industry on the other hand was producing more saithe fillets from wet saithe that was caught by Purse seine and Danish

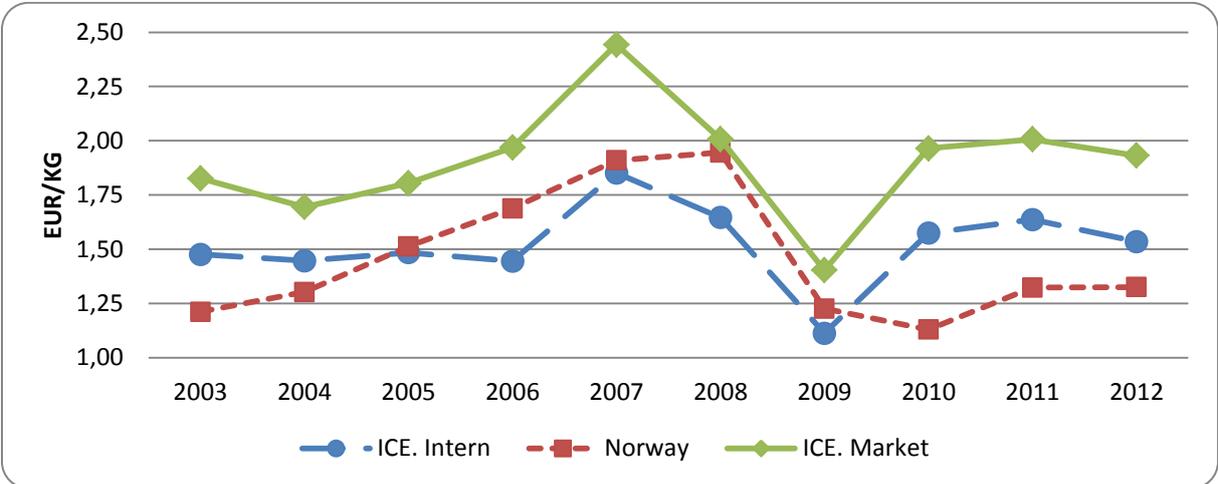
seine which is included in “other”.

Based on the results presented in Tables 12-15, I find it reasonable to partially accept Hypothesis 5. The best performance group acquires more whitefish which is caught by hooking gears. Hand- and long line are used in much higher scale in Iceland to catch cod, the most valuable species, than in Norway (see table 12 and 13). When it comes to haddock and saithe, the differences are minor.

**Hypothesis 6:** *The best performance group pays less for raw materials at first hand than does the other performance group.*

For the whitefish fillet industry, low raw material cost is essential for achieving a profitable production. Fig. 23, 24 and 35 show the price pattern of raw material for the three main whitefish species for the two performance groups.

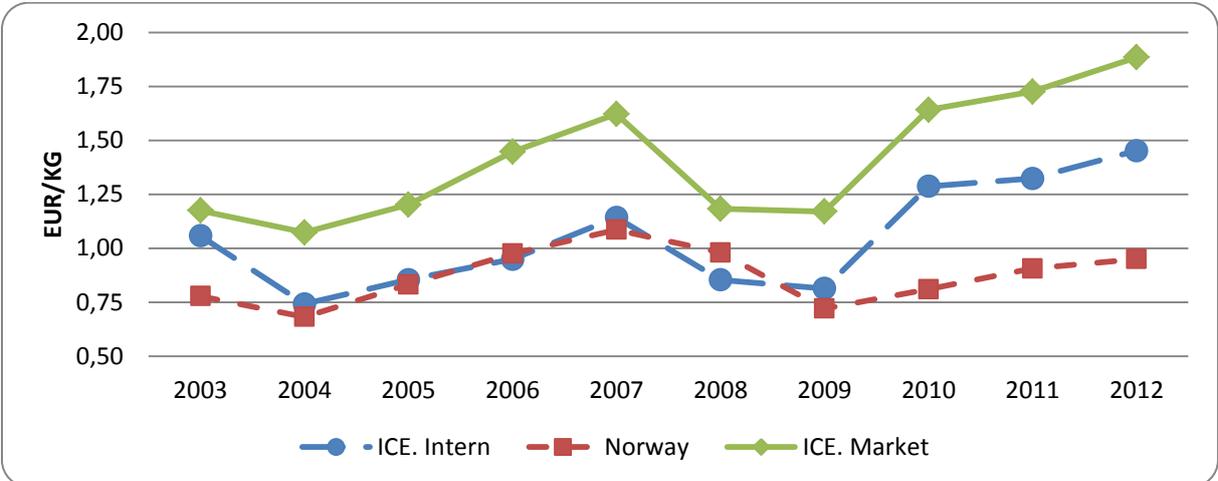
Fig. 23 shows the average nominal price for wet cod on a yearly basis during the analyzing period.



**Fig. 23.** The average price for fresh cod, all fishing gears. Sources: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

The figure shows that the Norwegian industry paid the lowest price in the beginning of the study period. In the period between 2005 and 2009, the vertically integrated firms in Iceland that can engage in direct trade, paid the lowest price on average. But from 2010 to 2012 the Norwegian industry paid the lowest price for fresh cod on average again. In Iceland, about 23 % of all fresh cod was traded in fish markets during the study period (SD 1 %). In the period covered, the auctions in Iceland were the most expensive supplier of wet cod.

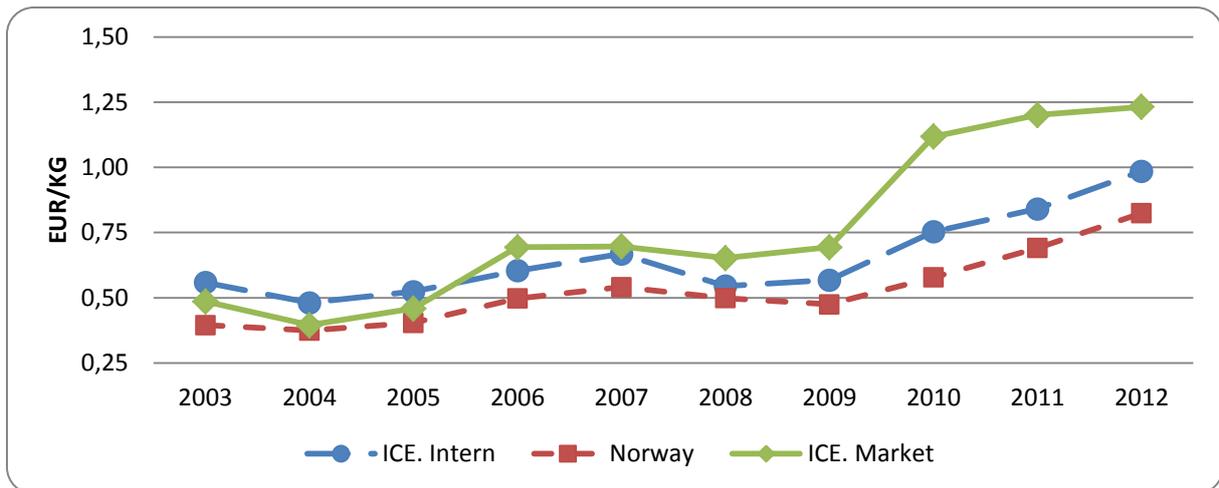
Fig. 24 shows the average nominal price for wet haddock on a yearly basis during the analyzing period.



**Fig. 24.** The average price for fresh haddock, all fishing gears. Sources: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

The figure shows that the Norwegian industry always paid the lowest price for fresh haddock on average except in 2006 and 2008 when the vertically integrated firms in Iceland paid the lowest price. The fish market in Iceland, where on average about 53 % of all fresh haddock in Iceland were traded during the analyzing period (SD 5 %), is always more expensive than directly traded haddock within the vertically integrated firms or for the plants in Norway.

Fig. 25 (next page) shows the average nominal price for wet saithe on a yearly basis during the analyzing period.



**Fig. 25.** The average price for fresh saithe, all fishing gears. Sources: Nofima Norway and The Directorate of Fresh Fish Prices Iceland.

The figure shows that the Norwegian industry always paid the lowest price for wet saithe on average during the analyzing period. Another interesting thing is that the fish market in Iceland, where on average about 21 % of all wet saithe were traded during the analyzing period (SD 4,6 %), was cheaper than the price the vertically integrated firms in Iceland were paying for wet saithe between 2003 and 2005.

Since the prices that the Norwegian industry paid for the supply of wet whitefish is closer to the prices that the vertically integrated firms in Iceland paid in direct trades for their supply of wet whitefish, it is more reasonable to compare those prices with each other to find out if the average monthly prices during the study period can be a source of competitive advantage for either the Icelandic or the Norwegian industry. If there are significant differences between the prices in favor of Norway, then the Norwegian industry is definitely in favor.

Table 16 (next page) shows the average prices paid monthly for the wet whitefish species by the Norwegian industry and the vertically integrated firms in Iceland in real terms. The Norwegian industry paid on average during the analyzing period 1,62 euros for each kilo of cod purchased while the vertically integrated firms in Iceland paid on average 1,69 euros for each kilo of cod purchased in direct trades. The single factor ANOVA analysis of the price differences confirms that Norwegian industry pays less for their supply of wet cod each month with a significance level of less than 10 %.

**Table 16.** Comparing monthly prices for fresh whitefish between Norwegian industry and the vertically integrated firms in Iceland during the analyzing period. Prices in real terms.

Source: Nofima and Directorates of Fresh Fish Prices Iceland.

<b>Cod</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	1,69	0,0655	*
Norway	1,62	0,1104	
<b>Haddock</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	1,17	0,0666	****
Norway	0,97	0,0277	
<b>Saithe</b>	<i>Mean</i>	<i>Variance</i>	<i>Significance</i>
Iceland	0,72	0,0201	****
Norway	0,60	0,0175	

\* P < 10 %, \*\* P < 5 %, \*\*\* P < 1 %, P < 0,1 %

The Norwegian industry paid on average during the analyzing period 0,97 euros for each kilo of haddock purchased while the vertically integrated firms in Iceland paid on average 1.17 euros for each kilo of haddock purchased in direct trades. The single factor ANOVA analysis of the differences confirm that Norwegian industry pays less for their supply of wet haddock each month with a significance level of less than 0,1 %.

The Norwegian industry paid on average during the analyzing period 0,60 euros for each kilo of saithe purchased while the vertically integrated firms in Iceland paid on average 0,72 euros for each kilo of saithe purchased in direct trades. The single factor ANOVA analysis of the differences, confirms that Norway pays less for their supply of saithe each month with a significance level of less than 0,1 %.

Fig. 23, 24, and 25 and Table 16 shows that the best performance group paid a significant higher raw material prices for all three whitefish species in the analyzing period. Moreover, in Iceland the companies acquiring raw fish from fish auctions had to pay the highest price. Based on these results, I find it reasonable to reject Hypothesis 3 that the best performance group pays less for raw materials at first hand than the other performance group does.



## 5 Discussion

This thesis is motivated by a question of competitive advantage of nations which has received a lot of attention in strategy literature. Why do sustainable profitability differences occur among the same type of industries which are located in different countries? In this thesis, I have examined if the Norwegian and the Icelandic whitefish fillet industry that base their production on the same type of wild resource, namely whitefish, have different profitability since they both compete and sell most of their products to the same markets. On the basis of ten years of accounting data, I found that the Icelandic industry performed significantly better than the Norwegian industry on all four performance measures used (see Table 3). However, in the Icelandic sample, I recognized four different strategic groups (see Fig. 3), while in the Norwegian population, there was only strategic group. When comparing the Icelandic strategic group of specialized and not integrated firms with the corresponding Norwegian strategic groups, the performance difference found was significantly better only at operating level (see Table 3).

In this discussion section, I will consider what kind of national competitive advantages might exist in Iceland compared to Norway based on my findings and the theories of comparative advantages of competition (Hunt & Morgan, 1995), and competitive advantage of nations (Porter, 1990). If I find any sustainable advantages, the next step will be to discuss if they are duplicable.

### 5.1 Sustainable factor advantage: more access to whitefish resources

The first three hypotheses were built upon the factor conditions from Porter's Diamond (Porter, 1990) and the input element from the comparative advantages of competition (Hunt & Morgan, 1995). First, I examined if the best performance group had more access to whitefish on a yearly basis during the analyzing period. However, this turned out not to be the case. On the contrary, Norway the worst performer, caught more cod than Iceland every year during the whole timeframe, and considerably more the last three years than was the case for Iceland (see Fig. 5). For haddock the situation was different (see Fig. 6), but also when it came to this species, the Norwegian catches outperformed that of Iceland the last three years of the analyzing period. Norway had without a doubt a superb position when it came to catches of saithe (see Fig. 7). The country caught around three to four times more saithe yearly than Iceland did during the study period.

To conclude, Norway, the worst performer, had more access to whitefish raw material than Iceland for all three whitefish species during the analyzing period. For saithe, the advantage is substantial. The advantage may be rooted in better biological conditions, improved fishery management or a combination of these matters. Biological conditions are not duplicable, neither is fishery management – at least not in the short run. Therefore, I think Norway had a sustainable advantage over Iceland when it came to access of saithe. However, the Norwegian industry failed to convert better access of whitefish resources to improve the financial performance of the firms (see Table 3), mainly because much of the catches are frozen down on trawlers, landed and sold to competing industries abroad.

## **5.2 Sustainable factor advantage: better stability throughout the year of whitefish resources**

The second hypothesis stated that the best performance group had a more stable supply of raw material throughout the year. A more even supply of wet whitefish may lead to increased utilization of the production capacity, and enables firms to supply the market more continuously.

The monthly landing pattern of cod and saithe throughout each year deviated significantly less in Iceland from an optimal landing pattern than in Norway (see Table 4). For haddock, the difference was not significant. These results indicate that Iceland had an advantage when it came to supply of wet whitefish throughout the year, even though both nations pursue a seasonal based cod fishing during wintertime (Nilssen et al., 2014; Knútsson et al., 2011).

The affirmation of hypothesis 2, ascertain that the best performance group does have a national advantage when it came to having better supply condition for whitefish throughout the year, even though the supply of haddock was not confirmed being significant in favor of Iceland.

This advantage may also be rooted in biological conditions, or in improved fishery management. The migratory pattern of the different whitefish species is a biological factor which cannot be duplicated, indicating that this advantage is sustainable. If the landing pattern in Iceland is partly motivated by the Icelandic quota year starting on September 1st, then this is an administrative decision that can also be initiated in Norway. To conclude, I believe that

Iceland has a sustainable advantage over Norway when it comes to raw material stability throughout the year, and this advantage is hardly duplicable.

Moreover, the Icelandic industry managed to utilize the better access to whitefish resources throughout the year financially by selling more fresh cod fillets and haddock fillets in the second half of the year when the supply was limited and the prices were higher (see Fig. 20, and Fig. 21). From 2009, the Icelandic industry exported even more of fresh saithe fillets than the Norwegian industry in the second half of the year (see Fig. 22).

### **5.3 Sustainable factor advantage: a lower cost level**

The third hypothesis claimed that the best performance group is operating where the general cost level is lower. I expected that the best performance group is able to take an advantage of employing different input factors that are pivotal for production of whitefish fillets at lower cost and with that gain comparative advantage on the resource side.

Table 5 uncovered that the best performance group did not have a national cost advantage during the study period. The price level in Iceland was lower than the Norwegian price level in the beginning of the study period, and vice versa at the end of the period. When studying the relative cost levels for employing critical resources in the whitefish fillet industry, several interesting issues were revealed. The variable Cost of goods sold on Total turnover showed that the industry in Iceland is spending significantly less on raw material compared to the value they generate for their products than the Norwegian whitefish industry (see Table 6). This seems like a paradox based on the discussion where it was ascertained that the Norwegian industry is paying less for their supply of raw material (see Table 16). But when taking into account that the Norwegian firms do also process frozen whitefish products that obtain less value in the market, this result was less surprising. Moreover, when the Norwegian firms buy wet whitefish at first hand and export it unprocessed, they obtain even lower value on the market place than frozen whitefish fillet products (see table 2). Export of fresh unprocessed whitefish from the Icelandic whitefish fillet firms occur on an extremely low scale (Viðarsson & Margeirsson, 2010), which is an indication that the Icelandic whitefish processing firms process most of their raw material.

Labor cost on Total turnover showed that the industry in Iceland was spending less on wages/salaries compared to the value they generate for their products than the Norwegian whitefish fillet industry, though the result was not significant (see Table 6). This is in accordance with what was relatively known worldwide that labor costs in Norway are among the highest in the world. One reason for the modest difference in relative labor costs between the two performance groups may be that the Norwegian firms are exporting much more whole round fish than the Icelandic firms (see Table 2), an activity which is less labor intensive.

Other operating costs on Total turnover showed that the industry in Norway was spending significantly more on other factors that are important for their operations compared to the value they generate for their products. This was surprising, because a variable that is included in operating cost and have an opposite effect, was transportation costs.

Norway transport their whitefish products to the market with transportation vehicles (Egeness et al., 2011), while Iceland transport their fresh whitefish fillets to the markets by flights (Jónsdóttir, 2011). The disadvantage of transporting whitefish products with transportation vehicles from North of Norway is that it can take days for the products to get to the market, while it may just take few hours to transport the products by air from Iceland. However, to use transportation vehicles is cheaper than using flights (Asche & Tveterås, 2011). The advantage that the Norwegian industry has on this variable is that they are spending less money on transporting their products to the marketplace, while the Icelandic industry has the advantage of getting their products to the market more quickly than the Norwegian industry – an advantage that has a higher price tag.

Depreciation on Total turnover showed that the industry in Iceland was depreciating their fixed assets significantly more than the Norwegian industry. This could be due to the production in Iceland being automated to a greater extent than in Norway.

Financial costs on Total turnover showed that the industry in Norway was spending less on servicing their debts than the Icelandic industry (see Table 3). The main reason lies in the financial crisis that depreciated the Icelandic currency. All the firms that represent the Icelandic sample had loans in foreign currencies in order to lower their interest expenses. When the financial crisis hit Iceland, those loans increased in value due to exchange rate adjustments with the consequence that the financial costs for all the firms became

significantly higher in 2008 compared to the other years in the study period.

To summarize, when comparing price indices (Table 5), it was revealed that the best performance group did not have national cost advantage in the study period. Nevertheless, the Norwegian industry may have comparative advantage on the raw material side since they have more access to whitefish (see Fig. 5, 6 and 7), and it costs less to buy wet whitefish at first hand in Norway than in Iceland (see Table 16). The Icelandic industry was however able to turn their raw materials into more valuable products than the Norwegian industry (see Fig. 11 to 16). The Norwegian industry may also have a cost advantage when it comes to transportation costs mainly because of the vehicle alternative they have which the Icelandic industry does not have.

#### **5.4 Sustainable firm advantage: a differentiated marketing strategy**

The hypotheses related to firms' strategies build upon Porter's Diamond (Porter, 1990) and the output element as well as input element of raw material from the comparative advantages of competition (Hunt & Morgan, 1995). First, I anticipated that the best performance group was pursuing differentiation strategies by selling more of the best paid fresh product variants and thus creating superior values.

The Icelandic industry did export significantly more of fresh cod fillets than the Norwegian industry (see Fig. 11). Moreover, the results uncovered that the industries in both nations were trying to shift their production from frozen to fresh cod fillets. However, the Norwegian industry was not able to take advantage of their unique resource position when the access of cod increased dramatically from 2009 to 2012 because the growth did not result in more fresh (or frozen) fillet production. Nevertheless, the Norwegian industry did manage to obtain significantly higher prices for their export of both fresh and frozen cod fillets than Iceland (about 0,7 euros more for fresh cod fillets and 0,22 euros more for frozen cod fillets).

The Icelandic industry did also export significantly more of fresh haddock fillets than the Norwegian industry (see Fig. 13). The situation was similar here as for production of fresh cod fillets in Norway. The supply of haddock did increase dramatically in Norway in the period from 2009 to 2012, with an exact opposite development in Iceland. Nevertheless the Norwegian industry still did not sell more of fresh haddock fillets than Iceland (see Fig. 13) did with a much smaller resource base (see Fig. 6). The Icelandic industry obtained

significantly higher prices for their export of both fresh and frozen haddock fillets (see Table 8).

The Norwegian industry did export more of fresh saithe fillets than the Icelandic industry from 2003 to 2008, but that position turned in 2009 when Iceland began to export more of fresh saithe fillets than the Norwegians (see Fig. 15). Even though the Norwegian industry had much more access to fresh whole saithe than Iceland, they still lost their leading position when it came to exporting fresh saithe fillets. Moreover, the Icelandic industry obtained significantly higher prices for their export of fresh saithe fillets (see Table 9) than the Norwegian.

I expected that the best performance group was selling more of fresh fillets in the second half of the year when the supply was limited and prices were higher. The results revealed that the Icelandic industry did export significantly more fresh cod fillets in the second half (see Fig. 20). The Norwegian industry did however obtain significantly higher prices for their export of fresh cod fillets in the second half of each year, but not for haddock or saithe (see Table 11). Put together, the Icelandic whitefish fillet industry was pursuing a more differentiated marketing strategy than the Norwegian industry by focusing stronger on selling more fresh fillets, especially in the second half of the year when the supply was limited and the prices were higher.

The Icelandic differentiating strategy is sustainable as long as there is a substantial and even increasing demand for fresh whitefish fillet products from customers with high purchasing power (Henriksen & Sogn-Grundvåg, 2011; Henrikssen & Svorken, 2011; Heide & Henriksen, 2013). Such strategies will however, as will be discussed in the next sections, require supporting procurement strategies which emphasize acquiring raw materials of high quality, and maybe also a more market-oriented firm structure as exemplified by three out of the four strategic groups in Iceland (see Fig. 3). As will be discussed in the following sections, for the Norwegian industry to duplicate the Icelandic industry that I consider being more market-oriented, this will require several fundamental political, administrative, and managerial actions.

## **5.5 Sustainable firm advantage: a quality focused procurement strategy**

Whitefish caught by hooking gears is considered to be of higher quality than whitefish caught by netting gears (Akse et al., 2013; Heide & Henriksen, 2013), so the group that can acquire more hooking gear caught whitefish is expected to have an advantage when it comes to quality of the raw material. This would also be a precondition for pursuing a differentiated marketing strategy based upon fresh quality fillets. Nilsen et al. (2014) found that the best performing Norwegian firms purchased more wet whitefish caught by hooking gears than firms that performed poorly.

The results uncovered that hooking gears were used in a bigger scale to harvest cod in Iceland compared to Norway (see Table 12). Moreover, the mean monthly distribution of fresh delivered whitefish disclosed that the Icelandic industry had much more access to cod that was caught by hooking gears than the Norwegian industry throughout the year (see Table 13).

The Norwegian industry did buy more of wet cod that was caught by Danish seine in the first half of the year when there was high season for cod fishing in Norway, while they purchased wet cod that was caught by trawl in the second half of the year (see Table 13).

The Icelandic industry did also have more and stable access to haddock that was caught by long line than the Norwegian industry, but they bought much of their haddock supply that was caught by long line in the second half of the year. Both industries did mostly have access to saithe that was caught by different kind of netting gears (see Table 12).

The Icelandic whitefish fillet firms, seems to pursue procurement strategies applying hooking gears to a bigger extent than the Norwegian firms, thus supporting differentiated marketing strategies. The procurement strategy and the differentiating strategy seems to be constructively aligned also by the Norwegian industry, in that a low price marketing strategy (exporting way more round whole frozen fish than Iceland, see table 2) was aligned with procurement strategy mainly based on the use of netting gears (see table 12) which is a cheap catching method, with a downside that the quality of the landings are poor (Akse et al., 2013; Heide & Henriksen, 2013).

To sum up, the Icelandic industry seems to have a sustainable advantage when it came to procurement strategies, but the study of Nilsen & al. (2014) disclosed that the best Norwegian firms increasingly purchased more raw materials from hooking gears. Here, this procurement strategy may be duplicable.

## **5.6 Sustainable firm advantage: lower raw material prices**

I expected that the best performance group pays less for wet whitefish at first hand. Since many of the whitefish fillet firms in Iceland are vertically integrated and are engaged in direct trades of raw material from their own vessels to their own processing plants without competing for the raw material on the market (Knútsson et al., 2008; Knútsson et al., 2011), I would expect such transactions would lead to lower prices of raw material than was the case in Norway where such trades do not take place due to another institutional framework (The raw fish act of 1951, now “fiskesalgslagslova av 2013”). Moreover, I would expect that the market price for raw material in Iceland was closer to the prices that the Norwegian firms were paying at first hand.

However, the results disclosed that the annual market prices in Iceland was always higher than the annual prices the Norwegian whitefish fillet firms were paying for cod at first hand, and from 2010 the annual prices became way higher (see fig. 23). I therefore found it reasonable to indicate that the Norwegian whitefish fillet industry had an advantage over the non-vertically integrated firms in Iceland since the Norwegian firms did pay less for their supply of wet cod.

The results also showed that the annual direct trade prices paid by the vertically integrated firms in Iceland were only lower than the annual prices the Norwegian whitefish fillet firms did pay at first hand in the period between 2005 and 2009 (see fig. 23). This is rather interesting since I would expect that the whitefish fillet industry that is engaged in direct trades would on average pay lower prices for the supply of wet cod than the Norwegian whitefish fillet industry that has to buy wet cod from the a market.

The results confirmed that the Norwegian whitefish fillet industry did pay significantly lower prices for their supply of wet cod than the vertically integrated firms in Iceland were paying (see table 16). For fresh whole haddock (see fig. 24) a similar pattern as for wet cod was

revealed. Wet saithe was always cheaper to purchase for the Norwegian industry (see fig. 25).

The results confirm that the best performance group did not have a national advantage when it came to paying lower prices for the supply of raw material. Instead it was the Norwegian whitefish fillet industry that had an advantage over Iceland even though most of the Icelandic whitefish fillet firms are engaged in direct trades.

It should be noted that the annual prices (see Fig. 23, 24, and 25) were based on the average prices of fresh landed catches from all fishing gears combined, and did therefore not take into account that some gears are employed in greater scale in Iceland than in Norway, and that the quality and prices of the raw materials should be thereafter (Heide & Henriksen, 2013; Akse et al., 2013).

To sum up, the average prices of the most conventional fishing gears used in both countries during the study period was lower in Norway for all gears except for the average price of cod caught by long line. There may be several explanations for this. The smaller supply of whitefish raw material in Iceland than Norway, can contribute to push up prices. Moreover, selling fresh whitefish fillet to consumers at higher prices may cause prices of raw material to be pulled up in Iceland. Finally, the pricing of raw material in Iceland may be more market-based through the use of fish auctions than is the case in Norway.

The Norwegian industry had a sustainable advantage when it came to raw material prices compared to Iceland during the study period. However, if this advantage was mainly due to the Norwegians catching low quality raw material cheaply by netting gears and exporting whole round frozen fish at lower prices, this low-cost/low-price strategy may have contributed to the Norwegian industry being the underperformer in the study period. I think such “advantage” is duplicable for the Icelandic industry, but it is not recommended that the Icelandic industry should duplicate it.



## 6 Conclusion

This dissertation was motivated by the question why an industry in a certain nation is more profitable than the same industry in another nation (Porter, 1990). The empirical context I chose was the whitefish fillet industry in Iceland and Norway. The industries in both nations are based on land based processing plants using the same type of natural resources; namely cod, haddock and saithe. Moreover, they export the majority of their products to the same markets abroad. The research questions were:

*“Does the Icelandic whitefish fillet industry have competitive advantages over the Norwegian whitefish fillet industry, which makes the Icelandic industry more profitable than the Norwegian industry? If so, what are those advantages and are they duplicable?”*

First, I examined if the whitefish fillet industry in Iceland was more profitable than the same industry in Norway. Possible profit differences could indicate that the industry in one nation had gained competitive advantages over the industry in the other nation.

On the basis of accounting data for ten consecutive years (2003-2012) from firms in both nations, I concluded that the whitefish fillet industry in Iceland was more profitable than the corresponding Norwegian industry. It should, however, be noted that in the Icelandic sample, four distinct strategic groups were identified (see Fig. 3), whereas there was only one strategic group in the Norwegian population. Therefore, the structures of the firms that produce whitefish fillet products in Iceland were more complex than was the case for the whitefish fillet firms in Norway.

The financial results disclosed that the more complex the structure of the Icelandic firms, the more profitable they became compared to the Norwegian firms (see Table 3). However, when the profitability measures of the specialized strategic group in both nations were compared, the profitability differences were less pronounced, and only significant at a 10 % level for the operational measure EBITDA/Total Asset. This implies that the improved profitability of the Icelandic industry was mainly due to healthier profitability of the three strategic groups (vertically integrated-, vertically integrated and diversified-, and global strategic group) that were not present in the Norwegian population.

Three working hypotheses related to factor conditions, and another three related to firm strategies were constructed on the basis of the theoretical framework building on Porter's Diamond (1990) and the theory of comparative advantages of Hunt and Morgan (1995), to shed lights on what kind of advantages the best performance group (Iceland) might have, and if those advantages could be duplicated by the Norwegian industry.

The Icelandic firms had a biological disadvantage when it came to accessibility of whitefish supplies, therefore the Icelandic firms could not reap the benefits of scale economies. The disadvantage is sustainable as it is partly rooted in biological conditions.

This disadvantage was however turned into a significant advantage when it came to the landing pattern of the catches throughout the year, except for haddock. With more stable supply condition, the foundation may have been laid for better capacity utilization which in turn could pave the way for a more profitable production by the Icelandic firms. Since this advantage at least partly is rooted in the biological conditions (the migration pattern of the species), it is not duplicable for the Norwegian Industry.

The Icelandic firms seemed to be more market-oriented than the Norwegian firms since they to a greater extent were pursuing a differentiated marketing strategies that involved processing and selling more of fresh whitefish fillets even though the accessibility of whitefish was poorer in Iceland than in Norway. However, the supply conditions throughout the year facilitated a more stable production enabling them to supply the market on a more continuous basis. The firms in Iceland did also have procurement strategies of acquiring whitefish of high quality caught by hooking gears, especially for cod and haddock, supporting their differentiated marketing strategies.

To summarize, in the Icelandic industry, it appears that the firms differentiated marketing strategies, procurement strategies, and the firm structures are better constructively aligned aiming to maximize the profit throughout the whole value chain of the industry. The Icelandic firms' more complex structures are supported by an institutional framework, which has allowed the industry to integrate vertically to secure the raw material supply, and diversifying to reduce the operational risk by only being engaged in reaping demersal species.

In the following, I will discuss possible implications of my findings; managerial, administrative and political.

## **6.1 Managerial implications**

The findings that the Icelandic firms have implemented strategies to process and export more fresh whitefish fillets from less catch volumes than the Norwegian firms indicates that it can make sense to pursue a differentiated marketing strategy that involves more production of fresh whitefish fillets, and to reduce the export of fresh and frozen unprocessed whitefish. The Achilles heel is obviously the big focus on cod products, which is the best paid product variant but also because the access of fresh cod throughout the year is unfavorable for the Norwegian industry.

A bigger focus on fresh haddock and saithe fillets processing during times when cod supplies are scarce could therefore be wise in order to create more diversified product strategies and to keep processing plans operating continuously throughout the year. These products may have been considered third class products especially during the early years of the analyzing period. The prices the Norwegian industry obtained for fresh haddock and saithe fillets were much lower than the prices of similar products from Iceland. However, the prices the Norwegian industry has obtained in recent years are more alike the prices the Icelandic industry were obtaining for fresh haddock fillets and higher for fresh saithe fillets. Still it seems that the Norwegian industry has not yet managed to take advantage of this resulting in even more plants being forced to close down.

The findings do also show that the Icelandic firms are implementing procurement strategies that are more based on using raw material that is harvested by hooking gears to produce fresh whitefish fillets since such catches gives the best quality (Akse et al., 2013; Heike & Henriksen, 2013). A bigger focus for the Norwegian industry should be to acquire wet whitefish that is caught by hooking gears. According to Nilssen et al. (2014), those firms in Norway that are focusing on acquiring more wet whitefish caught by hooking gears are performing better than the firms that acquire raw materials caught by netting gears. So if the Norwegian industry would start to focus more on differentiated marketing strategy based on processing and selling fresh whitefish fillets, they would also need to focus on procurement strategy based on acquiring fresh whitefish caught by hooking gears.

## 6.2 Political implications

Another finding of this thesis is that the Icelandic firms that have more complex structures are more profitable than the firms that have less complex structure. For the Norwegian industry to become more profitable, they may need to develop similar firm structures supporting a more market-oriented approach. This would however require pivotal steps to be taken by the Norwegian authorities. First, the Participation Act must be changed allowing the firms to operate their own harvesting vessels with quotas. This implies allowing the firms to integrate vertically towards harvesting activities to support their land based plants, but in a different way than what is practiced today (Svorken & Dreyer, 2007; Isaksen, 2007).

The benefit of such change would be that the firms would get more control over their supply chain which is of great importance to be able to perform better (Prajogo & Olhager, 2012). The whitefish fillet industry is like other fisheries industries, exposed to high degree of external uncertainty mainly due to the state of the nature (Ottesen & Grønhaug, 2003). In Iceland such uncertainty has encouraged many whitefish fillet firms to integrate vertically because it gives those firms better control over the supply chain (Hagfræðistofnun, 2011). The benefit of having better control over the supply chain is multifactorial. First, this may make it easier to enter into long term contracts with buyers of whitefish products abroad (ibid.). Moreover, the knowledge that is generated within the firms that have better control over the supply chain due to vertical integrations becomes better (ibid.), and this may lead to a competitive advantage if competing firms cannot match that knowledge (Grant, 1996). Vertically integrated firms in Iceland are also engaged in more investments than is the case of non-vertically integrated firms (Hagfræðistofnun, 2011). Therefore, it seems probable that if the Norwegian firms were allowed to develop structurally in the same direction as the Icelandic firms, the Norwegian industry could possibly become more profitable than is the case today.

To change the Participation Act will require political leadership. One reason is the second paragraph of the Marine Resource Act of 2008 which states that the wild living marine resources is owned by the Norwegian fellowship. Just as the first paragraph of the Fisheries Management Act of 2006 in Iceland states that the wild living marine resources is owned by the Icelandic fellowship. One way would be to still operate an individual vessel quota (IVQ) system which is practiced today instead of changing the IVQ system to an individual

transferable quota (ITQ) system which is practiced in Iceland. The Norwegian government had the chance to legalize an ITQ system when the IVQ system was legalized in 1990, but choose not to because it was considered that the quotas would end up in the hands of the privileged few (Standal & Aarset, 2008). But if it is politically objective that the Norwegian firms should become more profitable, a major step would be to allow them to operate their own harvesting vessels under an IVQ system in order to let them control their own supply chain in a more market-oriented manner.

### **6.3 Administrative implications**

In the managerial implications I stated that if the Norwegian firms are ought to pursue better differentiated marketing strategies that focus on processing fresh whitefish fillets in line with what is practiced in Iceland, they would need to get access to fresh whitefish supplies of high quality. Wet whitefish harvested by hooking gears is considered being raw material of higher quality than whitefish harvested by netting gears (Akse et al., 2013; Heike & Henriksen, 2013). It would therefore be favorable if the Norwegian government would emphasize more harvesting with hooking gears by allocating more quotas to harvesting vessels that use hooking gears as their main fishing gear. Such allocation would support better procurement strategies, which is pivotal to execute better differentiating marketing strategies.

Movement of the quota year in Norway would also be favorable to get the supply distribution for cod slightly more leveled out throughout the year. Such movement might lead to more fishing during the second half of the year when cod fishing is minimal because most quotas are usually caught in the first half of the year when cod is easily available due to spawning season.

### **6.4 Limitations and further studies**

An empirical study with research questions of such comprehensiveness as the questions in this study, clearly puts limitations on what can be examined mainly due to time and other resource constraints. Based on the theoretical framework that emphasized the theory of competitive advantage of nations (Porter, 1990), I limited my focus on factor conditions and firm strategy, structure and rivalry where my main attention was on firm strategy. No attention was put on domestic demand condition or the variable that focuses on related and supporting industries.

According to the theoretical framework, demand condition applies to home demand. Since most of the fish products from both Iceland and Norway are exported to foreign markets, I concluded that home demand would not shape the competitiveness of the whitefish fillet industry significantly. I also concluded that to examine related and supporting industries would be so comprehensive and complex that it would be beyond the scope of this master thesis.

The timeframe did also put limitations on this study in that the analyzing period was limited to the years from 2003 to 2012. It can therefore only be ascertained if an industry has competitive advantage in that period and not prior to that period. This analyzing period covers a period with a very volatile environment where the world economy went from times of prosperity to times of adversity. With such environmental uncertainty, it should appear more clearly where the industry is located that might have a competitive advantage over the same industry that is located elsewhere.

Data access was also a huge challenge in this study. Data on the same level (firm vs. firm and industry vs. industry) should be analyzed instead of industry level data vs. firm level data as I was forced to do few times. It can therefore be questioned if the data proxies chosen expose valid results. A further study to safeguard this methodological problem would be to redo the study, but then with firm level data from Iceland to confirm that the results from this study are robust. Such study would also be more capable of answering the question if the context between strategy, structure and profitability is a prerequisite for increased profitability in the whitefish fillet industry.

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