

# **Norwegian Seafood Positioning Study**

## **Initial Report**

Frank Asche, Håvard Hansen, Yuko Onozaka and Ragnar Tveterås

University of Stavanger

31. August 2011

## Contents

1. Background and Objectives .....	1
2. Market Positioning.....	2
2.1. Economic analysis of market positioning.....	3
2.2. Marketing analysis of market positioning.....	5
3. Data.....	10
3.1. Data available from NSEC .....	10
3.2. Data considerations .....	11
4. Market positioning analysis – market shares .....	12
4.1. From global to national market shares.....	12
4.2. Market shares of fresh salmon products in the French market .....	15
4.3. Econometric analysis of demand for Norwegian salmon .....	21
4.4. Econometric analysis of market share.....	23
5. Market positioning analysis – consumer eating frequencies and preferences .....	26
5.1. Analysis of French Eating Frequencies.....	26
5.2. Econometric analysis of salmon eating frequencies.....	28
5.3. Preference for Norwegian salmon.....	31
5.4. Positioning of Norwegian salmon .....	34
5.5. Concluding remarks .....	40
6. Market positioning analysis – value chain margins .....	42
6.1. Value chain margins for fresh salmon .....	42
6.2. Value chain margins for smoked salmon .....	44
7. Preliminary Conclusions and Recommendations .....	47
Literature .....	47
Appendix: NSEC consumer surveys.....	1

## 1. Background and Objectives

The objective of this report is to suggest a scope for the project “*Posisjonerings-studie for norsk sjømat*” funded by *Fiskeri-og havbruksnæringens forskningsfond* (FHF). The scope includes (1) objectives, (2) variables to be measured, (3) theoretical and methodological approaches, and (4) empirical scope in terms of geographic markets and products to be analyzed.

FHF's market group has stated that there is a need for the Norwegian seafood industry to increase the understanding of how the position of its products develops over time in the market. In particular, there is a need for analyses that provide an improved basis for comparative analyses over time and across countries. The vision is that the positioning study should be repeated annually or bi-annually to provide benchmarks of the market position of the industry's products.

We propose the following overall objective for the seafood positioning study:

***The overall objective of the project is to develop a positioning study that can be used as a supporting tool in measures aimed at increasing the export value and value added of the Norwegian seafood industry.***

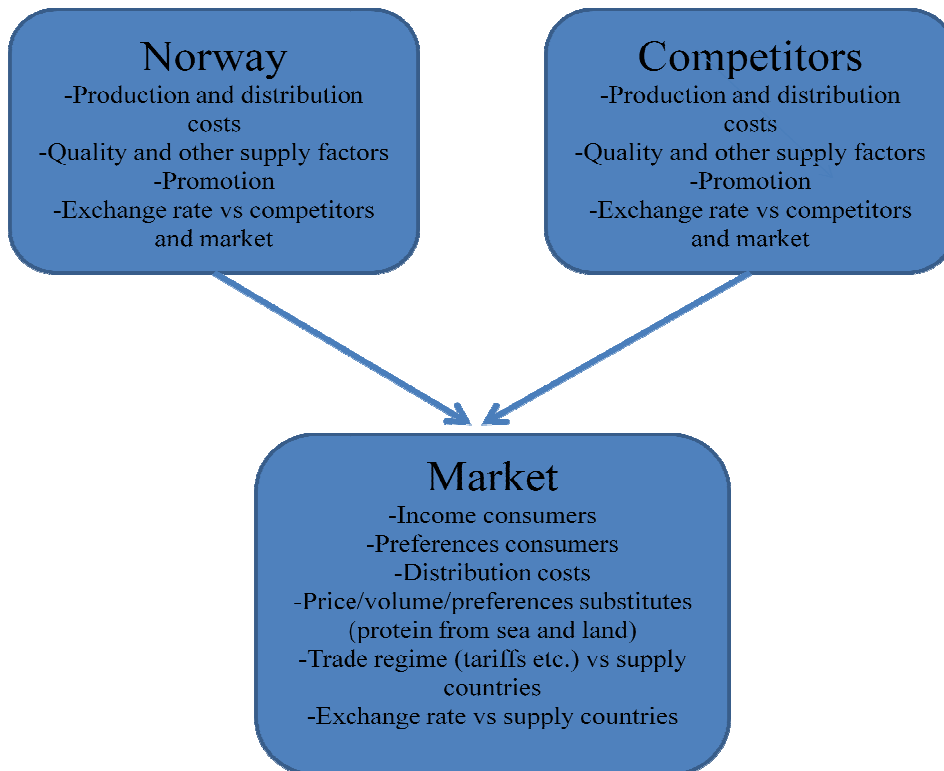
## 2. Market Positioning

The project title refers to a “positioning study”. In this chapter we explore in a fairly nontechnical manner the concepts of *market position* and *market positioning*. These are concepts that may have somewhat different interpretation in the two disciplines that will provide the theoretical and methodological basis in this project – economics and marketing.

A typical definition of *market position* is a ranking of a brand, product, or company, in terms of its sales volume relative to the sales volume of its competitors in the same market or industry. This definition is concerned with *market share*. Market share is obviously an important measure of a market position. But it is also crucial to understand other aspects of a market position. This includes dynamic aspects – how has e.g. market share developed over time. Furthermore, an analysis of market position is most useful if we can provide insights into the underlying causes of the current market position, or changes in market position over time.

A typical definition of *market positioning* is that it is an effort to influence consumer perception of a brand or product relative to the perception of competing brands or products. Its objective is to occupy a clear, unique, and advantageous position in the consumer's mind. This concept is related to consumer perceptions, and we will explore it further in section 2.2.

It is crucial to recognize that there are many factors through the value chain that influence market position in terms of price, volume and market share, as indicated by Figure 2.1. The fact that value chains for seafood products are international adds more factors determining market position, such as exchange rates and trade regime (tariffs etc.). It is necessary to account for all these factors in an analysis of market position.



**Figure 2.1. Factors determining price, volume and market share**

## 2.1. Economic analysis of market positioning

The market position of a product from a firm or a country in a market can be analyzed using microeconomic theory, more specifically the theory of competitive markets and theories of monopolistic markets. We will discuss this briefly here.

Market share can be defined by the volume of products. In other words, the market share of a firm (country) is defined by its sales volume divided by the sales volume of the total market. This is more frequent in industries where the products are fairly homogeneous. But often it is defined in terms of sales value, which is the product of price and sales volume. In that case, changes in market share can be caused both by price changes relative to competitors as well as volume changes.

In a competitive market no supplier has market power to influence the market price and the product is assumed to be homogeneous. In other words, it is difficult to distinguish products from different firms (or countries) by quality attributes etc. Hence, a supplier cannot differentiate its product from other suppliers. Reducing the price is the only mechanism to increase market share. In a competitive market which is in equilibrium, a supplier can only reduce the price in a sustainable way if its cost has been reduced. In the market for farmed salmon we have witnessed that as producers were able to reduce

their production cost over time, the declining unit cost has been accompanied by a declining price. If two firms (or countries) have an unequal cost development, the firm with the most favorable cost development can increase its market share relative to the other. It can be argued that the expansion of Norwegian salmon farming relative to several other countries since the 1980s is to some extent due to a more favorable cost development. These differences in cost development have of course several underlying causes related to natural conditions, regulation and factors that the firms control themselves.

Monopolistic competition is a form of imperfect competition where many competing producers sell products that are differentiated from one another. This means that the products are substitutes but, because of differences such as quality characteristics and branding, are not exactly alike. In this situation the degree of product differentiation influences the opportunities for changing the price relative to the competitors.

The degree of product differentiation between different firms (or countries) is central in determining how a price change will influence the demand for the product and thus the market share. If a product is highly differentiated from the competitors' products then the demand is less affected by a price change.

Microeconomic theory also predicts that when a firm is able to increase the quality of a differentiated product in the sense that consumers' utility from the consumption of the product increases then this will allow the firm to increase the price to some extent without it having any negative effect on demanded quantity. Alternatively, if the firm keeps the price constant this would lead to an increased demand for its product.

Seafood product categories range in the degree of product differentiation. There are fresh seafood products that are regarded as fairly homogeneous by consumers. Some seafood product categories are also much more differentiated, for example, smoked salmon in the French market.

The economic theories we briefly presented here have several implications for the analysis of market position. First, they provide analytical approaches to the analysis. Second they have implications for the data we would like to have.

In the empirical analyses in this project we would like to:

- 1) Estimate econometric demand models (Asche and Salvanes, 1996; Tveterås and Tveterås, 2010) to understand how demand for different seafood products from different countries are influenced by price changes and income changes in a market. For example, estimates of own-price elasticity will tell us if price reductions for a Norwegian product will lead to an increase or decrease in Norwegian market share.
- 2) Estimate econometric co-integration models (Berg Andersen et al., 2009; Asche et al., 2007) to understand e.g. (1) to what extent products from different

countries compete, and (2) how prices at different stages of the value chain develop, for example, how retail prices develop compared to Norwegian export prices.

- 3) Estimate econometric choice models (logit/probit) (Train, 2003; Eggert and Tveterås, 2004; Kumar et al., 2008) to understand how choices of different seafood products from different countries are influenced by consumer perceptions etc.
- 4) Estimate econometric market share models (Hanssens et al., 1990; Danaher and Brodie, 1992; Brodie and Bonfer, 1994) to understand factors that influence the market share of seafood products.

In this report we will provide examples of the above described models and analyses that can be on the basis of the quantitative estimates from these models.

## 2.2. Marketing analysis of market positioning

This section addresses how we conceive of the basic concept of positioning from a marketing perspective. It further elaborates on theories and methods typically employed in marketing related positioning studies. Moreover, some possible variables to study within this context are presented.

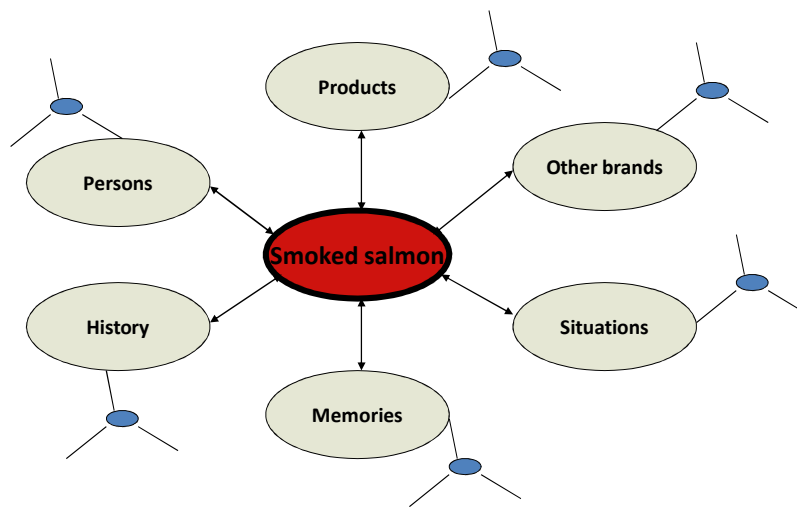
According to basic text book definitions, positioning relates to the *act of designing the company's offering and image to occupy a distinctive place in the minds of the target market* (Kotler and Keller, 2009; Ries and Trout, 2000). Accordingly, positioning is a mental construction in the consumer's mind, where different firms are placed in a hierarchy of brands according to both similarities and differences.

When analyzing how either a brand, or different brands (or products) are positioned, an important point of departure is to specify what marketers call *category membership*, meaning the products or sets of products with which a brand competes and which function as close substitutes (Kotler and Keller, 2009). Positioning thus refers to how a certain brand or product is conceived of by the consumer, relative to the competitors in the same category. Hence, positioning is category specific, although it is possible for a brand to hold fairly equal positions across different categories (e.g Tine in categories like milk, cheese and yoghurt). Given this description of the concept, what is then the preferable course of action when attempting to study the position Norwegian seafood products hold in international markets? First, it seems obvious that data needs to be

gathered on an individual consumer basis. Secondly, it is important to understand that the term “Norwegian seafood” is not one single product, and thus it does not have a category membership. This implies that any fruitful study needs to acknowledge that different products (e.g. smoked salmon, fresh cod, frozen herring) might be members of different categories, and thus hold different positions based on different associations in these different categories. Thirdly, brand or product positioning is a mental construction, and to tap into the position different products hold in the minds of the consumers calls for the study of associative memory structures. Based on this, there are two ways to approach the question on how Norwegian seafood is positioned in foreign markets:

**1) A study of the associative networks that exists in the mind of consumers of a particular product.** Study of associative networks imply that the focus is on tapping into the information networks held in consumer memory, and establish an understanding of what they associate with the product in question. Figure 2.2 below exemplifies this approach to the research question. Here we see a mental map portraying the node networks of a consumer’s memory. For the concept “Smoked Salmon”, consumers may have all kinds of associations, and these may for example be related to other products (smoked mackerel), persons (Jamie Oliver), situations (hotel lunch buffet’s), memories (breakfast at Grandma’s), etc. While these are just examples, the figure shows how pieces of information and impressions are interconnected in an associative network. The links between information elements are the nodes, and the strongest nodes are the ones first activated when consumers are exposed to the concept in question. Hence, if a consumer hears the word “smoked salmon”, and immediately thinks of Christmas holiday breakfasts when visiting Grandma and Grandpa, this means that the link between the product and this historical experience is the strongest in the network. Hence, the strongest association is between the product and this memory.

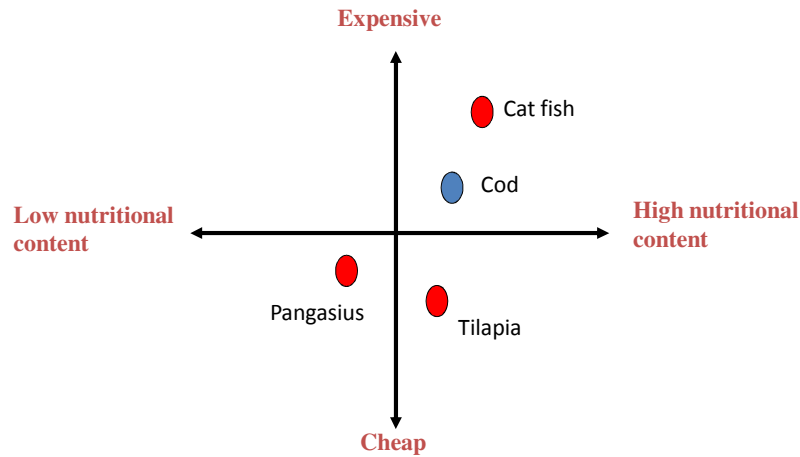




**Figure 2.2. Associative networks for smoked salmon**

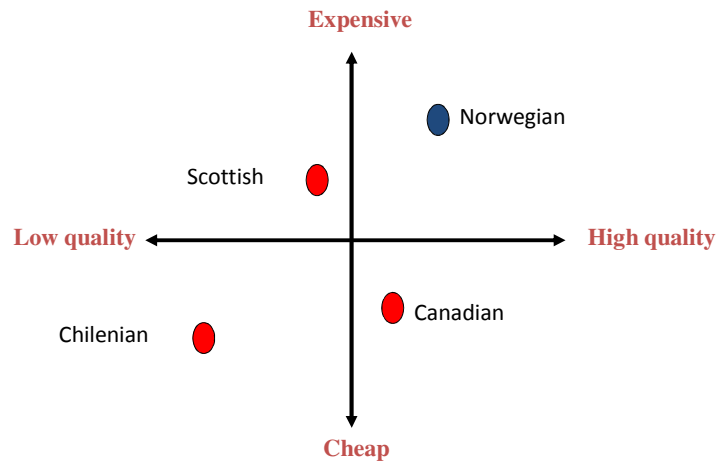
In the example above, we have tried to explain one more important feature of associative networks. While associations like brand, quality, price, packaging, etc is primary associations, it is also important to scrutinize what marketers call secondary associations. Country-of-origin, celebrity endorsers (persons) and situations are all examples of secondary associations, as they are not directly related to the product. However, research has found such secondary associations to be important parts of the position a product or brand holds in the target segments.

2) **A study of how Norwegian seafood is perceived in comparison to the most important competitors.** Here, the idea is to establish perceptual maps where a selection of Norwegian seafood products is compared to other offers in chosen market segments. Contrary to the studies of associative networks described above, perceptual maps typically assess how a product or a brand is perceived on pre-specified variables, for example price, status, quality, etc. To portray the aim of such a research strategy, we refer to the following to figures.



**Figure 2.3. Example of perceptual map of different fish species**

The first figure portrays a perceptual map where Cod is contrasted to Cat fish, Pangasius and Tilapia on variables Nutritional content and price. Hence, this is an example of a perceptual map on a category level (fish filets), with different species of fish mapped against each other. This is just a hypothetical example – later we will present perceptual maps based on analysis of data from NSEC. The next figure (below) is a map on a more specific product level, where frozen Salmon from different countries are compared on variables Price and Quality. When examining perceptual maps, these figures can serve as examples of how a variety of variables can be plotted against each other to arrive at a bench marking pattern for the products chosen. A tentative analysis based on the NSEC data is presented later in this report.



**Figure 2.4. Example of perceptual map of salmon from different countries**

### 3. Data

Based on the analytical approaches we have outlined the project requires data on both observed market prices and quantities, and consumers' information set and subjective preferences. Some of the data we would like to have are very costly. Most of the study must be based on data collected or purchased by NSEC. These data have generally been acquired by NSEC for other purposes than our study. This implies that we may not have all the variables that we would ideally like to have. Access to and use of the data must be agreed with the NSEC to ensure that we do not violate agreements with data suppliers to NSEC, etc.

The study requires the following types of data, to some extent depending on the final scope of the positioning analyses:

- Export and import data on seafood products (from NSEC, Eurostat, NMFS).
- Data on volume/value/price at retailer level (i.e. final products to consumers) from GfK, TNS, AC Nielsen, etc.
- Interview based consumer surveys about knowledge, preferences and consumption habits.
- Data on factors that influence production and distribution costs (first hand prices, wage index, capital price index, transport price index, etc.)
- Data on GDP, private consumption, exchange rate, inflation in markets.
- Data on prices and quantities of protein from agriculture.

#### 3.1. Data available from NSEC

This section presents an overview of some of the data that are potentially available from NSEC. We have been given access to some of this data during the first phase of the project for the preliminary analysis.

NSEC purchases retail based consumer panel data for some countries and species. Table 3.1 presents a matrix of which countries and species data are purchased, where the colour green indicates that data are available. In most countries data are from 2005. In all countries there are demographic profiles on the consumers of relevant products. Furthermore, for some countries there is information on how much consumers buy from different retail chains.

**Table 3.1. Retail based consumer panel data by country and species**

	Salmon	Herring	Cod	Haddock	Conv.	"All"
France						
Norway						
Italy						
Portugal						
Russia						
Spain						
Sweden						
Germany						
UK						
USA						

Source: Norwegian Seafood Export Council

The NSEC also undertakes interviews of households in several countries with focus on particular species to learn about consumers’ knowledge, preferences and consumption habits. These interviews are undertaken by professional survey companies based on a dialogue and instructions from NSEC. The appendix to this report shows an overview of these data by country and species.

### **3.2. Data considerations**

There is much data available on seafood value chains. Most of the data are acquired by the NSEC. The relevance of these data depends on what hypotheses one wants to test regarding the position of Norwegian seafood. Data coverage is poorest in the following areas:

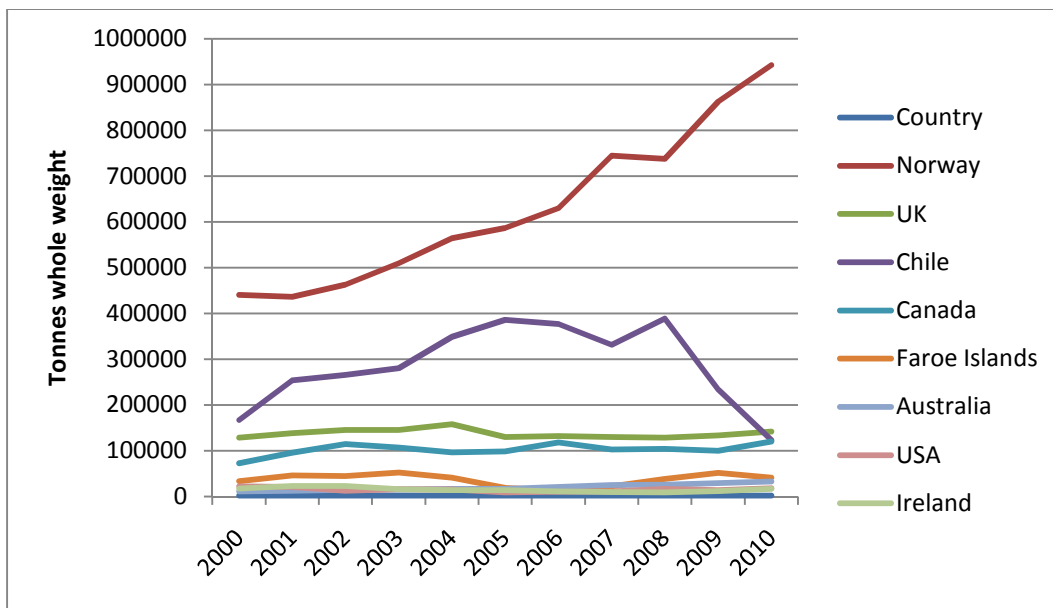
- More detailed product categories at the retail level. If one wants to analyze differentiation and substitution at a finer level this would be necessary.
- Certain aspects of consumers’ associations, preferences and behavior. This would include own surveys of consumers.

## 4. Market positioning analysis – market shares

In this and the following two chapters we provide examples of how we can approach a market positioning study. Our focus is on salmon and the French market, but we start with a global view.

### 4.1. From global to national market shares

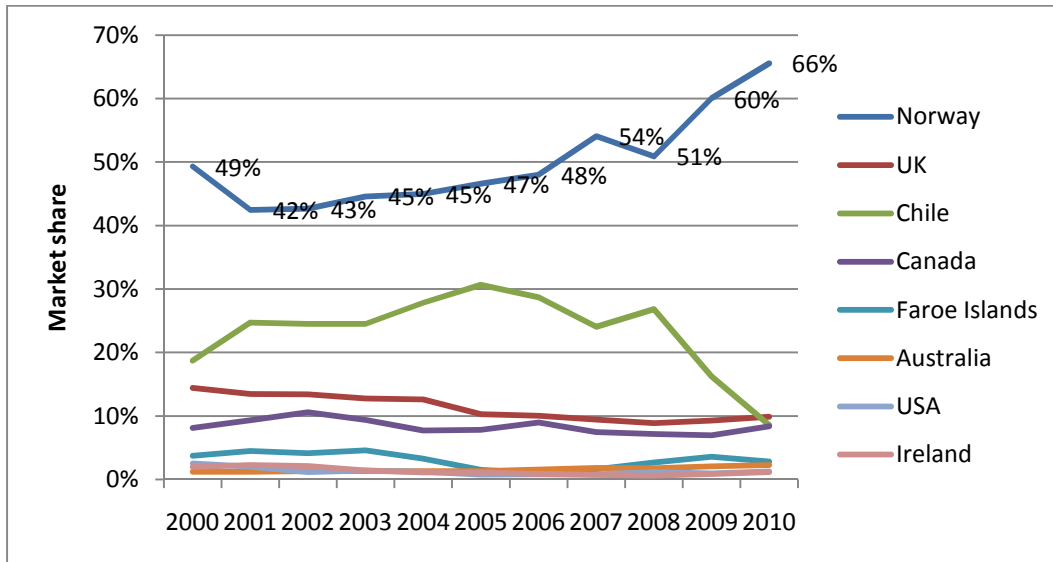
The first step in a market positioning study of a particular product in a particular geographic market is to examine the global development. Changes in market share in a particular geographic market may reflect changes in factors that determine competitiveness and market shares globally. As shown in figure 4.1 below Norwegian production of farmed salmon has increased significantly almost all years since 2000. We see that Chile also exhibited rapid growth until 2005, after which it flattened out and then disease lead to a dramatic decline in production from 2008. Other producer countries have not experienced any significant growth after 2000.



**Figure 4.1. Global production Atlantic salmon round weight**

The consequence of these developments in terms of global market share is that Norway after an initial decline, has seen an increase in its market share from 42% in 2001 to 66% in 2010, as shown in figure 4.2. Chile, on the other hand, has seen a decline from

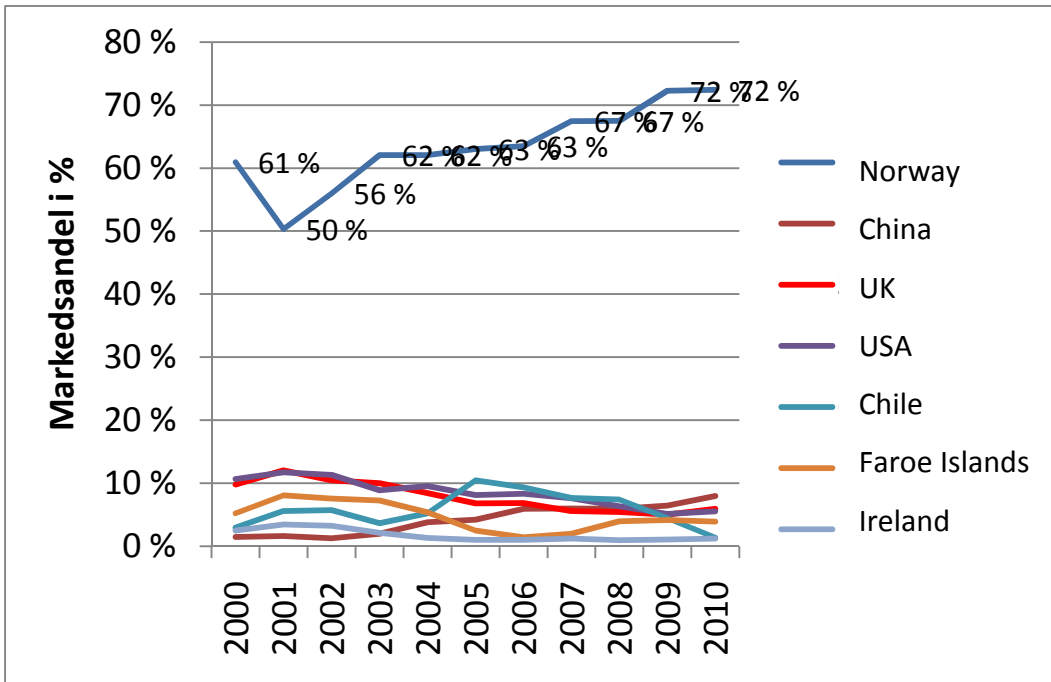
30% in 2005 to less than 10% in 2010. UK has had more stable market shares, but declining from 15% in 2000 to 10% in 2010. Canada's market share has been slightly below 10% since 2000.



**Figure 4.2. Global market shares Atlantic salmon**

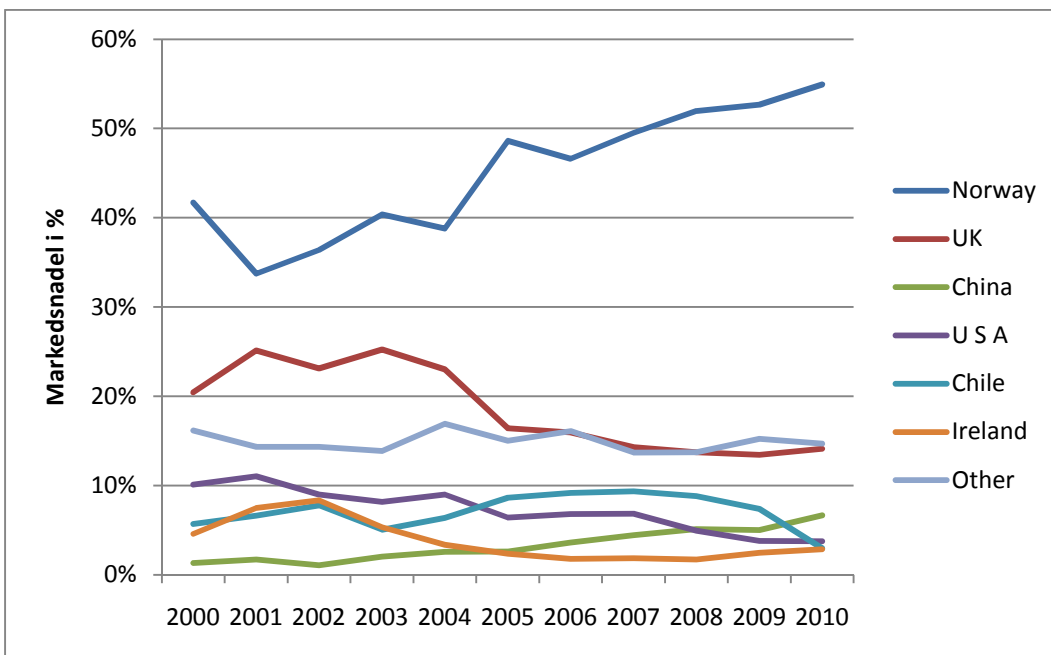
These global market share developments can to a large extent be explained by developments in upstream production. Disease is the main cause for Chile's decline, with poor regulation as underlying cause. When one examines development in market share in regional or national markets one should bear this in mind.

Figure 4.3 shows the development of market shares of EU import of salmon products in round weight equivalents. We see that Norway's position is stronger in the EU market than globally, and also that Chile has a much weaker position than in the global market. However, we also see the same pattern of growth of Norwegian market shares and decline of Chilean market shares driven in part by the Chilean disease problems.



**Figure 4.3. Market share of EU import of salmon products in round weight equivalents**

Finally, we examine the French market for salmon products. As shown in figure 4.4, Norway has a dominant position also in that market. Furthermore, Norwegian market share has increased from around 35% in 2001 to around 55% in 2010. This has been at the expense of salmon from UK, Chile and Ireland.





#### Figure 4.4. Import market shares salmon products French market

The development in volume from the global to the national level is summarized in Table 4.1. This table shows the change in volume measured by round weight equivalents for different suppliers. We see for the 2005-2010 period that the Norwegian volume supplied to France increased less in percentage terms than the Norwegian volume supplied to the EU, which again increased less than the total Norwegian supply to the global market. But Norwegian supply to the French market increased more than the total supply to the French market, implying that Norway increased its market share in the French market, as it did in the EU market and globally.

UK experienced during the 2005-10 period a growth in supply to the French market that was in percentage terms around the same as growth in its total supply. Chile experienced a significant decline in its supply to the French market, but less than its total supply to the global market. Ireland experienced a much higher growth to the French market than its total supply to the global market. These developments suggest that the change in market share from the global level to the national level is not uniform - some countries strengthened their position in the French market relative to the change in their global position, while others weakened their position in the French market relative to the change in their global position.

**Table 4.1. Change in volume measured by round weight equivalents – from the Global via EU to French market**

<b>Global Atlantic salmon production</b>						
Periode	Norway	UK	Chile	Ireland	USA	Total
2000-2005	33%	1%	131%	-22%	-58%	41%
2005-2010	61%	9%	-68%	24%	97%	14%

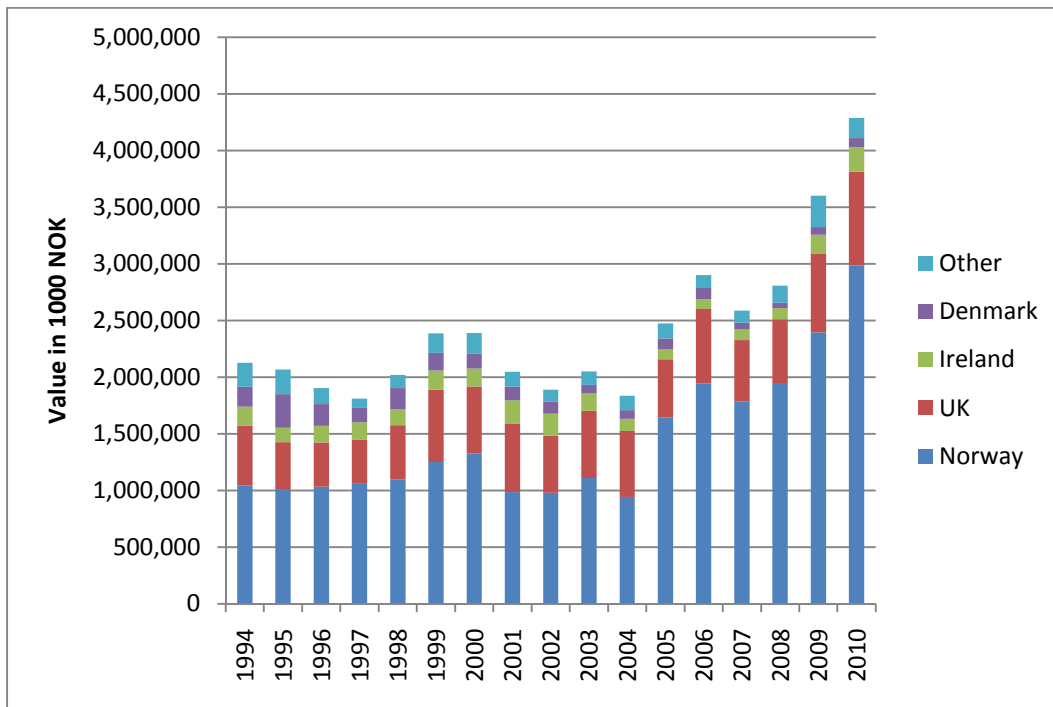
<b>EU import salmon products</b>						
Periode	Norway	UK	Chile	Ireland	USA	Total
2000-2005	39%	-7%	376%	-46%	2%	34%
2005-2010	52%	15%	-83%	63%	-10%	32%

<b>France import salmon products</b>						
Periode	Norway	UK	Chile	Ireland	USA	Total
2000-2005	50%	3%	95%	-34%	-19%	28%
2005-2010	45%	10%	-56%	56%	-25%	28%

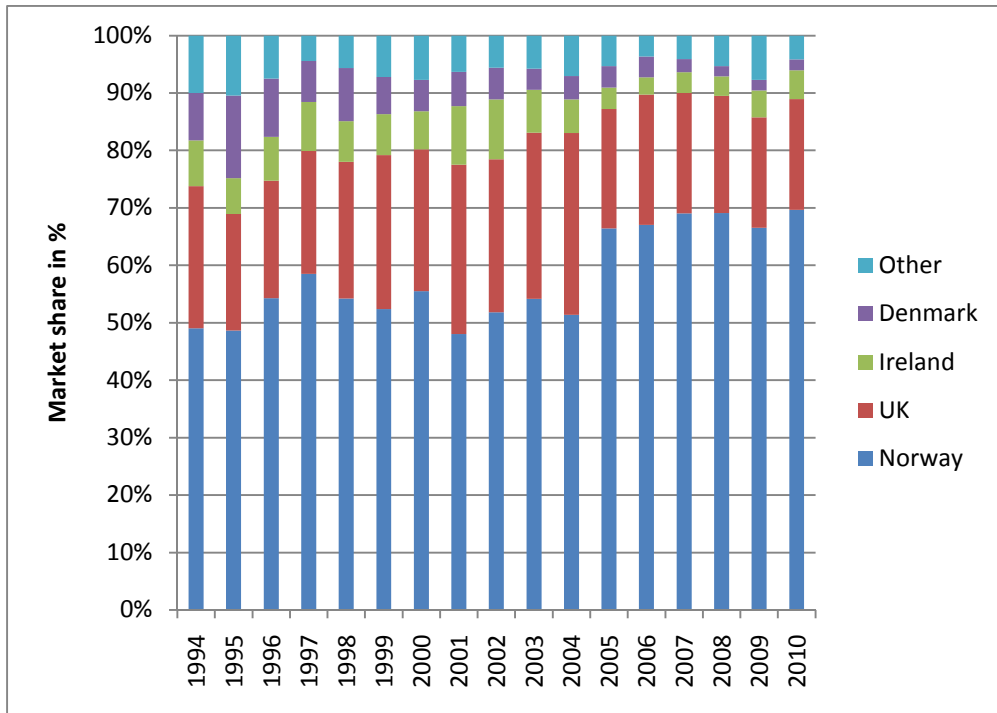
#### 4.2. Market shares of fresh salmon products in the French market

We now narrow the scope to focus on fresh salmon products to the French market. Since Norway supplies mostly fresh salmon products to this market it is appropriate to study fresh products in more detail. Figure 4.5 shows the development of import value of fresh salmon products to the French market by supplier countries. We see that the French import of fresh salmon has increased significantly since 2004, actually more than doubled in nominal terms.



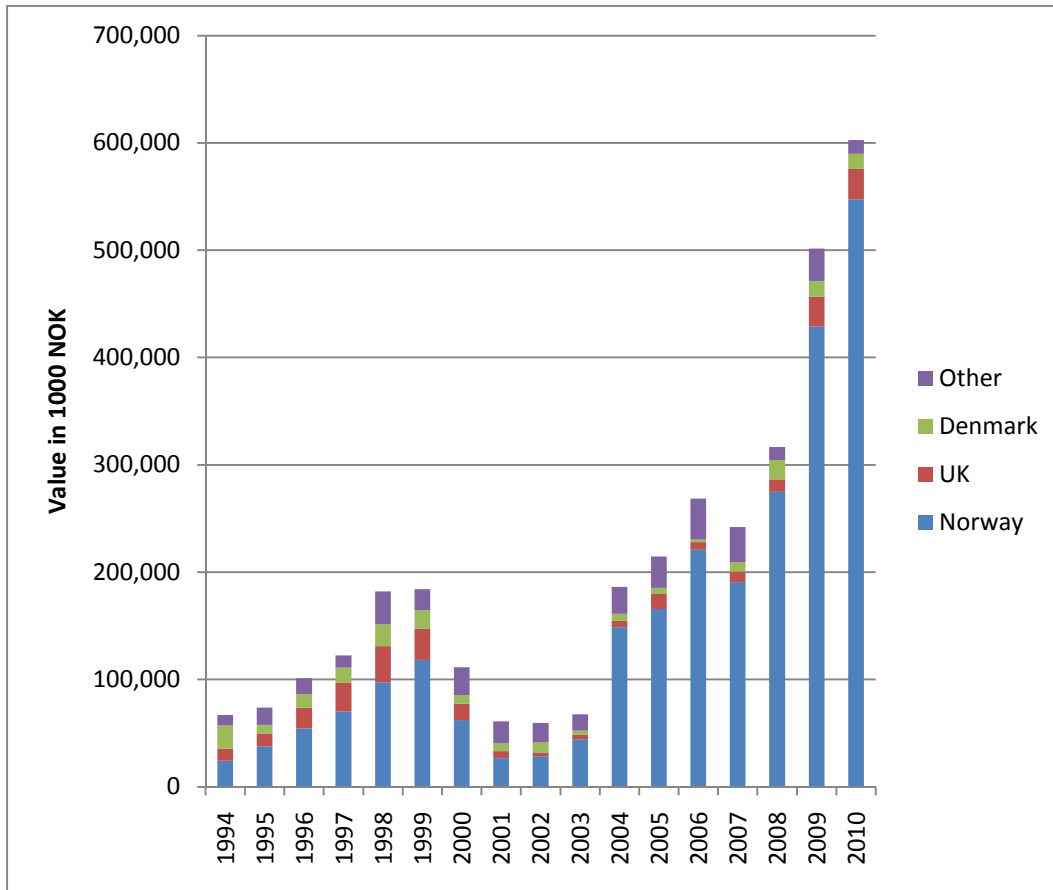
**Figure 4.5. Value of French import of fresh salmon products in 1000 NOK**

Fresh salmon products from Norway have increased their market share from around 50% in 2004 to 70% in 2010, as shown in figure 4.6. This has been at the expense of UK and partly Ireland, which have seen a decline in their market shares during the same period.



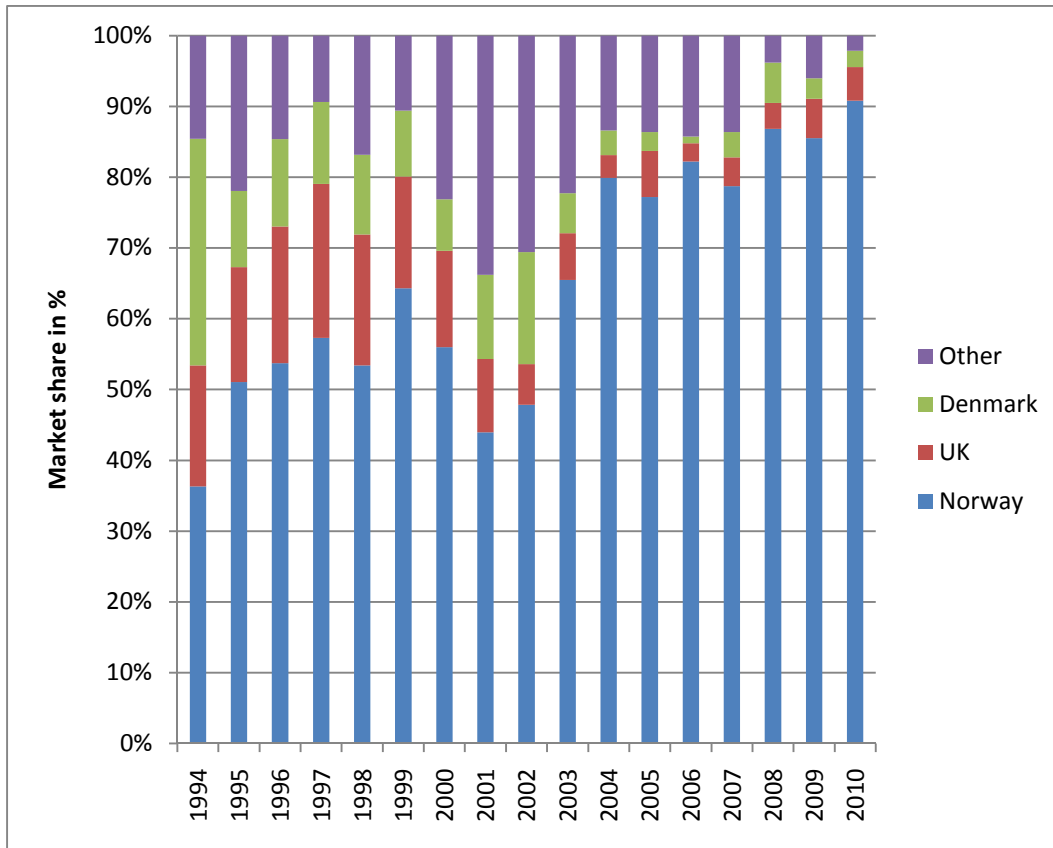
**Figure 4.6. Market share of French import of fresh salmon products**

Next, we narrow the scope even more, by focusing on the import of fresh salmon filet products to France. In Figure 4.7 we see a very dramatic increase since 2004, with Norway as the dominant supplier.



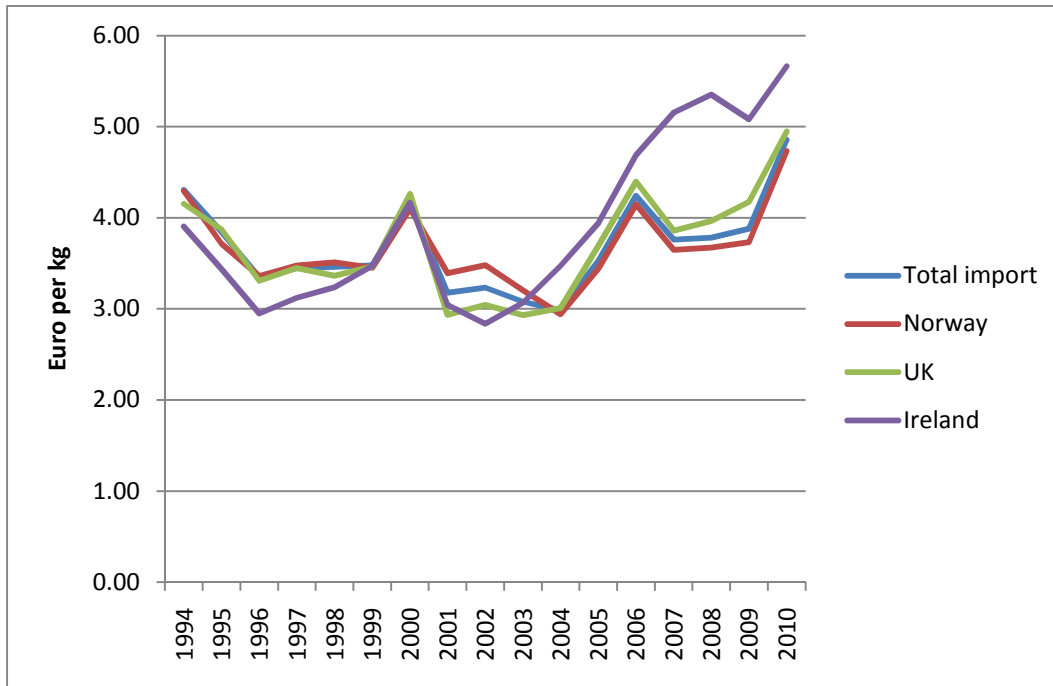
**Figure 4.7. Import value fresh salmon fillet to the French market**

Norway has driven the growth in French imports of fresh salmon fillet more than other countries, as is evident in Figure 4.8, which shows that Norway’s market share increased from around 80% in 2004 to over 90% in 2010. This has been at the expense of UK and Denmark, and several other smaller suppliers. The latter country primarily processes Norwegian farmed salmon, suggesting that the competitiveness of Danish processing plants relative to Norwegian processing plants has declined.



**Figure 4.8. Fresh salmon fillet market shares into the French market**

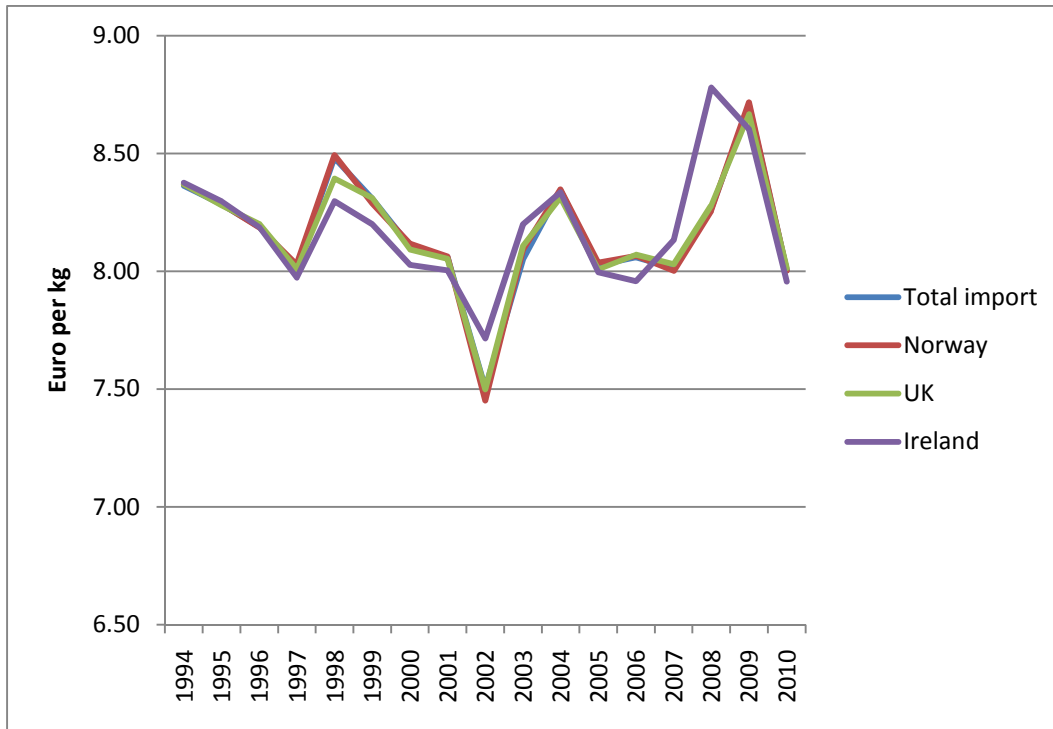
Next, we examine the development of French import prices for fresh gutted salmon and fresh salmon fillet. Figure 4.9 shows the French import prices for fresh gutted salmon from Norway, UK and Ireland, and the total average import price. We see that the import price for Norwegian and UK salmon is close to the total average, while the Irish salmon the last years has established a price premium.



**Figure 4.9. French import price fresh whole salmon**

The import prices of fresh salmon fillets from different suppliers follows each other fairly closely most year, according to Figure 4.10.

It is interesting to note that while the price of fresh whole salmon into the French market increased significantly from 2004 to 2010 increased significantly, the price of fresh salmon filets was more or less stable. This has contributed to a growth in the French import of the more processed fillets relative to the gutted fresh salmon. One explanation for this is increased productivity in the processing of whole salmon into salmon filets in Norway and other countries.



**Figure 4.10. French import price of fresh salmon fillet**

### 4.3. Econometric analysis of demand for Norwegian salmon

To understand the position of Norwegian salmon it is useful to understand how the French demand for Norwegian salmon products respond to changes in prices of Norwegian salmon and substitutes, incomes (or budgets for salmon), etc. In this section we present an econometric analysis of salmon demand for Norwegian fresh gutted salmon and fresh salmon fillet using French import data.

Table 4.2 presents estimates from an econometric model of demand for Norwegian fresh gutted salmon in France. According to the estimates a 1% increase in the price of Norwegian fresh gutted salmon in France leads to a 1% decline in demand. A 1% increase in the price of UK fresh gutted salmon in France leads to a 0.2% increase in demand for Norwegian fresh gutted salmon. The price of Irish salmon does not have a statistically significant effect on demand for Norwegian salmon.

We have used the total import “budget” for salmon products to proxy changes in the budget set aside for salmon. This is also correlated with income changes. We find that when the total budget for salmon products increase with one percent the demand for Norwegian fresh gutted salmon increases with 1.1%.

There is also a statistically significant trend increase in the demand for fresh gutted salmon from Norway that cannot be explained by the other variables. This may represent increasing preferences for fresh gutted salmon from Norway over time.

**Table 4.2. Regression model of demand for Norwegian fresh gutted salmon in France**

<i>Variable</i>	<i>Coefficient</i>	<i>St.error</i>	<i>t-Stat</i>	<i>P-value</i>
Import price Norwegian fresh gutted in EUR/kg	-1.032	0.098	-10.509	8.598E-21
Import price UK fresh gutted in EUR/kg	0.216	0.121	1.784	0.0760098
Import price Irish fresh gutted in EUR/kg	-0.014	0.072	-0.196	0.8446877
French total import value salmon products	1.126	0.066	17.181	4.929E-41
Time trend	0.001	0.000	1.857	0.0648342
Quarter 1	-2.626	0.594	-4.423	1.61E-05
Quarter 2	-2.567	0.594	-4.320	2.474E-05
Quarter 3	-2.564	0.599	-4.282	2.898E-05
Quarter 4	-2.620	0.622	-4.213	3.835E-05

R-squared = 0.99, N = 206.

Table 4.3 presents estimates from an econometric model of demand for Norwegian fresh salmon fillet in France. As for fresh gutted salmon the estimates indicate that a 1% increase in the price of Norwegian fresh salmon fillet in France leads to a 1% decline in demand. The price of UK salmon fillet does not have a statistically significant effect on demand for Norwegian salmon. The salmon “budget” effect is stronger for fresh fillet than for fresh gutted salmon. We find that when the total budget for salmon products increase with one percent the demand for Norwegian fresh salmon fillet increases with 2%.

There is also a statistically significant trend increase in the demand for fresh salmon fillet from Norway that cannot be explained by the other variables. This trend increase is stronger than for fresh gutted salmon, suggesting that preferences for fresh fillets have increased more than for fresh gutted salmon.



**Table 4.3. Regression model of demand for Norwegian fresh salmon fillet in France**

<i>Variable</i>	<i>Coefficient</i>	<i>St.error</i>	<i>t-Stat</i>	<i>P-value</i>
Import price Norwegian fresh fillet in EUR/kg	-1.074	0.194	-5.539	9.597E-08
Import price UK fresh fillet in EUR/kg	-0.158	0.099	-1.594	0.1125788
French total import value salmon products	1.953	0.257	7.583	1.281E-12
Time trend	0.006	0.001	4.964	1.486E-06
Quarter 1	-13.835	2.459	-5.625	6.251E-08
Quarter 2	-13.821	2.471	-5.593	7.333E-08
Quarter 3	-13.947	2.480	-5.624	6.291E-08
Quarter 4	-14.334	2.567	-5.585	7.652E-08

R-squared = 0.99, N = 206.

Econometric demand analyses can provide valuable insights into how different variables influence demand for Norwegian seafood products over time. However, they say little about the performance Norwegian seafood products relative to competitors. In the next section we will examine this more closely.

#### **4.4. Econometric analysis of market share**

In this section we try to increase our understanding of the factors influencing market share by estimating econometric models. Our objective is to quantify which factors influence or covary with the market share of a product from an export country in an import country.

Market share can be measured for a narrow product category (e.g. fresh fillet of salmon) or a broader product category (e.g. all fresh salmon products including fresh fillet, fresh whole salmon, etc.) or an even broader product category (e.g. all fresh and frozen salmon categories). Here we will focus on the market share of fresh gutted salmon and fresh salmon fillet from Norway in France.

Table 4.4 presents the estimates from a regression model of Norwegian import market share for fresh gutted salmon in France measured in value. We have included relative prices to Norway’s main competitors in the French market, UK and Irish fresh gutted salmon. The ratio between the price on Norwegian and UK salmon does not statistically significantly explain changes in Norwegian market share. An increase in the price of

Norwegian salmon relative to Irish salmon is associated with an increase in Norwegian market share. This implies that the cross price elasticity is such that although an increase in the relative price of Norwegian salmon may lead consumers to reduce quantity demanded this reduction is in percentage terms sufficiently less than the percentage increase in price, so the overall effect is to increase the Norwegian market share.

The next variable, the ratio of Norwegian to UK and Irish salmon export in round weight, is related to overall production growth in the three countries and can capture relative productivity development in the three countries. When Norwegian production increases relative to UK and Irish production this may be due to a favorable productivity development in Norway relative to these two competing countries in terms of physical productivity or factor prices. The highly significant positive coefficient indicates that this variable is associated with an increase in Norwegian market share. The quarterly dummy variables “Quarter 1” to “Quarter 4” suggest that Norwegian market share is lowest in the second quarter and highest in the fourth quarter, which may be due to shifts during the year in the relative abilities of Norway and its competitors to supply the French market. Finally, the significant positive coefficient associated with the time trend variable suggests that there are other unidentified factors that have contributed to increasing Norwegian market share over time, which are not captured by the other variables.

**Table 4.4. Regression model of Norwegian import market share for fresh gutted salmon in France in Euro**

<i>Variable</i>	<i>Coefficient</i>	<i>St.error</i>	<i>t-Stat</i>	<i>P-value</i>
Ratio Norwegian/UK import price in EUR/kg	-4.037	5.069	-0.796	0.4267203
Ratio Norwegian/Irish import price in EUR/kg	6.401	3.282	1.950	0.0525663
Ratio Norwegian/(UK+Irish) salmon export in round weight	2.317	0.221	10.495	9.042E-21
Time trend	0.039	0.010	3.995	9.133E-05
Quarter 1	34.844	5.004	6.963	4.804E-11
Quarter 2	33.134	5.118	6.474	7.347E-10
Quarter 3	34.487	5.087	6.779	1.355E-10
Quarter 4	36.528	4.883	7.480	2.366E-12

R-squared = 0.99, N = 206.

Next, in Table 4.5, we present estimates from a regression model of Norwegian import market share for fresh salmon fillet in France measured in value. We have included relative prices to Norway’s main competitor in the French market, UK fresh salmon

fillet. The ratio between the price on Norwegian and UK salmon fillet does not statistically significantly explain changes in Norwegian market share.

As for the model of fresh gutted salmon, an increase in the ratio of Norwegian to UK and Irish salmon export in round weight, is associated with an increase in Norwegian market share for fresh salmon fillet. The quarterly dummy variables “Quarter 1” to “Quarter 4” suggest that Norwegian market share for fresh fillet is lowest in the first quarter and highest in the third and fourth quarter. As with the previous model for fresh gutted salmon, the significant positive coefficient associated with the time trend variable suggests that there are other unidentified factors that have contributed to increasing Norwegian market share for fresh salmon fillet over time, which are not captured by the other variables.

**Table 4.5. Regression model of Norwegian import market share for fresh salmon fillet in France in Euro**

<i>Variable</i>	<i>Coefficient</i>	<i>St.error</i>	<i>t-Stat</i>	<i>P-value</i>
Ratio Norwegian/UK import price in EUR/kg	0.348	1.346	0.259	0.7961374
Ratio Norwegian/(UK+Irish) salmon export in round weight	2.573	0.456	5.643	5.701E-08
Time trend	0.146	0.021	6.826	1.029E-10
Quarter 1	28.635	3.286	8.714	1.143E-15
Quarter 2	31.844	3.407	9.348	1.884E-17
Quarter 3	32.200	3.308	9.735	1.45E-18
Quarter 4	32.091	3.169	10.126	1.058E-19

R-squared = 0.97, N = 206.

Both in the market share model for fresh gutted salmon and in the model for fresh salmon fillet we find a statistically significant trend growth in the market share that is not captured by the other explanatory variables. This trend growth can include shifts over time in French professional buyers’ or consumers’ preferences for Norwegian fresh gutted salmon relative to competitors. To uncover such shifts it is, for example, necessary to interview consumers about their preferences. In the next stages of our analysis we will look further into the position of Norwegian salmon in the French market in terms of consumers’ preferences and associations.

## 5. Market positioning analysis – consumer eating frequencies and preferences

### 5.1. Analysis of French Eating Frequencies

Next, we examine French consumers' eating habits using a consumer survey that is available for years 2005, 2007, and 2009 with specific questions regarding fresh/frozen salmon.

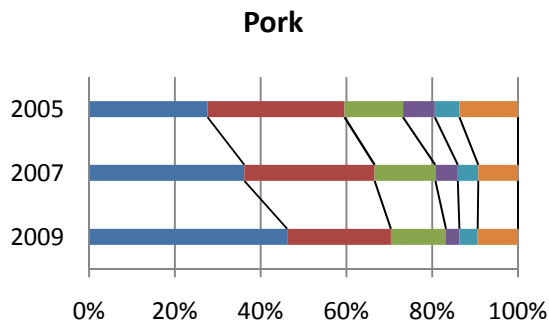
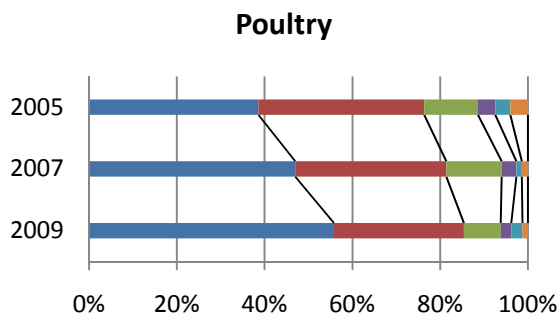
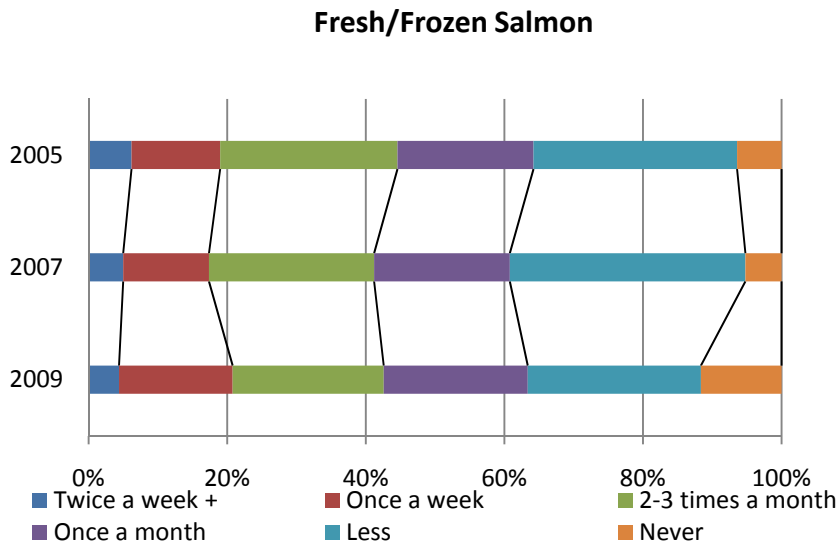
Figure 5.1 summarizes the responses regarding the consumption frequency of major protein sources for years 2005, 2007, and 2009. The eating frequency for fresh and frozen salmon seems somewhat decreasing, although it fluctuates and difficult to gauge the trend with only three year series. Most notably in the fresh/frozen salmon consumption, the percentage of people who never eats salmon seems to increase, while the percentage of people who eats salmon once a week or more seem to slightly increase. It is possibly indicating that there is more concentration in consumption—people who eat salmon frequently are eating *more* frequently while those who are eating salmon infrequently are eating *less* frequently or not eating salmon at all.

On the other hand, eating frequency of poultry, beef, and pork is increasing over time. The increasing trend is quite notable for those who eat these types of meat twice a week or more, while the percentage of “once a week” seem to decrease. Thus, it seems to indicate that many people are increasing the consumption frequency of poultry, pork, and beef substantially from 2005 to 2009. It is difficult to say if the consumption increase in some of meat categories indicates the consumption away from seafood, and salmon in particular. We also cannot say anything about the total weight of the consumption, since the data only provide information on the eating frequency. It may be worth looking at the per capita consumption and see if the story is consistent.

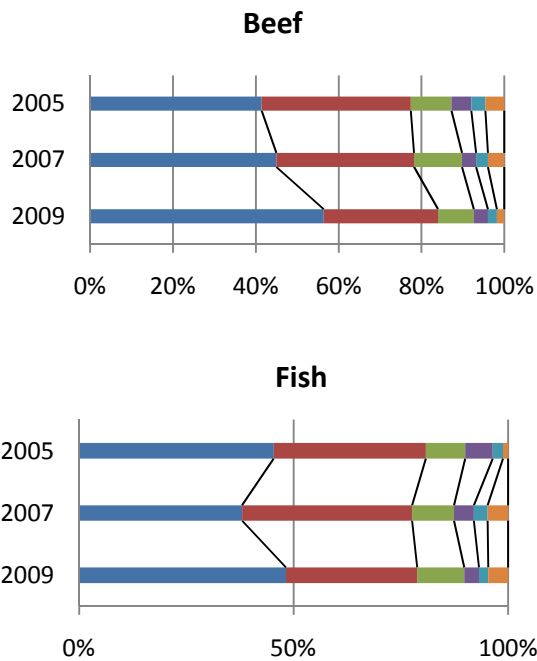
In general, compared to other major protein sources (poultry, beef, and pork), fish is eaten less frequently, as three meat categories have large number of people eating more than twice a week, up to 5-6 times a week, while no respondent indicated that they eat fish at the frequency of more than twice a week.

Salmon is listed as one of the most favored fish types (respondents can mention up to three fish species) among the largest number of respondents (36% in 2005, 33.1% in

2007, and 52.2% in 2009<sup>1</sup>). However, Figure 1 shows that the eating frequency of salmon is quite a bit less than the category of “fish” in general.



<sup>1</sup> This question was asked differently in 2005 and 2007 compared to 2009. In particular, 2005 and 2007 surveys recorded three fish types mentioned, while 2009 survey recorded first, second, and third mentioned fish types.



**Figure 5.1. Consumption Frequencies of Various Protein Sources**

## 5.2. Econometric analysis of salmon eating frequencies

An analysis is conducted to model the eating frequency of salmon using 2009 data. The dependent variables are formulated as follows:

- Y=4 Eat salmon twice a week or more
- Y=3 Eat salmon once a week
- Y=2 Eat salmon 2 to 3 times a month
- Y=1 Eat salmon once a month
- Y=0 Eat salmon less than once a month

In ordered logit estimation, we estimate factors that affect an individual to move up the category (e.g., from Y=0 to Y=1). The estimation results are shown in Table 5.1.

**Table 5.1. Salmon Eating Frequency Estimation Results**

<b>Variable</b>	<b>Coefficient</b>	<b>Standard Error</b>
<b>Constant</b>	-3.124 ***	0.607
<b>Good Taste (10 point rating)</b>	0.210 ***	0.055
<b>Good Impression (10 point rating)</b>	-0.101 **	0.041
<b>Easy to Prepare (10 point rating)</b>	0.004 ***	0.001
<b>Good Value (10 point rating)</b>	0.125 ***	0.043
<b>Family likes it (10 point rating)</b>	0.106 ***	0.033
<b>Type Important (10 point rating)</b>	0.228 ***	0.041
<b>Is Healthy (10 point rating)</b>	-0.174 ***	0.052
<b>Kids (1=Yes)</b>	0.422 **	0.177
<b>Eat Fish more than 4 times a week (1=Yes)</b>	1.299 ***	0.242
<b>Eat pork more than twice a week (1=Yes)</b>	0.323 *	0.188
<b>Eat fish more than twice a week (1=Yes)</b>	0.718 ***	0.199
<b>Farmed salmon contains dioxin (10 point rating)</b>	0.115 **	0.058
<b>Log-likelihood</b>	-628.566	
<b>Pseudo R<sup>2</sup></b>	0.14	
<b>N</b>	500	

Note: \*\*\*, \*\*, and \* indicate that the coefficient is significant at 1%, 5%, and 10% level, respectively.

The significant variables are:

- Stronger perceived good taste
- Stronger perception that salmon *does not* give impressive presentation
- Stronger perception that salmon is easy to prepare
- Stronger perception that salmon gives good value for the money
- Stronger perception that her family likes eating salmon
- Importance of fish types
- Stronger perception that salmon is *not* healthy food
- Stronger perception that farmed salmon contains dioxin
- Children in the household

The model was sensitive to specification, perhaps due to high correlation among some of the variables. The pseudo R<sup>2</sup> for this model is 0.14, which is reasonable. Most of the significant variables have expected signs, except for perception about healthiness of salmon and perception about dioxin contamination. The sign of healthiness perception is negative, indicating that individuals consume salmon more frequently when she has less strong belief that salmon is healthy food. The sign of perception about dioxin contamination is negative, indicating that people with stronger belief that farmed salmon has substantial dioxin contamination are more likely to eat salmon frequently. The result is counter-intuitive, and may suggest the reverse causality: people who eat

salmon more frequently are more knowledgeable about dioxin than infrequent users of salmon, and therefore, they tend to underweight the healthiness of salmon.

The perception about salmon farming did not have significant effects on the consumption frequency, except for dioxin contamination. This is probably due to the fact that the distributions of the responses of these variables are not so different between frequent and infrequent consumers.

Some variables are included for other meat consumption frequencies, but high consumption frequency of chicken and beef (more than 4 times a week, more than twice a week) did not come out to be significant. One pork variable (eat pork twice a week) is significant and positive, indicating that those who eat pork fairly frequently also tend to eat more salmon. As expected, fish eating frequency is affecting salmon eating frequency directly, although there is quite a large gap between fish eating frequency and salmon eating frequency, shown in Figure 1.

The marginal effects predicted by the model are shown in Table 5.2. The numbers represents the change in probability that a household is in a certain category (Y=0, 1, 2, 3, 4) when the variable increase by one unit. For example, the probability that a family with kids eat salmon 2 to 3 times a month is higher by 0.04 than a household without kids, and the probability is higher by 0.05 to eat salmon once a week. Thus, a household with kids have about 0.1 higher probability that they eat salmon at least twice a month than those without kids.

**Table 5.2. Marginal Effects**

	<b>Y=0</b>	<b>Y=1</b>	<b>Y=2</b>	<b>Y=3</b>	<b>Y=4</b>
<b>Good Taste</b>	-0.042	-0.010	0.021	0.025	0.006
<b>Good Impression</b>	0.020	0.005	-0.010	-0.012	-0.003
<b>Easy to Prepare</b>	-0.001	0.000	0.000	0.000	0.000
<b>Good Value</b>	-0.025	-0.006	0.012	0.015	0.004
<b>Family likes it</b>	-0.021	-0.005	0.010	0.013	0.003
<b>Type Important</b>	-0.046	-0.010	0.022	0.027	0.007
<b>Is Healthy</b>	0.035	0.008	-0.017	-0.021	-0.005
<b>Kids</b>	-0.086	-0.018	0.042	0.049	0.013
<b>Eat Fish more than 4 times a week</b>	-0.212	-0.099	0.070	0.181	0.061
<b>Eat pork more than twice a week</b>	-0.063	-0.017	0.030	0.040	0.011
<b>Eat fish more than twice a week</b>	-0.136	-0.042	0.062	0.091	0.025
<b>Farmed salmon contains dioxin</b>	-0.023	-0.005	0.011	0.014	0.004

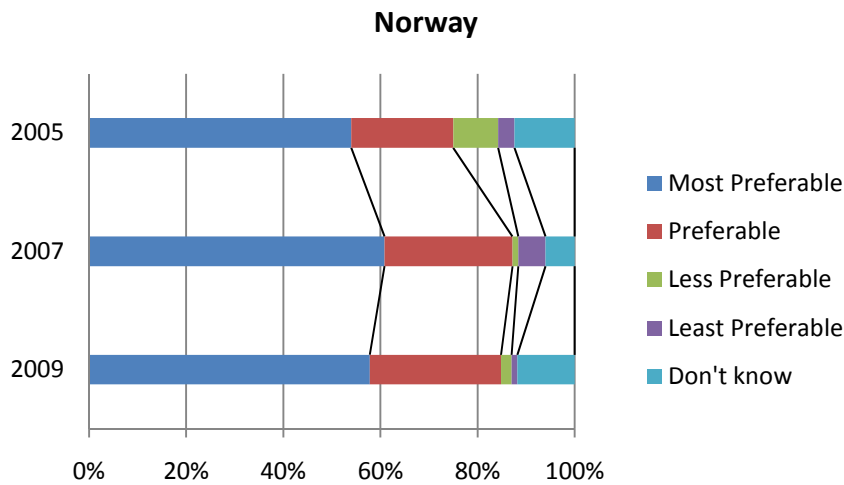
It seems that much more can be analyzed by looking at the potential substitute patterns from major meat categories to fish/salmon consumption. Perhaps a combination with

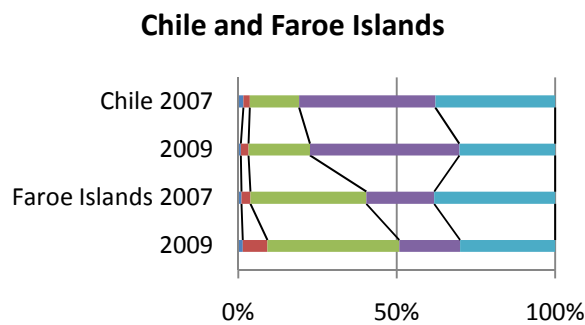
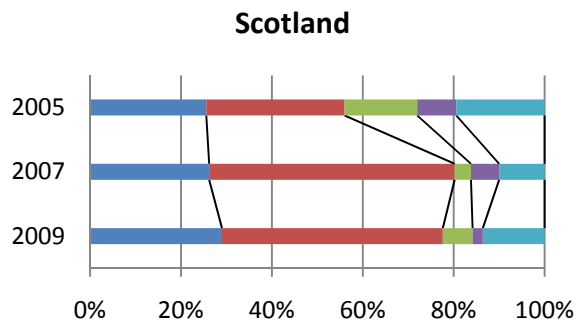


market level data may be useful. Although the market data we have does not have the level of disaggregation needed for an individual consumption patterns, we may be able to look at some country-level trends. We may consider potentially adding questions in the survey, if this direction of research is deemed relevant.

### 5.3. Preference for Norwegian salmon

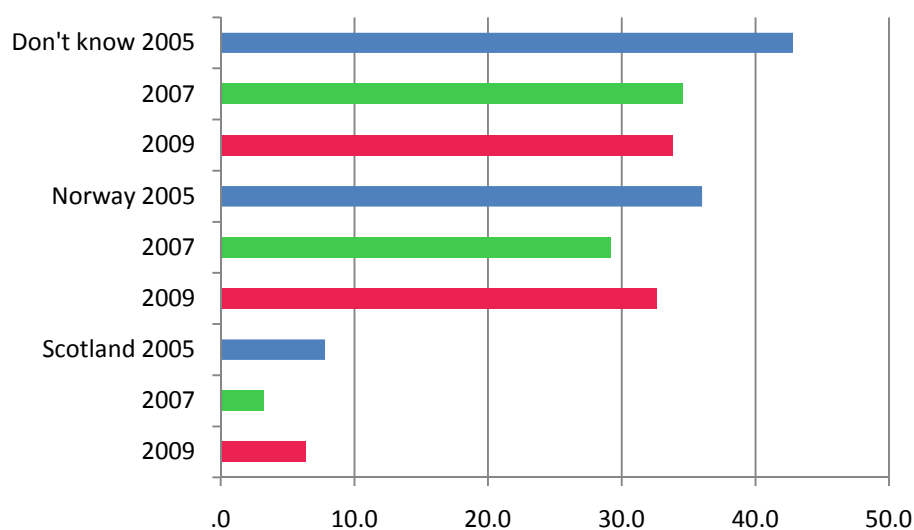
Figure 5.2 shows the summary of preference ratings of four leading country of origins for salmon. Judging by the ratings given by the respondents, Norway seems to have the strongest confidence from consumers, with the largest portion of respondents indicated that Norwegian salmon is either most preferable or preferable. Norway also has the smallest number of consumers who reported “don’t know” while the percentage of this category is much higher for Chile and Faroe Islands. The results also show that Norway and Scotland is closer in terms of consumers’ preferences compared to salmon from Chile and Faroe Islands. Note that the rating data from 2005 survey included other countries, thus, this variable is not available for Chile and Faroe Islands for 2005.





**Figure 5.2. Country of Origin Ratings**

Figure 5.3 shows the results from the question “from which country do you normally buy fresh/frozen salmon?” while excluding the people who do not buy salmon. The most notable feature is that the highest number of people (approx. 40%) does not know the country of origin (CoO) of their salmon. However, the percentage of “don’t know” is slightly declining from 2005 to 2007. It is also striking that those who know the CoO, they state that the products are from Norway (about 35% to 38%). The distant second is Scotland, with about 5%. Thus, two comments can be made: (1) most people do not know or do not care about where their salmon comes from; and (2) those who know/care, Norway is identified as the country of origin, much more frequently than other competitors. From both Figures 5.2 and 5.3, it shows that Norway is highly recognized and preferred by many French consumers. At the same time, there are large segment of consumers who either don’t know or don’t care about the CoO, although the percentage seems to be decreasing over time, may be indicating that this issue is becoming more important for French consumers and/or the CoO is becoming more visible at POP.



**Figure 5.3. From which country do you normally buy fresh/frozen salmon?**


Table 5.3 shows the cross-tabulation between where they prefer to get their salmon and where they normally get salmon. For example, there are 128 respondents (out of 426 salmon users) who stated that they would prefer to get salmon from Norway, and 89 people out of 128 say that they normally get Norwegian salmon. Twenty-six who prefer to get Norwegian salmon states that they don't know the origin of the salmon they normally purchase. Again, this shows the strong preference towards Norwegian origin compared to any other countries, and the majority of those who prefer Norwegian salmon are often purchasing Norwegian salmon. This may indicate that the consumers are *aware of* Norwegian salmon, they *recognize* that they are purchasing Norwegian salmon, and those who wants to buy Norwegian salmon are *able to find* Norwegian salmon.

**Table 5.3. Normal and Preferred Country of Origin**

		Normal Origin						Total
		Norway	Scotland	Chile	France	Other Countries	Don't Know	
Prefer Origin	Norway	89	2	0	1	10	26	128
	Scotland	15	16	0	0	6	16	53
	France	5	1	1	7	2	4	20
	Other Countries	15	2	1	2	15	10	45
	Don't Know	39	11	1	1	15	113	180
Total Count		163	32	3	11	48	169	426

## 5.4. Positioning of Norwegian salmon

In order to reveal the general position of Norwegian salmon in relation to other competitors, we utilized the survey data (2009) asking various dimensions about salmon for *each* of four countries; Chile, Scotland, Norway, and Faroe Islands. The dimensions include;

- a. High Quality
  - b. Is luxury food
  - c. Taste good
  - d. Has good reputation
  - e. Has a healthy fat content
  - f. Comes from cold and clear water
  - g. Has a good firm texture
  - h. Pure and natural product
- 
- Combined to create a single construct “**High Quality**”
- i. Overfishing is avoided
  - j. Expensive
  - k. Easy to find

To ease the analysis, following dimensions are combined to create a “High Quality” construct; *high quality, is luxury food, taste good, good reputation, healthy fat content, good firm texture, and pure and natural product*. In order to test the validity that these separate variables indeed measure a single construct, reliability was tested for each country, and all the Chronbach’s alpha are larger than 0.80, which indicates that they can be combined together. Likewise, item *comes from cold and clear water* and item *overfishing is avoided* are tested for the reliability, but the Chronbach’s alpha was low (about 0.50), indicating that they do not measure a single construct. In fact, item *comes from cold and clear water* is more closely related to quality dimension (consumers may perceive the fish from cold and clear water has high quality), confirmed with high values of Chronbach’s alpha.

Now we are looking at four dimensions (*High Quality, Expensive, Easy to find, and Overfishing is avoided*) to investigate the differentiation among country of origins. The mean scores for each dimension are summarized in Table 5.4. Most of the means are significantly different, based on the pair-wise comparison.

**Table 5.4. Mean Scores for Product Dimensions**

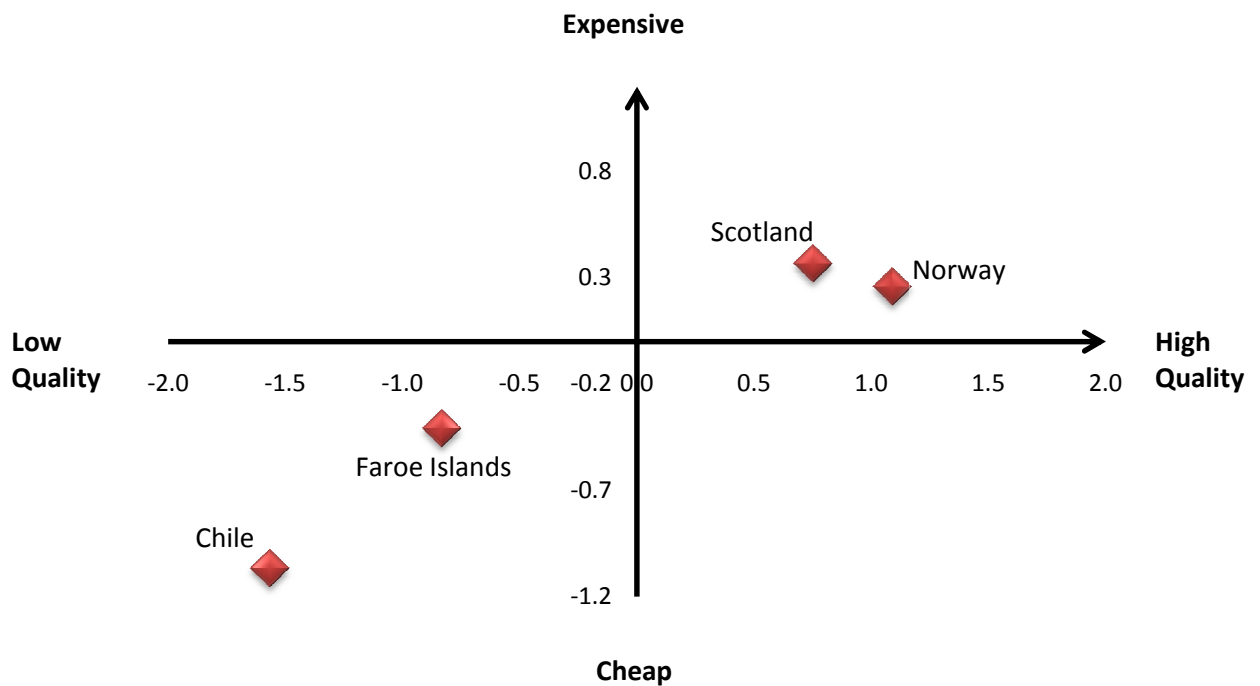
		N	Mean	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Easy to find	Chile	238	3.11 <sup>a,b</sup>	.183	2.75	3.47
	Scotland	381	7.44 <sup>a,c,d</sup>	.118	7.21	7.68
	Norway	399	8.23 <sup>b,c,e</sup>	.092	8.05	8.41
	Faroe Islands	259	3.69 <sup>d,e</sup>	.172	3.36	4.03
Overfish avoided	Chile	167	4.46 <sup>a,b,c</sup>	.207	4.05	4.86
	Scotland	276	6.36 <sup>a,d</sup>	.147	6.07	6.65
	Norway	291	6.44 <sup>b,e</sup>	.141	6.17	6.72
	Faroe Islands	179	5.20 <sup>c,d,e</sup>	.185	4.83	5.56
Expensive	Chile	149	5.01 <sup>a,b</sup>	.212	4.59	5.43
	Scotland	354	6.44 <sup>a,c</sup>	.106	6.23	6.65
	Norway	385	6.33 <sup>b,d</sup>	.102	6.13	6.53
	Faroe Islands	167	5.66 <sup>c,d</sup>	.171	5.33	6.00
Quality	Chile	324	4.57 <sup>a,b,c</sup>	.14	4.30	4.84
	Scotland	424	6.89 <sup>a,d,e</sup>	.07	6.74	7.03
	Norway	427	7.22 <sup>b,d,f</sup>	.06	7.10	7.35
	Faroe Islands	332	5.30 <sup>c,e,f</sup>	.12	5.07	5.54

Note: a,b,c,d,e, and f indicates that the mean is significantly different for at least 5% significance level.

Norway has the highest scores for all the dimensions, indicating the high positions in terms of these dimensions. Norwegian salmon is considered as easy to find, which may

be related to the high awareness of Norwegian CoO among French consumers compared to other exporting countries. It is not clear what it means to have the perception that “overfishing is avoided” as most of the salmon may be farmed. It is possible that this is related to environmentally friendly images for each country. If the eco-friendly dimension is something to be explored, a better phrasing may be employed to measure this construct.

We can also look at this more visually, when selecting two dimensions. Figure 5.4 shows the plot of quality and expensive dimensions where the axis represents the mean values from four countries. Norway and Scotland are closely situated, indicating that consumers perceive similar positions of Norwegian and Scottish salmon. Although Norwegian salmon is regarded as with slightly higher quality and less expensive at mean, the difference is not significant for expensive dimension. The difference is however significant for quality, showing that consumers regards Norwegian salmon with the highest quality among these four countries. This probably exhibits a better position for Norwegian salmon than Scotland salmon, as Norwegian salmon is perceived as with the highest quality but about the same perception of expensiveness as Scotland. On the other hand, Chile is regarded as cheap and low quality, while that from Faroe Island is between Chile and Norway-Scotland.



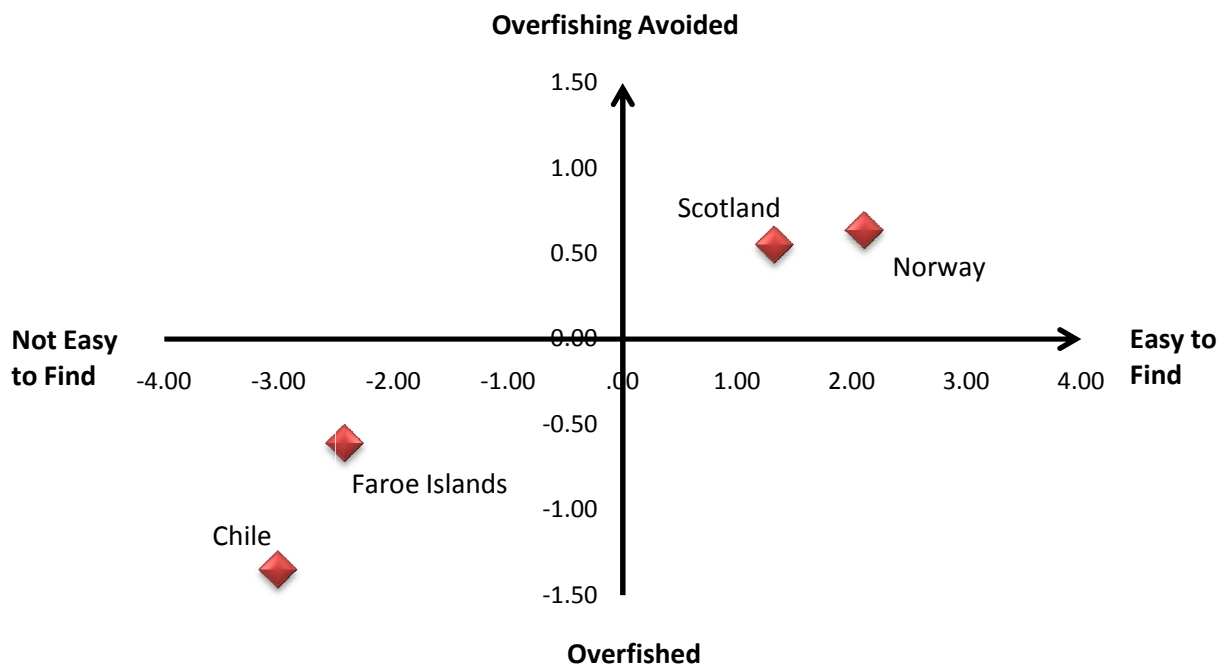
**Figure 5.4. Positioning of Norwegian salmon in quality-expensive dimensions**

The challenge for this analysis is that the sample size is somewhat limited. In Table 2, N indicates the available sample size out of the full sample of 500. There are many missing observations, because this question was asked only to those who eat salmon and

those who have knowledge about country of origin of their salmon. Thus, the positioning is based on the current users and does not tell anything about the perception among current non-users or those who don't know about CoO.

Given the significance size of the “don't know” in CoO, it may be worth exploring the market potential of this segment. For example, if there is a data on the marketing campaign, or the marketing expenditure on French market, we can assess if that had any affects on converting consumers from (1) non-users to users, (2) infrequent to more frequent users, (3) non-aware to aware of CoO, and (4) more favorable perception towards Norwegian salmon.

Figure 5.5 shows the plot of other two dimensions; Easy to find and Overfishing is avoided. The overall configuration is very similar to Figure 5.4, also showing the similar positions of Norwegian salmon to Scottish salmon, and Chile being perceived as both difficult to find and not environmentally friendly.



**Figure 5.5. Positioning of Norwegian salmon in Easy to Find-Overfishing Avoided dimensions**

In order to provide a “bigger picture,” a similar preliminary analysis using Quality-Expensive dimensions is conducted using available data from French survey of other years, as well as surveys from Germany (only year 2005 is available) and Russian surveys (years 2005, 2007, and 2009). Note that the countries that are asked to respondents are different for 2005 survey, which includes Norway and Scotland, but

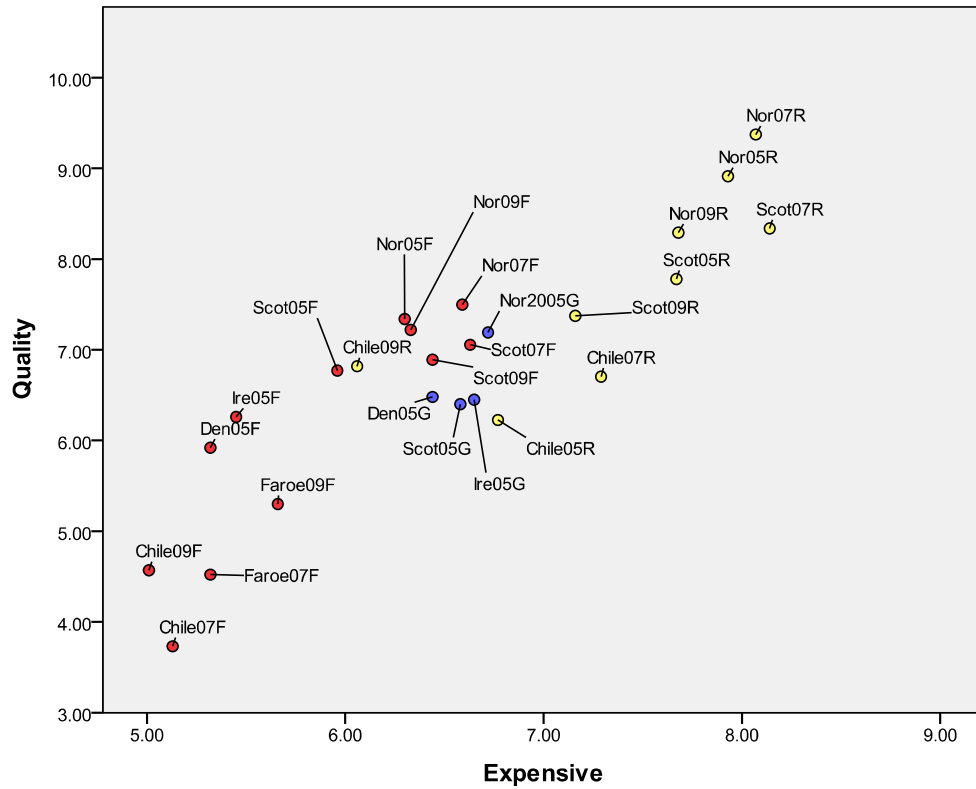
with Denmark and Ireland, instead of Chile and Faroe Islands. The diagram is shown in Figure 5.6.

The red dots indicate that they come from French survey, the blue indicate German survey, and the yellow indicate Russian survey. Note that, even though the scale are the same (from 1 to 10), different culture may have interpret the number differently, thus, higher numbers from Russian survey in general, may not necessarily reflect that Russian consumers consider Norwegian salmon higher quality than, for example, French consumers.

For French consumers, Norway positioned consistently at high-end in both quality and expensive dimensions, while Scotland is somewhat less consistent. Faroe Islands moved up from 2007 to 2009, while Chile moved up in quality from 2007 to 2009. In Germany, Norway seems to represent the high-end product with higher quality and prices compared to salmon from other countries, although these countries (Ireland, Scotland, and Denmark) are not as far away from Norway compared to Faroe Islands and Chile for French consumers.

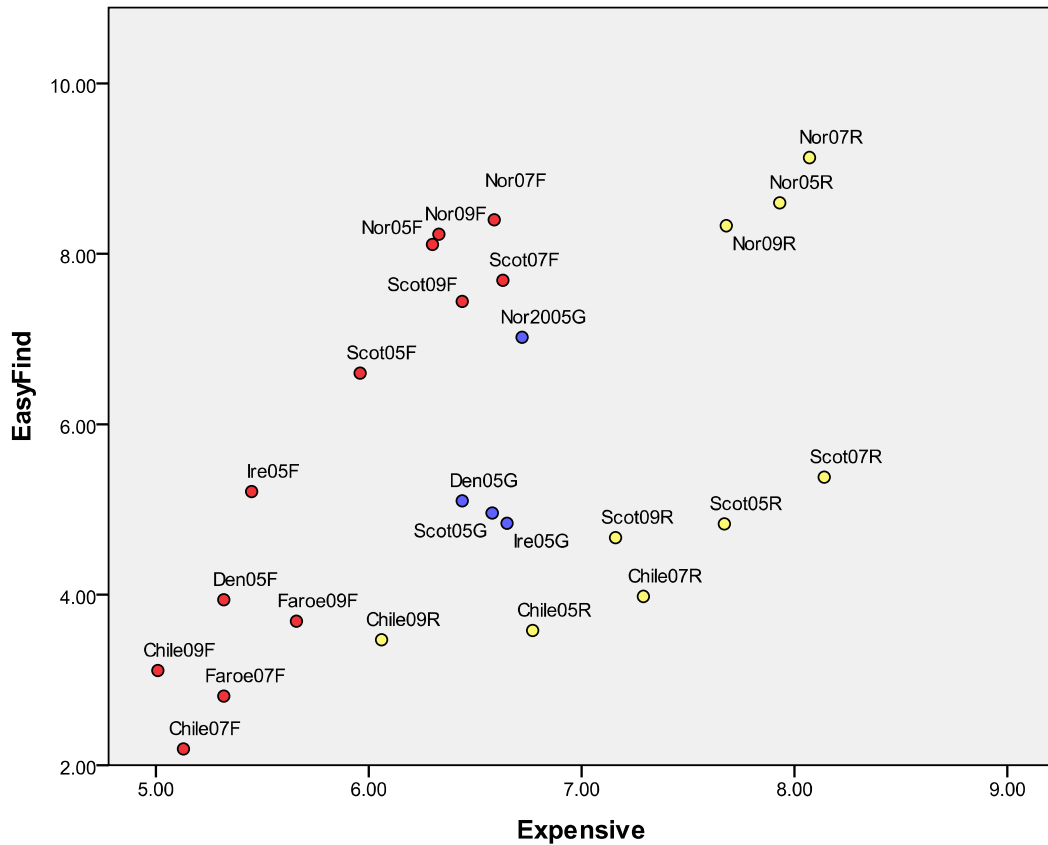
The positioning seems to move more for Russian consumers, although the relative positions seem fairly consistent over time. Salmon from Norway is the most high-end product compared to Scotland and Chile, although Scotland is close to Norway than Chile.





**Figure 5.6. Positioning of Norwegian salmon in quality-expensive dimensions over countries and years**

Figure 5.7 shows the plot between Expensive and Easy to Find dimensions. It shows that Norwegian salmon is considered by far the most easily available in Germany and Russia compared to other countries of origins. In France, Norway and Scotland has similar positions, although Norway consistently scored slightly higher than Scotland.



**Figure 5.7. Positioning of Norwegian salmon in Expensive-Easy to Find dimensions over countries and years**

### 5.5. Concluding remarks

Overall, the preliminary analysis conducted here show that Norwegian salmon has a strong position among consumers mind. Norwegian salmon is considered as of highest quality and easily available, but also expensive, compared to salmon from other major competitors. The direct competitor of Norwegian salmon seems to be the salmon from Scotland, as it holds the similar positions as Norwegian salmon in terms of all the dimensions considered here (quality, expensive, overfishing avoided, and to some extent, easy to find). However, the analysis also show that the country of origin is not information that all the consumers are aware or care about, indicated by the high percentage of consumers who do not know the country of origin of the salmon they purchase.

Other competition that Norwegian salmon faces in the marketplace is, of course, other protein categories (beef, pork, poultry, etc.), as well as other seafood. The data at hand does not shed much light on that side of the competition at the individual level choices,

however, it is probably possible to augment available data from other sources with the survey responses to explore this further if it is deemed relevant. This can also be combined with the data on the marketing activities to measure the effectiveness of such efforts.

## 6. Market positioning analysis – value chain margins

One aspect of market positioning is the distribution of earnings through the value chain. In this chapter we will provide examples of price margin analyses through the value chain. Of course, this analysis does not provide a full picture of margin developments, since the costs at each stage of the value chain should also ideally be accounted for. However, relevant cost data are generally not easily accessible. Margin analysis based solely on prices nevertheless provides valuable insights, since the fish raw material often represent a large share of costs – often 70%-80% for fresh products.

### 6.1. Value chain margins for fresh salmon

First, we will examine margins in the value chain for salmon from Norway to French retail. The basis for this analysis is the prices presented in figure 6.1 below.

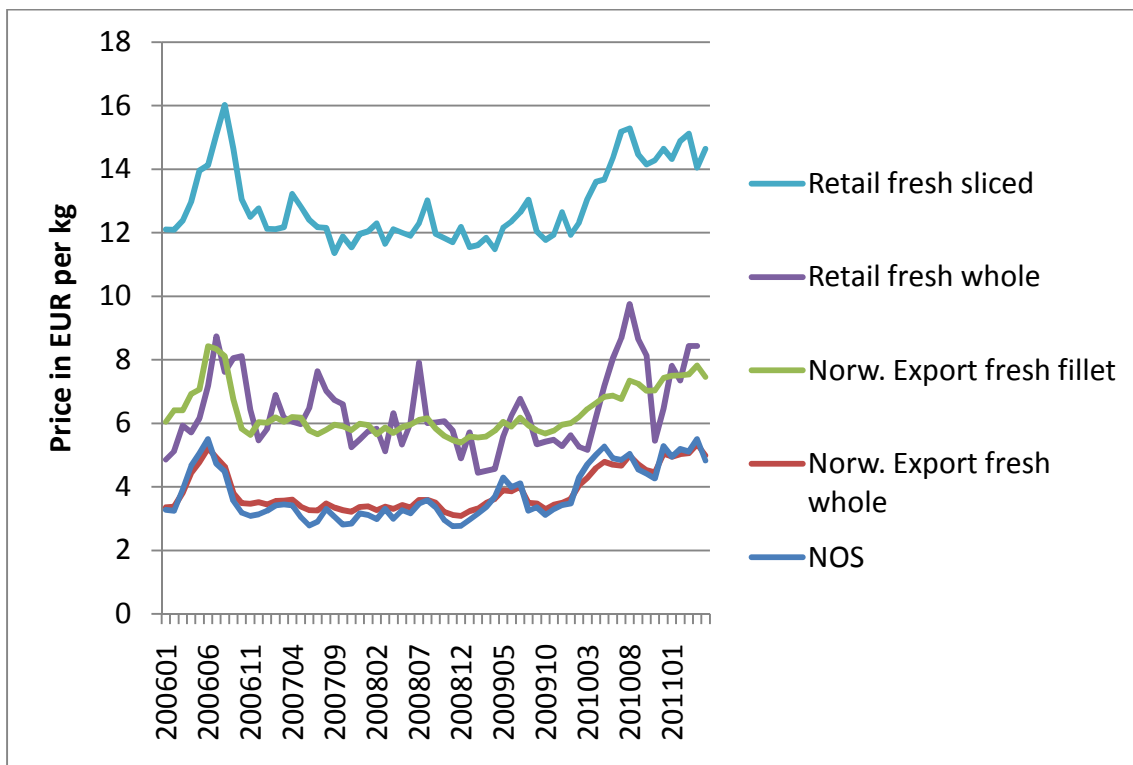
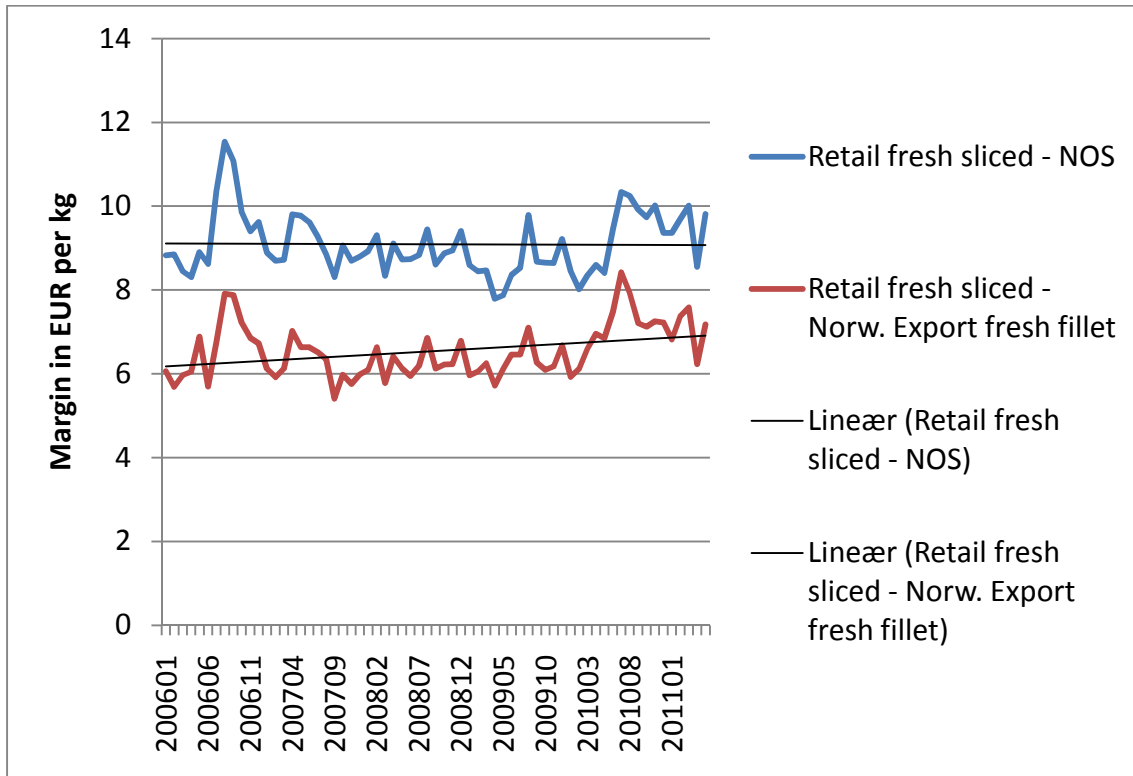


Figure 6.1. Prices in the value chain for salmon from Norway to France

First, we examine the margin development for fresh products. Figure 6.2 plots the margins between fresh sliced salmon in retail and NOS and Norwegian fresh fillet at the export stage. We have also plotted linear trend lines for these margins. For retail fresh sliced vs NOS we find no trend in the margin as indicated by the flat trend line, whereas for retail fresh sliced vs Norwegian export of fresh fillet we there is a slight upward trend in the margin.



**Figure 6.2. Margins for fresh products in Euro per kg**

A linear trend may be a too simple tool to analyze developments over time. Consequently, we have estimated econometric regression models where we include seasonal effects and year effects. Table 6.1 shows econometric estimates for the margin of retail fresh sliced price vs. NOS price in Euro. We ignore the seasonal shifts in prices captured by the seasonal dummy variables “Quarter 1” to “Quarter 4”. Our focus is on the year-specific effects related to the variables “Year 2007” to “Year 2011”. Here, 2006 is the so-called “base year”, so all estimates is related to this year. If there is a negative sign of the coefficient associated with one of the years, it means that the margin was lower than in 2006, while a positive sign means that the margin was higher than in 2006. We see here that relative to 2006 margins were lower in the period 2007-2010, but was higher than 2006 in 2011. However, according to the t-test and associated P-value the increase in the margin in 2011 relative to 2006 was not statistically significant.

**Table 6.1. Regression analysis of margin of retail fresh sliced price vs NOS price in Euro**

<i>Variable</i>	<i>Coeff.</i>	<i>St. Error</i>	<i>t Stat</i>	<i>P-value</i>
Quarter 1	9.095	0.212	42.838	1.712E-44
Quarter 2	9.184	0.212	43.255	1.011E-44
Quarter 3	10.012	0.216	46.335	2.38E-46
Quarter 4	9.646	0.216	44.642	1.813E-45
Year 2007	-0.444	0.242	-1.837	0.0714923
Year 2008	-0.546	0.242	-2.260	0.027732
Year 2009	-0.899	0.242	-3.720	0.0004632
Year 2010	-0.244	0.242	-1.008	0.3175895
Year 2011	0.355	0.325	1.094	0.278699

R-squared = 0.99. N = 65.

Next, we do a similar analysis of the margin of retail fresh sliced vs. Norwegian export fresh fillet in Euro. Here, we find that margins were lower in 2007-2009 relative to 2006, but higher in 2010-2011 relative to 2006.

**Table 6.2. Regression analysis of margin of retail fresh sliced vs. Norwegian export fresh fillet in Euro**

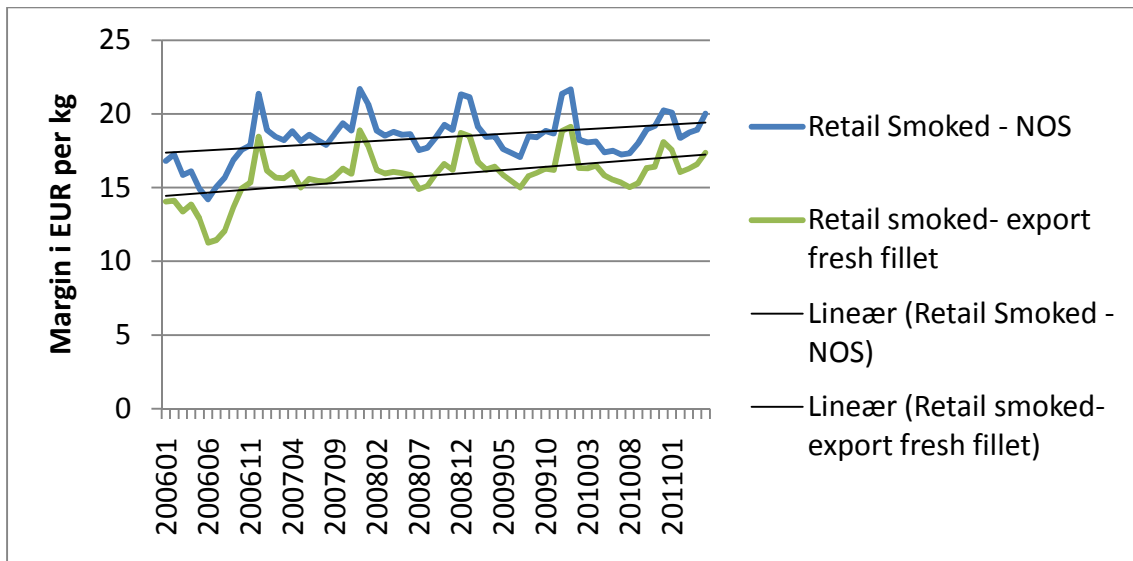
<i>Variable</i>	<i>Coeff.</i>	<i>St. Error</i>	<i>t Stat</i>	<i>P-value</i>
Quarter 1	6.292	0.176	35.808	2.763E-40
Quarter 2	6.542	0.176	37.236	3.374E-41
Quarter 3	7.034	0.179	39.339	1.739E-42
Quarter 4	6.695	0.179	37.442	2.504E-41
Year 2007	-0.438	0.200	-2.189	0.0328001
Year 2008	-0.357	0.200	-1.784	0.0798372
Year 2009	-0.363	0.200	-1.814	0.0750134
Year 2010	0.449	0.200	2.248	0.0285084
Year 2011	0.642	0.269	2.391	0.0202024

R-squared = 0.99. N = 65.

## 6.2. Value chain margins for smoked salmon

Next, we analyze the margins for smoked salmon. Compared to the previous section we are now examining a product where much more value is added by producers

downstream. We find that margins have been increasing from 2006 to 2011 according to Figure 6.3.



**Figure 6.3. Margins fresh salmon in Norway to smoked salmon in France in Euro per kg**

When we analyze the margins using econometric regression models in the following tables 6.3-6.5 we find a mixed picture. Margins in the years 2007-2011 are mostly significantly higher relative to 2006, but there is no clear upward trend. 2011 tends to be the year with the highest margins, but not much higher than the previous years.

**Table 6.3. Regression analysis of margin of retail smoked vs NOS in Euro**

<i>Variable</i>	<i>Coeff.</i>	<i>St. Error</i>	<i>t Stat</i>	<i>P-value</i>
Quarter 1	16.881	0.376	44.911	1.307E-45
Quarter 2	15.960	0.376	42.461	2.77E-44
Quarter 3	15.806	0.383	41.322	1.212E-43
Quarter 4	17.872	0.383	46.722	1.512E-46
Year 2007	2.188	0.428	5.115	3.959E-06
Year 2008	2.303	0.428	5.384	1.49E-06
Year 2009	2.119	0.428	4.954	7.056E-06
Year 2010	1.865	0.428	4.360	5.623E-05
Year 2011	2.709	0.575	4.712	1.661E-05

R-squared = 0.99. N = 65.

**Table 6.4. Regression analysis of margin of retail smoked vs. Norwegian export fresh whole in Euro**

<i>Variable</i>	<i>Coeff.</i>	<i>St. Error</i>	<i>t Stat</i>	<i>P-value</i>
Quarter 1	16.829	0.353	47.661	5.093E-47
Quarter 2	16.018	0.353	45.364	7.563E-46
Quarter 3	15.695	0.359	43.675	5.972E-45
Quarter 4	17.657	0.359	49.135	9.621E-48
Year 2007	1.992	0.402	4.959	6.934E-06
Year 2008	2.176	0.402	5.416	1.327E-06
Year 2009	2.147	0.402	5.344	1.724E-06
Year 2010	2.079	0.402	5.175	3.194E-06
Year 2011	2.756	0.540	5.103	4.13E-06

R-squared = 0.99. N = 65.

**Table 6.5. Regression analysis of margin of Retail smoked vs Norwegian export fresh fillet in Euro**

<i>Variable</i>	<i>Coeff.</i>	<i>St. Error</i>	<i>t Stat</i>	<i>P-value</i>
Quarter 1	14.077	0.364	38.660	4.457E-42
Quarter 2	13.318	0.364	36.576	8.834E-41
Quarter 3	12.829	0.371	34.619	1.689E-39
Quarter 4	14.921	0.371	40.266	4.933E-43
Year 2007	2.194	0.414	5.295	2.061E-06
Year 2008	2.492	0.414	6.015	1.438E-07
Year 2009	2.655	0.414	6.408	3.276E-08
Year 2010	2.558	0.414	6.174	7.921E-08
Year 2011	2.996	0.557	5.380	1.511E-06

R-squared = 0.99. N = 65.



## 7. Preliminary Conclusions and Recommendations

This report has provided a menu of analytical tools for a positioning study that encompasses theories and methods from economics and marketing. The data used in the analysis here are predominantly data collected or acquired by the Norwegian Seafood Export Council.

The analysis presented here focused on the French market and included:

- Market share analysis using descriptive and econometric methods (Chapter 4).
- Positioning study on consumer data using survey data (Chapter 5).
- Margin analysis of the value chain between from Norway to French retail (Chapter 6).

The market share analysis indicates that the increase in Norwegian market share for fresh salmon products in the French market is much due to upstream factors, such as higher productivity growth in farming than other countries. Relative prices to competitors play a smaller role. However, there is also a trend growth in Norwegian market share that is probably due to increased preferences for Norwegian salmon among professional buyers and consumers.

The positioning study on French consumers finds that Norwegian salmon has occupied a fairly strong position in the quality-expensive dimension and availability-expensive dimension, also relative to its competitors.

We investigate the nominal margins in Euro between French retail prices and Norwegian NOS and export prices for the period 2006-2011. For fresh products the margins have been stable or declining, and just recently increased. The margins between smoked salmon in retail and Norwegian fresh raw material have been more or less stable over time. Based on these findings one can conclude that on the one hand Norwegian suppliers have been able to capture a fairly high share of value creation. On the other hand these margin developments may have given limited incentive to promote salmon for agents downstream in the value chain.

This report demonstrates the scope of a positioning study through the topics and methodological approaches we have presented here. We believe that to understand the position of a seafood product in its final market it is necessary to account for factors through the entire value chain from the producer country to consumer, but with an emphasis on the factors in the final market determining product position.

## Literature

Asche, F. and K. G. Salvanes (1996) "Dynamic Factor Demand Systems and the Adjustment Speed Towards Equilibrium," *Canadian Journal of Economics*, 29, S576-S581.

Asche, F, S. Jaffry and J. Hartman (2007) Price transmission and market integration: Vertical and horizontal price linkages for salmon. *Applied Economics*, 39, 2535-2545.

Asche, F., R. Menezes and J.F. Dias (2007) Price transmission in cross boundary supply chains. *Empirica*, 34, 477-489.

T. Berg Andersen, K. Lien, R. Tveterås and S. Tveterås (2009). "The Russian Seafood Revolution: Shifting Consumption towards Aquaculture Products", *Aquaculture Economics and Management*, vol. 13(3), pp. 191-212.

Brodie, R.J. and Bonfrer, A. (1994). "Conditions when market share models are useful for forecasting: further empirical results", *International Journal of Forecasting*, 10, pp. 277-285.

Danaher, P.J. and Brodie, R.J. (1992). "Predictive accuracy of simple vs complex econometric market share models", *International Journal of Forecasting*, 8, pp. 613-626.

H. Eggert and R. Tveterås (2004). "Stochastic Production and Heterogeneous Risk Preferences: Commercial Fishers' Gear Choices", *American Journal of Agricultural Economics*, Vol. 86(1), pp. 199-212.

Hanssens, D.M., Parsons, L.J. and Schultz, R.L. (1990). *Market response models: Econometric and time series models*, Boston: Kluwer.

Kotler, P. and K. Keller (2009). *Marketing Management*. Pearson, 13th edition

Kumar, G., K. Quagraine, C. Engle, (2008) 'Factors that influence frequency of purchase of catfish by U.S. households in selected cities,' *Aquaculture Economics and Management* 12, 252-267.

Ries, A. and J. Trout (2000). *Positioning: The Battle for Your Mind*. McGraw-Hill.

Roheim, C. A., L. Gardiner and F. Asche (2007) Value of Brands and other Attributes: Hedonic Analyses of Retail Frozen Fish in the UK. *Marine Resource Economics*, 22, 239-254.

Train, K. (2003) *Discrete Choice Methods with Simulation*. Cambridge University Press.

S. Tveterås and R. Tveterås (2010). "The Global Competition for Wild Fish Resources between Livestock and Aquaculture", *Journal of Agricultural Economics*, vol. 61(2), pp. 381-397.



## Appendix: NSEC consumer surveys

Table X. Consumer surveys by country and species

	Brasil	Kina	Dominikanske republikk	Finland	Frankrike	Tyskland	Italia	Japan	Nederland	Norge	Polen	Portugal	Russland	Singapore	Spania	Sverige	UK	USA	Ukraina
Laks																			
Baccalao																			
Blåskjell																			
Kveite																			
Lodde																			
Lutefisk																			
Makrell																			
Reker																			
Sild																			
Sjømat																			
Torsk																			

Source: Norwegian Seafood Export Council

Table X. Consumer surveys by country and year

	Brasil	Kina	Dominikanske republikk	Finland	Frankrike	Tyskland	Italia	Japan	Nederland	Norge	Polen	Portugal	Russland	Singapore	Spania	Sverige	UK	USA	Ukraina
1999																			
2000																			
2001																			
2002																			
2003																			
2004																			
2005																			
2006																			
2007																			
2008																			
2009																			

Source: Norwegian Seafood Export Council

