NTNU

Norwegian University of Science and Technology

Master's degree thesis

AM521413 Master thesis – Discipline Oriented

An analysis of the demand for smoked salmon in France

Candidate number: 10020 & 10026

Even Fostervoll Langvatn & Kristoffer Laurits Urke Remø

Number of pages including this page: 123

Aalesund, 07.06.2018

Mandatory statement

Each student is responsible for complying with rules and regulations that relate to examinations and to academic work in general. The purpose of the mandatory statement is to make students aware of their responsibility and the consequences of cheating. **Failure to complete the statement does not excuse students from their responsibility.**

*Please complete the mandatory statement by placing a mark **in each box** for statements 1-6 below.*		
1.	**I/we hereby declare that my/our paper/assignment is my/our own work, and that I/we have not used other sources or received other help than is mentioned in the paper/assignment.**	☒
2.	**I/we herby declare that this paper** 1. Has not been used in any other exam at another department/university/university college 2. Is not referring to the work of others without acknowledgement 3. Is not referring to my/our previous work without acknowledgement 4. Has acknowledged all sources of literature in the text and in the list of references 5. Is not a copy, duplicate or transcript of other work	Mark each box: 1. ☒ 2. ☒ 3. ☒ 4. ☒ 5. ☒
3.	**I am/we are aware that any breach of the above will be considered as cheating, and may result in annulment of the examination and exclusion from all universities and university colleges in Norway for up to one year, according to the Act relating to Norwegian Universities and University Colleges, section 4-7 and 4-8 and Examination regulations at NTNU.**	☒
4.	**I am/we are aware that all papers/assignments may be checked for plagiarism by a software assisted plagiarism check.**	

		☒
5.	**I am/we are aware that The Norwegian University of Science and Technology (NTNU) will handle all cases of suspected cheating according to prevailing guidelines.**	☒
6.	**I/we are aware of the University's rules and regulations for using sources.**	☒

Publication agreement

ECTS credits: 30

Supervisor: Trond Bjørndal

Agreement on electronic publication of master thesis

Author(s) have copyright to the thesis, including the exclusive right to publish the document (The Copyright Act §2).

All theses fulfilling the requirements will be registered and published in Brage with the approval of the author(s).

I/we hereby give NTNU the right to, free of

charge, make the thesis available for electronic publication: ☒**yes** ☐**no**

Is there an agreement of confidentiality? ☐**yes** ☒**no**

(A supplementary confidentiality agreement must be filled in)

Date: 07.06.2018

Preface

After five years at NTNU Ålesund, we the writers, can look back at the time we dedicated here as an educational and exciting time with many fond memories. This thesis marks the end of our education, and it has been challenging, interesting, frustrating and highly rewarding. The topic chosen is based on our personal interests as well as feedback from relevant parties. We have been lucky enough to be situated in the middle of the industry through family and friends. Both of us consider the thesis to be the pinnacle of our time at NTNU Ålesund.

There are several people involved in making this thesis happen, and the helpfulness and kindness of the industry has overwhelmed us. Firstly, we would like to thank the Norwegian Seafood Council, especially Maria de Perlinghi and their Marketing Insight department for great help and input, as well as assistance with any data requirements. Furthermore, we would like to thank everyone willing to participate in the interviews for sharing their experience and knowledge with us. We would also like to thank NTNU Ålesund, particularly Erik Nesset and our supervisor, Trond Bjørndal. This thesis would not have existed without their patience, expertise, knowledge and constructive feedback. Lastly, we would like to thank our friends and family for all the support during our time at NTNU Ålesund.

Abstract

The objective of this study is to investigate the French market for smoked salmon. This is accomplished by regression analyses that includes import data from the UK, Germany, Poland, Denmark and Norway, in addition to domestic production in France. The time series is from 1995 to 2016. Further, this study examines how Country of Origin affects consumers purchase intentions regarding seafood, specifically cold smoked salmon, and Norway's position in relation to its competitors. The power balance in a smokehouse supply chain is discussed, and lastly Norway's position as a secondary processor in relation to the EU is elaborated and relevant barriers and possibilities are presented. Data collection is triangulated through both qualitative and quantitative studies. An OLS model is used to examine price, income and cross-price elasticities of demand, and five in-depth interviews in Norway and five in France are conducted to test the proposed framework and build a foundation for the research questions. The findings suggest that the French market for smoked salmon is both price and income sensitive and suggest fresh salmon fillet to have a substitution effect.

Abbreviations

B2B	Business to Business
B2C	Business to Consumer
CoO	Country of Origin
CSR	Corporate Social Responsibility
ECU	European Currency Unit
EUR	Euro
FRF	French franc
FTE	Full time equivalent
HOG	Head on gutted
NOK	Norwegian krone
NSC	Norwegian Seafood Council
RQ	Research question
WFE	Whole fish equivalent

Table of contents

List of figures

List of tables

1 INTRODUCTION

The purpose of this study is to analyse the demand for smoked salmon in France, and aims to investigate whether price, income and substitute products such as fresh salmon fillet has any effect on the demand through an OLS regression analysis. France has long been known as the gastronomic centre of Europe and studying the price sensitivity on a luxury product such as smoked salmon could lead to interesting findings. Seafood is an essential part of the everyday lives of French consumers. This is the largest consumer market and most sophisticated market for Atlantic salmon in the EU (Asche et al., 2011), and smoked salmon is the third most bought seafood product after fresh salmon and canned tuna (NSC France, 2016). In addition, France is the second largest market for smoked salmon in EU after Germany. The unique part of the market is the elevated level of domestic production compared to other European markets (Appendix 2), which covers close to 77% of the domestic market (EUMOFA, 2016b).

Demand analyses aim to provide quantitative estimates of the effects of change in the price for the studied product, in the price of the substitutes, and in consumer income on the demand for salmon products (Asche and Bjørndal, 2013: p. 131). There are few demand studies regarding smoked salmon in France, as most previous research is based on fresh Atlantic salmon and / or different contexts. Although it is possible to find a certain resemblance between the different demand studies on seafood in France in general, the findings of the industries will differ. As a result, it is of interest to investigate further what affects the demand for smoked salmon (RQ1).

The discussion of how Country of Origin affects French consumers could affect how Norwegian exporters position themselves in the market (RQ2). Several studies have been conducted on this subject and Country of Origin has received much attention in the literature in the past. Secondary sources as well as the results from the qualitative study will be used to give an overview of Norway's position in France as a Country of Origin for seafood, particularly for salmon.

Discussion of power within a supply chain in the secondary processing industry, both domestically and internationally, could lead to interesting findings on the power balance between the different parties involved (RQ3). Knowledge of the power relationships in the different parts of the supply chain could potentially give preliminary insight to all the relevant firms in the industry. It could also reveal interesting topics for future research.
Norway is the largest farmer of Atlantic salmon but has not been able to achieve the same development with smoked salmon or other processed salmon products. Currently, only 15 - 20 per cent of salmon is processed in Norway, where approximately 80 per cent of the processed products are fillets, either fresh or frozen (SINTEF / Kontali analyse, 2011). An increase in secondary processing domestically could potentially contribute to the increase of FTEs in Norway and position the nation as more than primarily a raw material nation. According to Hofseth (2017), companies that process fish generate approximately three times as much employment as those who focus solely on the raw material. Thus, it should be of interest to the industry, the nation as well as academia to study the barriers as well as how the current position can potentially be improved (RQ4).

Research questions

The research questions addressed are the following:
RQ1: How price- and income sensitive is the demand for smoked salmon in the French market?

Hypotheses

H1: The demand for smoked salmon is price-elastic

H2: The demand for smoked salmon is income-elastic

H3: Fresh salmon fillet has a substitution effect for smoked salmon

RQ2: Does country-of-origin have any effect on French consumer choices?

RQ3: How is the power relationship between supplier and buyer?

RQ4: How can Norway as a high-end seafood processor be more competitive in a large European market such as France in the smoked salmon industry?

Secondary data from the Norwegian Seafood Council (NSC) and EUMOFA is used as the foundation for the regression analysis. NSC has collected the data from the relevant countries' trade statistics. The qualitative research is conducted through in-depth interviews with five Norwegian exporters, both processors and farmers, as well as five French companies, covering a large part of the supply chain. Furthermore, secondary data, literature and reports will provide the basis for interpreting the research questions.

Structure

The thesis is structured as follows. First, the background chapter is presented, giving insight to the past and present economic situation, the demographics, in addition to the position of seafood, Atlantic salmon, and smoked salmon. A brief introduction to the French and Norwegian processing industry is then presented. Secondly, the relevant theory for the thesis is shown, giving insight into consumer behaviour, Country of Origin, power in a supplier / buyer scenario, demand functions, and niche marketing. Afterwards, the methodology employed will be elaborated to provide an analysis that reveals the formation of the findings systematically. Further, the results from the qualitative and quantitative studies are presented. The findings will then be discussed in accordance to theory, followed by limitations and further research. Lastly, a conclusion is drawn.

2 BACKGROUND

This chapter aims to give the reader a preliminary insight into the French market. First, the economic development and demographics are presented, before the seafood market, salmon and smoked salmon market in France are explored. Lastly, the Norwegian and French processing industries are presented.

2.1 Economic development

France is a major economic nation worldwide. After World War II, France experienced economic development for almost thirty years, known as the "thirty glorious years". However, this ended in the 1970s because of the oil crisis. The country struggled for some time but has rebuilt its economy and is now one of the four leading economies in Europe. Further, services from industries accounts for about 25 per cent of the GNP. In addition, the country is a self-sufficient and a major agricultural nation. France has been struggling with unemployment, especially among the youth. To improve this, France converted from FRF to EUR, as well as attempting to create a freer market by deregulating some of their major industries in the early 2000s (everyculture, 2001). In recent time, unemployment has remained an issue. Improving the economy of the country is vital and attempts such as making reforms to cut business and capital income taxes are aimed at increasing economic growth. The intention is to do this in a sustainable way that preserves education, training and infrastructure, as well as benefiting lower-income households. Additionally, the goal is to improve businesses and create more jobs (OECD, 2017). Variables presented in this chapter include GDP and inflation. The economic development of France will be further investigated as income is analysed with relevance to demand for smoked salmon later in this paper.

The economic structure of France changed after World War II. The northern and north-eastern areas of France were the most industrial and developing parts of the country until a shift happened in the 1980s. These regions suffered from unemployment; at the same time the population started to grow in the southern parts of France. As a result, regions in the south and west of France started to create more jobs and be involved in the economy to a greater degree. The private sector has been dominant compared to the public sector, but the country has still been able to organise a mixed economy. Further, living standards increased during past decades in terms of households with a reduction in working hours per week, in addition

to increases in house ownership and consumer goods. France and its citizens have relatively high taxes compared to other European countries, which contribute to monetary benefits for the citizens. (Wright and Weber, 2017). Figure 2.1 shows annual GDP in USD from 1960 to 2016.

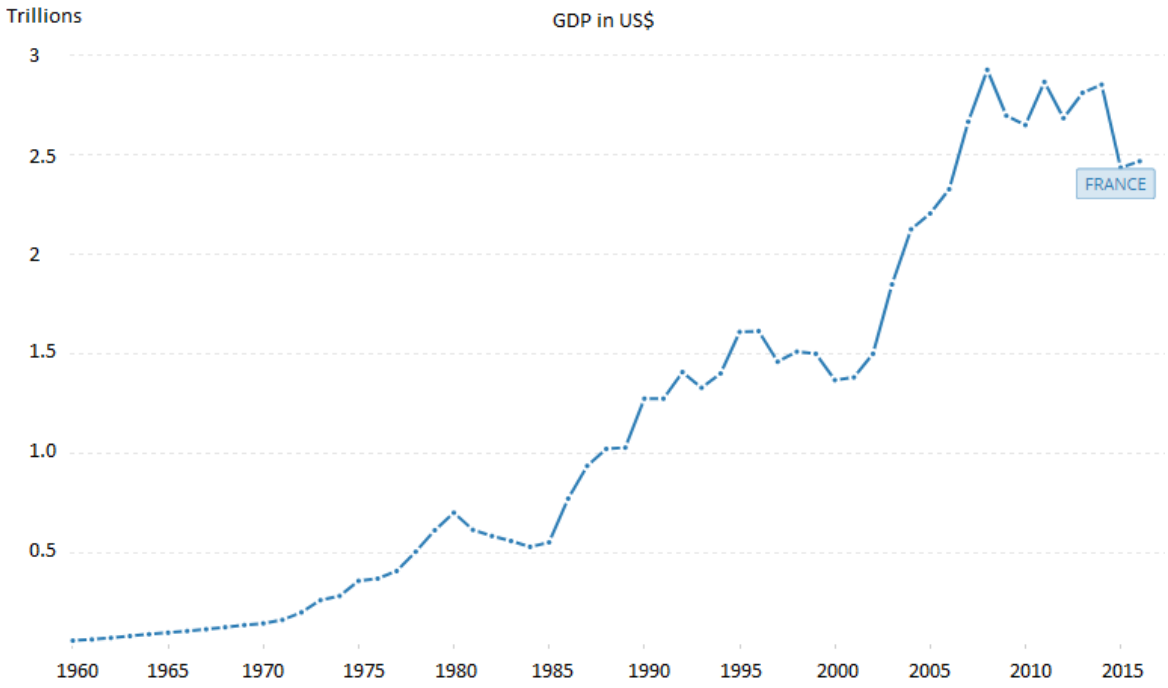


Figure 2.1: GDP from 1960 – 2016

Source: *World bank (2018)*

Figure 2.2 shows annual growth in GDP in percentage from 1960 to 2016. During the "thirty glorious years", post-World War II, France had a high and steady annual GDP growth ranging between four and six per cent. Because of the oil crisis in the 1970s, growth rates decreased substantially in addition to a moderate increase in unemployment. A decade later, the economy of France started to improve, but at a more natural and lower rate going into the 21st century. France experienced three huge drops in annual GDP growth from the 1960s to 2016, shown in Figure 2.2. The first drop was the oil crisis in the 1970s, which affected the French economy negatively, but made them start the process of rebuilding their economy only a few years later. The next big drop was due to a financial crisis in the early 1990s. Similarly, a financial crisis occurred in 2008 and had an effect on the annual GDP growth. As a result, the GDP growth rate in 2009 was the lowest registered between 1960 and 2016 (Wright and Weber, 2017).

Figure 2.2: Annual GDP growth in percentage from 1960 - 2016

Source: World bank (2018)

The Government has privatised multiple large companies, and is present in sectors such as power, public transport and defence industries. This makes the French economy diversified. In addition, France has the third largest income worldwide from tourism, and is the most visited country in the world. As the youth unemployment increased between 2008 and 2012, the French economy was affected negatively. The budget deficit increased from 3.4% to 7.5% of GDP from 2008 to 2009 but improved to 4.8% of GDP in 2012. The Government aimed to bring the budget under the 3% euro-zone ceiling by 2013 due to all the debt after the financial crisis in an intensified regulated financial market. Francois Hollande won the presidential election in 2012, mainly because of discussions about economic growth policies. Over a five-year period, 60,000 teachers were supposed to be hired, as well as an attempt to implement a 75% wealth tax for those who had more than one million euros in annual income. The wealth tax did not go through, but France and Hollande's Government achieved a deficit target of 3% of GDP during 2013 although the economic growth was lower than expected (NationMaster, 2014). The annual GDP growth per capita from 1960 to 2016 is shown in Figure 2.3.

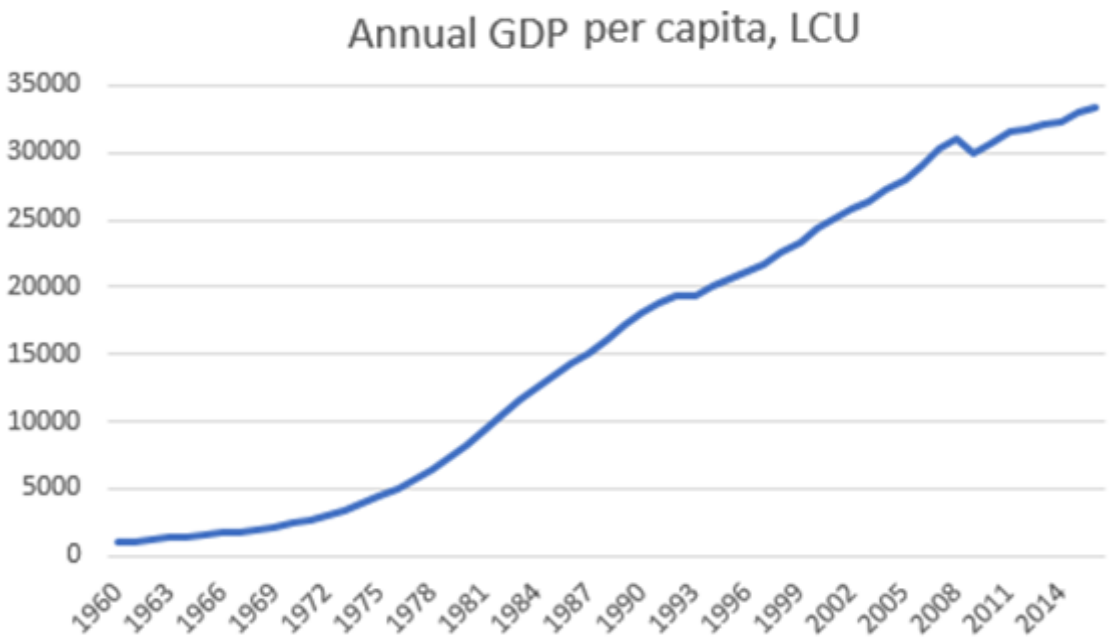


Figure 2.3: Annual GDP per capita from 1960 - 2016.

Source: *World bank (2018)*

According to Figure 2.4, the inflation level was rather high after the oil crisis in the 1970s and started to normalise in the mid-1980s. The drastic change in inflation resulted in France making a turn and letting the German Bundesbank control its monetary policies due to intractable inflation. France focused on full employment, which affected price stability. Furthermore, the goals and methods were replaced in the 1990s by inflation targeting, which was managed by independent central banks. This resulted in greater stability, although the unemployment rate was high (Persson, 2015).

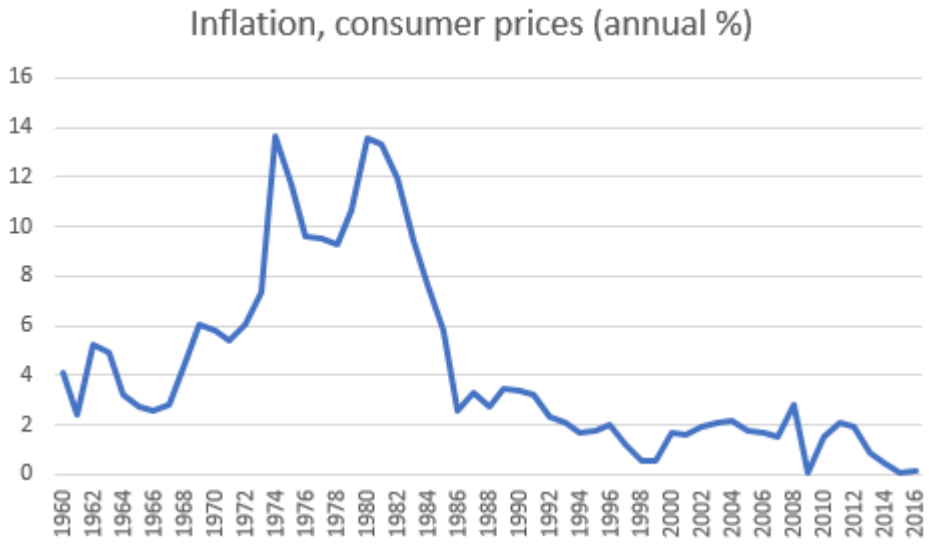


Figure 2.4: Inflation, consumer prices from 1960 - 2016

Source: World bank (2018)

2.2 Demographics

This chapter describes the demographics of France. First the population is presented (Figure 2.5), where the age distribution is highlighted. This is related to the potential market for smoked salmon. Furthermore, the unemployment rate of the country is shown, related to the income of the consumers. France is the largest Western European country in terms of area and has faced a tremendous increase in the population over the last 20 years. It is a multi-ethnic country and the population is diversified by ethnicity, region, generation, politics and social class. Immigrants mainly come from parts of Northern Africa and Portugal, in addition to an increase in immigrants from Eastern Europe (everyculture, 2001).

France was the most populated European country in the early 19th century. Because of wars in the 19th century, as well as World War I and World War II in the 20th century, the population growth suffered a decline. In 1938, France offered numerous benefits to families with children in an attempt to change the trend; this appeared to be a rather effective policy. Post-World War II, baby boom years occurred as the soldiers came home to their families, along with a high immigration rate. The birth rate slowed down from the 1970s, but as the living standards improved a decade after the oil crisis, the life expectancy increased. The total

population grew steadily into the 21st century, and the population increased by approximately 40 per cent from 1960 - 2016 (Wright and Weber, 2017).

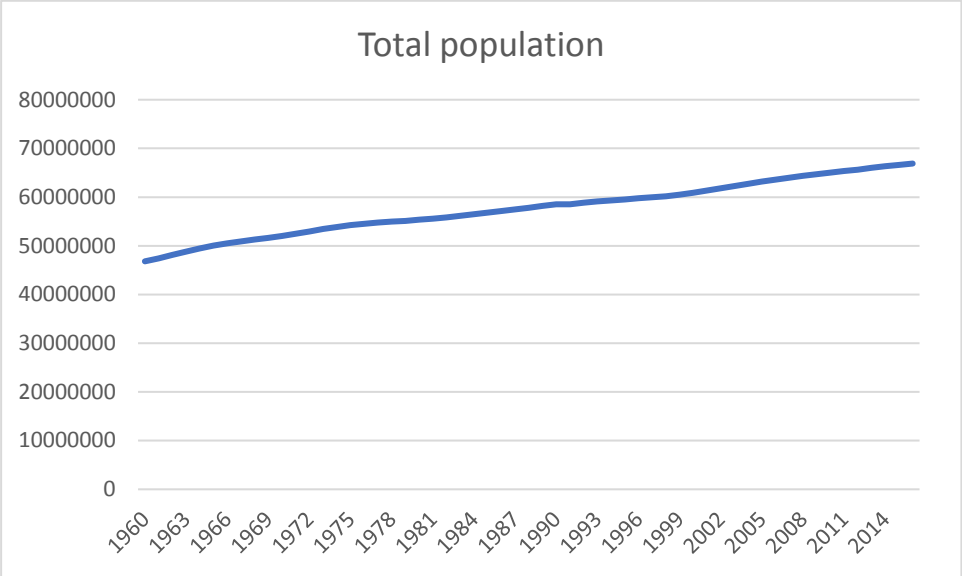


Figure 2.5: Total population from 1960 – 2016

Source: World Bank (2018)

As the average age of the population increases it is common that the birth rate decreases. See Figure 2.6 for the distribution of population aged 65 and above. This is normal in Western Europe, with medical advances leading to longer life expectancy. The population is expected to work longer which influences the economy positively. A factor to consider is that the ageing population could increase the demand for healthier products. Expectancies of higher education and healthier lifestyles are set, resulting in higher demand for fish protein - not only in France, but worldwide (Lem, Bjørndal and Lappo, 2014). As people get older, they tend to consume more seafood, and have less budgetary restraints and better cooking skills. As a result, the consumers have more time for healthy cooking as it becomes trendier and more information is available than in the past (NSC France, 2016). In addition to having an aging population, women tend to outlive men, which results in more women in the job market (Wright and Weber, 2017).

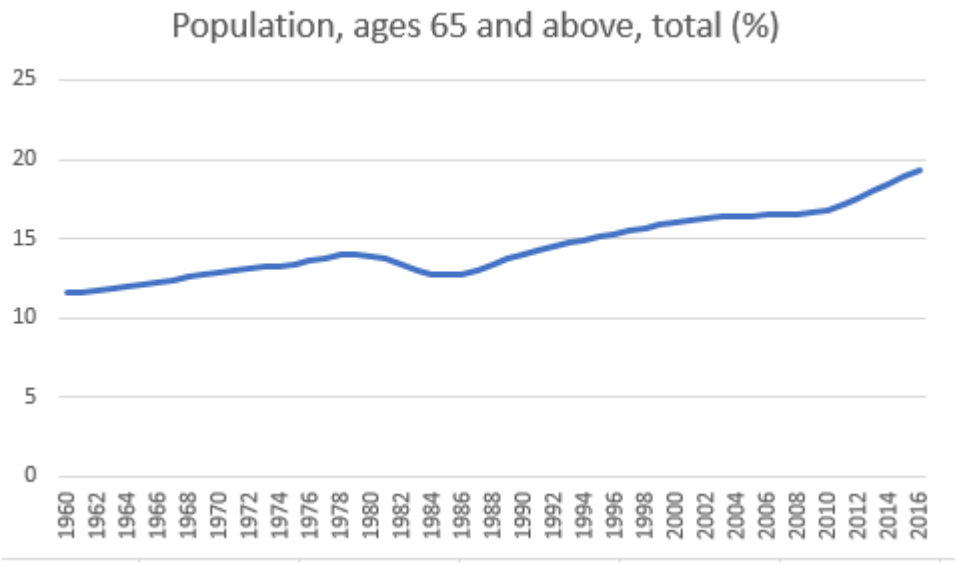


Figure 2.6: Population, age 65 and above from 1960 - 2016

Source: World Bank (2018)

Unemployment in France has been an issue for a long time, and the financial crises and oil crisis has worsened the unemployment rate as shown in Figure 2.7. High labour taxes, growing gaps in skills and wages, as well as continuous and elevated economic uncertainty is further increasing the gaps. Unemployment in France is more of a structural phenomenon than a cyclical one, as the unemployment rate has increased steadily for several decades in a row. The high unemployment rate averages more than twice of that in Germany and the UK among young people. Further, the structural unemployment is worsened by the increase in unemployed citizens. From the financial crisis in 2008 to 2016, the number of job-seekers increased by 135% for a period between one and three years. Vicious cycles may appear, and the longer a citizen is unemployed, the harder it is to find a job. Structural reforms can potentially increase the ability and incentives to find jobs and reduce the duration of unemployment (International Monetary Fund, 2016).

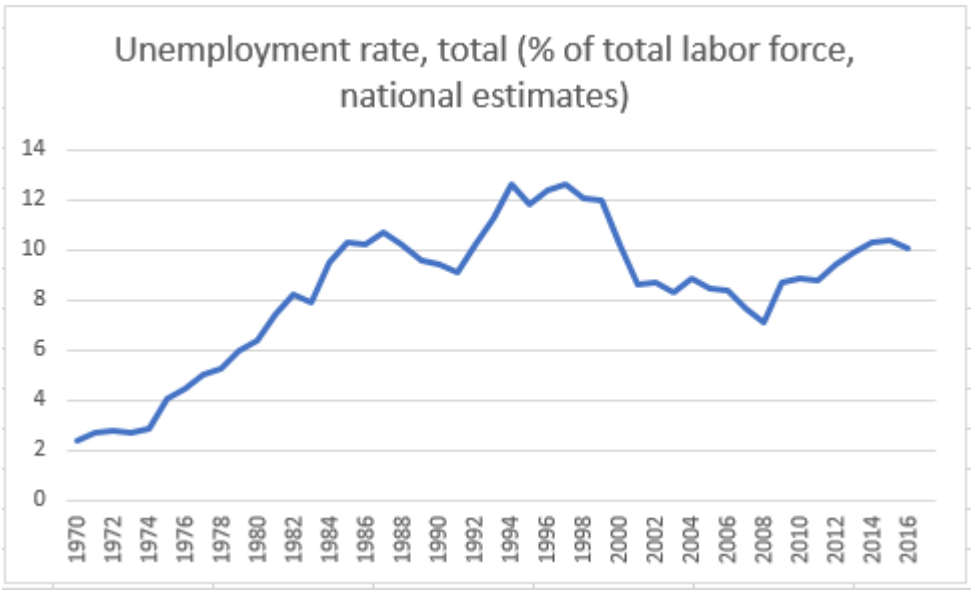


Figure 2.7: Unemployment rate from 1970 - 2016

Source: World bank (2018)

2.3 Seafood

French cuisine is arguably one of the most famous in the world, and seafood is a central part of this. As shown in Figure 2.8, Portugal is the leading consumer of seafood in Europe, closely followed by Norway. The annual seafood consumption per capita in France is 34 kg (FAO, 2018a), and 97% of the consumers say they eat seafood. Furthermore, four out of 10 French consumers say they consume seafood more than twice a week (NSC France, 2016).

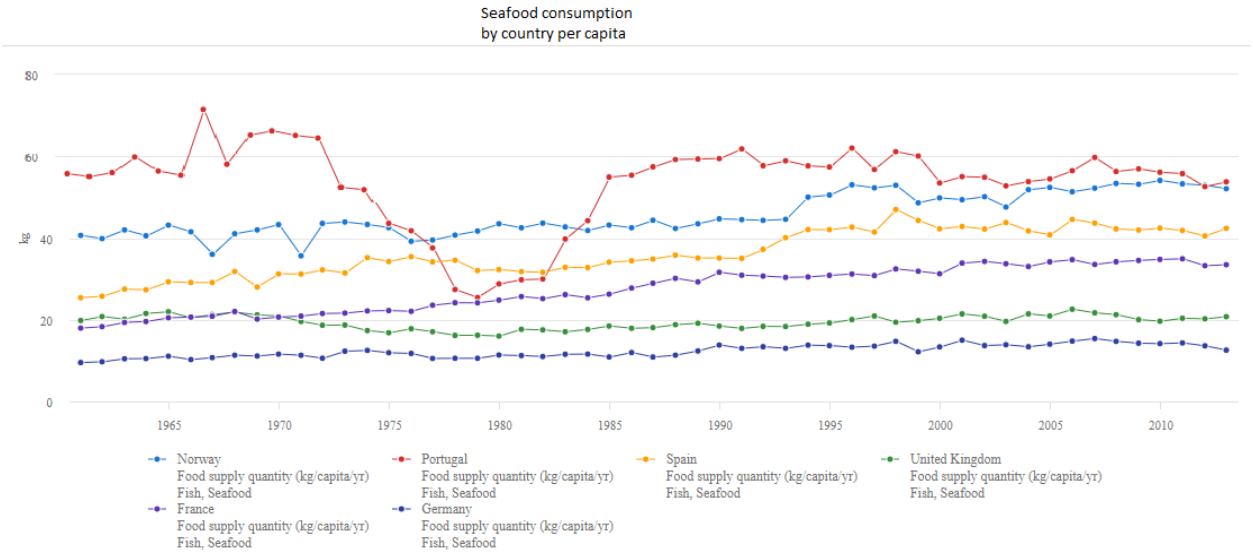


Figure 2.8: Seafood consumption by country per capita

Source: FAO (2018a)

France has a coastline of 18,400 km with a fishing fleet of approximately 7,100 vessels. The French marine sector employs about 16,800 fishermen. In 2014, first sales on French landed seafood totaled approximately 207,600 tonnes (EUMOFA, 2016b). In 2016, the total import and production of seafood in France was 551,820 tonnes. Norway exported 29.4% of the supply directly and 17.4% via hubs. Other countries accounted for 42.7% of the supply, and France produced approximately 10.4% on its own. In addition, 11.3% of seafood in France was exported to other countries (Appendix 1). Figure 2.9 shows the total value and volume of the exported seafood from Norway to France from 2014 to 2017. The last few years has seen record high prices for both salmon (Framstad, 2018) and cod (Norges Sjømatråd, 2017), which could explain the skewed distribution shown in Figure 2.9.

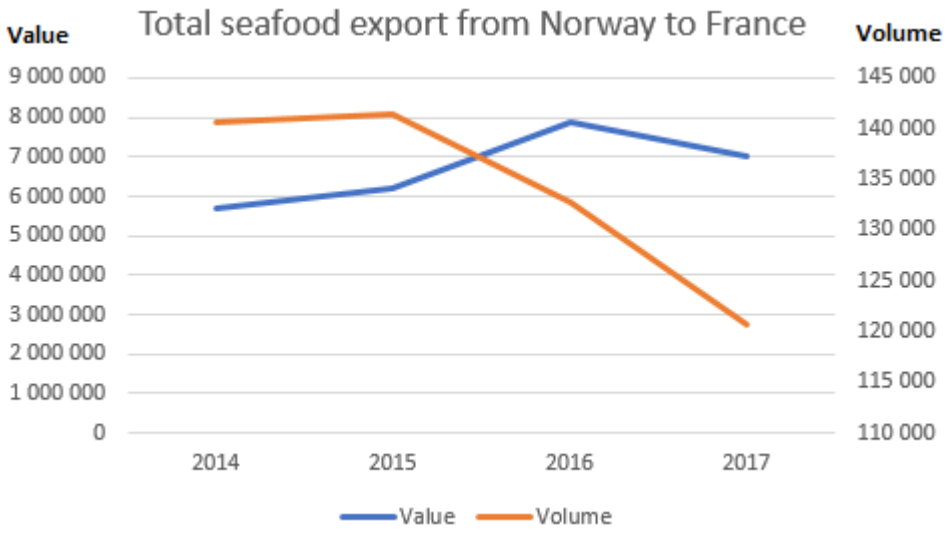


Figure 2.9: Total seafood export from Norway, volume in tonnes and value in million NOK

Source: *Seafood.no (2018)*

France is the third largest importer of Norwegian seafood (120,764 tonnes), after Poland (195,953 tonnes) and Denmark (394,093 tonnes) (Seafood.no, 2018). Both Poland and Denmark import large volumes of seafood from Norway with the intention of processing the raw material and re-exporting the finished product (Eurostat, 2012). Figure 2.10 illustrates the preferred seafood species if the respondents eat outside of home.

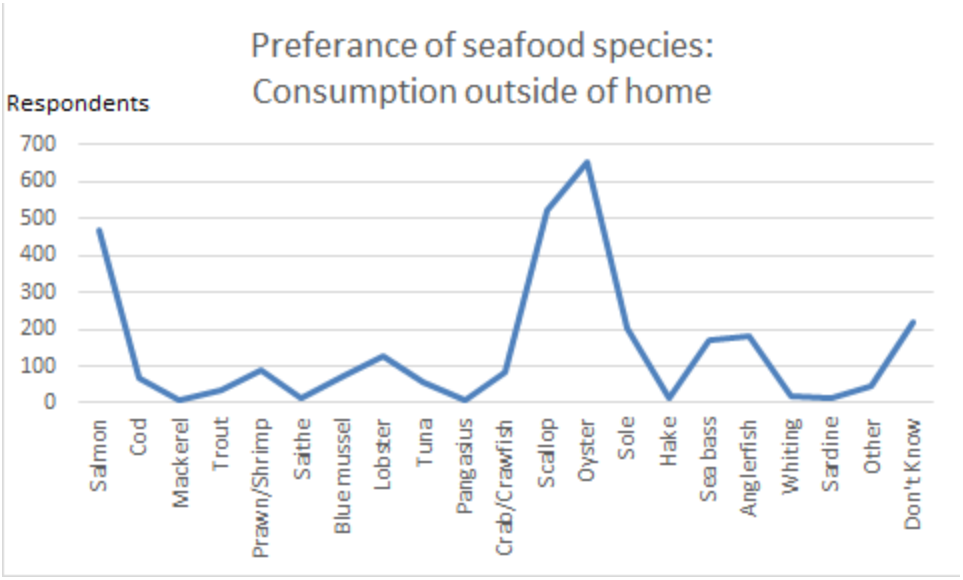


Figure 2.10: Consumption outside of home

Source: NSC (2017)

According to NSC France (2016), the younger consumer segment in France has an increasing consumption frequency out of home, while the older part of the population has been at a stable level the five years accounted for in the survey (Figure 2.11). The most preferred species are salmon, scallop and oyster, which is shown in Figure 2.10.

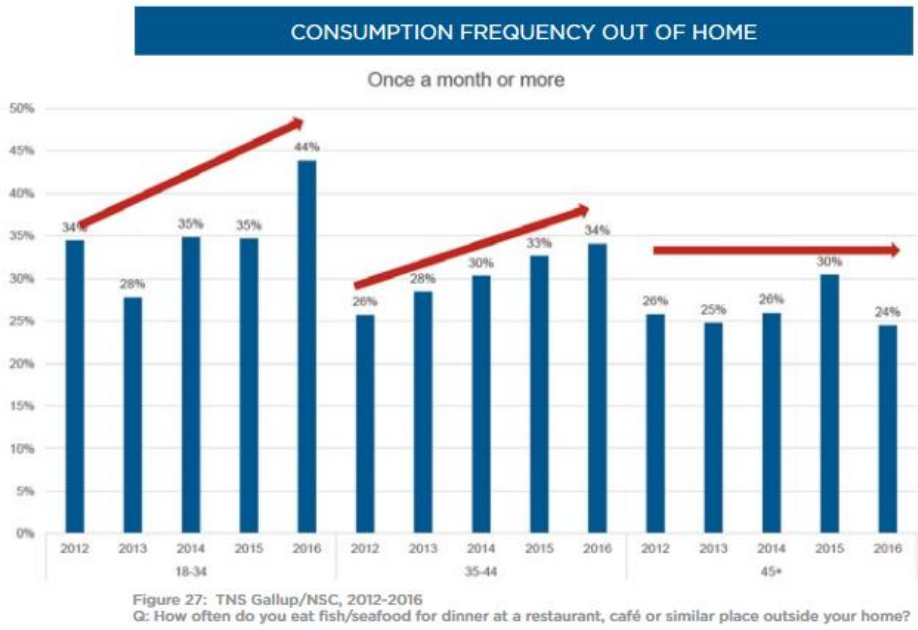


Figure 2.11: Consumption frequency out of home

Source: (NSC France, 2016)

Figure 2.12 shows the distribution of seafood for household consumption. Tuna is the most bought species in volume, either prepared or canned. Salmon is the second most consumed species at home and is bought in a variety of product types, where smoked and fresh salmon are the two most popular products. Cod has some diversity as well, and prepared and fresh is the most commonly consumed. Ninety per cent of the mussels are bought fresh, and 81% of the prawns are consumed prepared, usually peeled and "ready to eat".

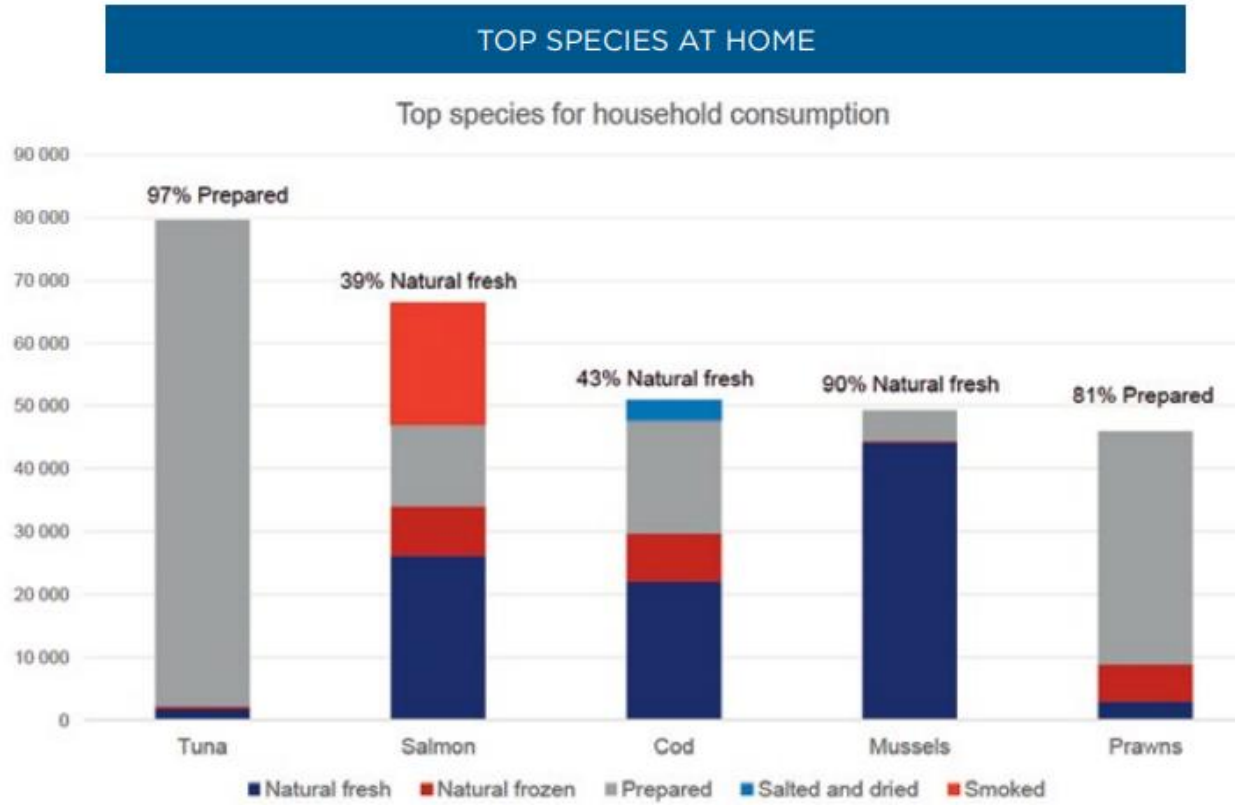


Figure 2.12: Top species consumed at home

Source: *NSC France, 2016*

2.4 Salmon

Salmon is generally considered as a high-quality food globally (SINTEF Fiskeri og havbruk AS, 2014). Norway accounted for close to half of the world's production of Atlantic salmon (Salmo salar) in 2016 (Marine Harvest, 2017), and the EU remains the most important market

for salmon worldwide, with a total export of 674,099 tonnes of fresh Atlantic salmon in 2017 (Seafood.no, 2018, Figure 2.13). In the EU, France is the largest and most sophisticated Atlantic salmon market with the largest variety of product forms (Asche et al., 2011). According to Kontali / Eurofish (2017b), France imported a total of 177,740 tonnes of Norwegian salmon (WFE) in 2016, where 43,270 tonnes (WFE) went through different hubs such as Poland, Denmark, Ireland, or Germany. The remaining 134,470 tonnes of salmon were exported directly from Norway. In addition, France consumed about 188,520 (WFE) tonnes this year.

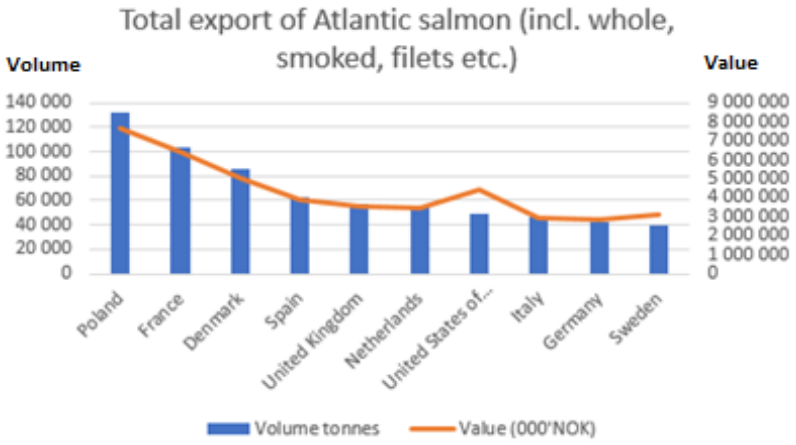


Figure 2.13: Total export of salmon from Norway 2017 (incl. whole, smoked, fillets etc).

Source: Seafood.no (2018)

France has some domestic farming of trout, but the volume is not comparable to other aquaculture nations. The farms are mainly located in Normandy and Bretagne regions (FAO, 2018b), and the farms produced approximately 50 tonnes (WFE) in 2016 (Kontali / Eurofish, 2017b).

Generally, the Atlantic salmon market is industrialised, well-analysed and volatile. The fluctuations in supply and demand, as well as global trends, will affect the price point of Atlantic salmon (Nasdaq, 2018). The industry distinguishes between Superior (sup.) quality, Ordinary (ord.) quality and Production (prod.) quality (Salmon.fromnorway.com, 2018), where salmon of prod. quality might have wounds in the skin, melanin spots or other faults. By law, the prod. quality salmon cannot be exported before the fault has been corrected to maintain the image of Norwegian salmon worldwide. This fault can often be corrected through processing and the affected salmon can thus be exported. (SINTEF / Kontali Analyse,

2011). Figure 2.14 indicates the price generated per kg through the FishPool Index and volume exported.

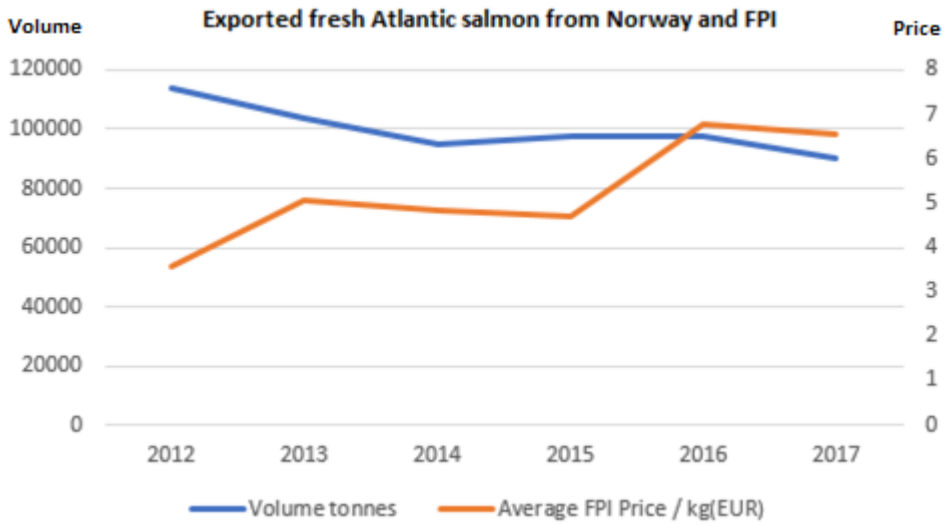


Figure 2.14: Exported fresh salmon France - Volume in tonnes, price in EUR / KG

Source: FishPool and Seafood.no

2.5 Smoked salmon

After fillets, smoked salmon is the most common secondary processed product based on Atlantic salmon (Marine Harvest, 2016). Smoking, besides drying, is historically the oldest way of preserving a meat or fish (Løvdal, 2015.) During the middle ages, a long salting period and an extensive smoking period of the smoked fish would yield significantly better preservation. Today, however, the fish is primarily smoked to give it an appealing appearance, a delicate aroma and for the taste (Pedersen, 1981: p. 157). There are fundamentally three stages of cold smoking which contribute to preserving the salmon: salting, dehydration and smoking (Løvdal, 2015). Cold smoked salmon, which will be the main area in this study, is smoked at 17ºC to 22ºC, whereas hot smoking is a cooking-smoking process and the temperature of the fish should be above 80ºC (Pedersen, 1981). Figure 2.15 gives an overview of the process of smoking salmon.

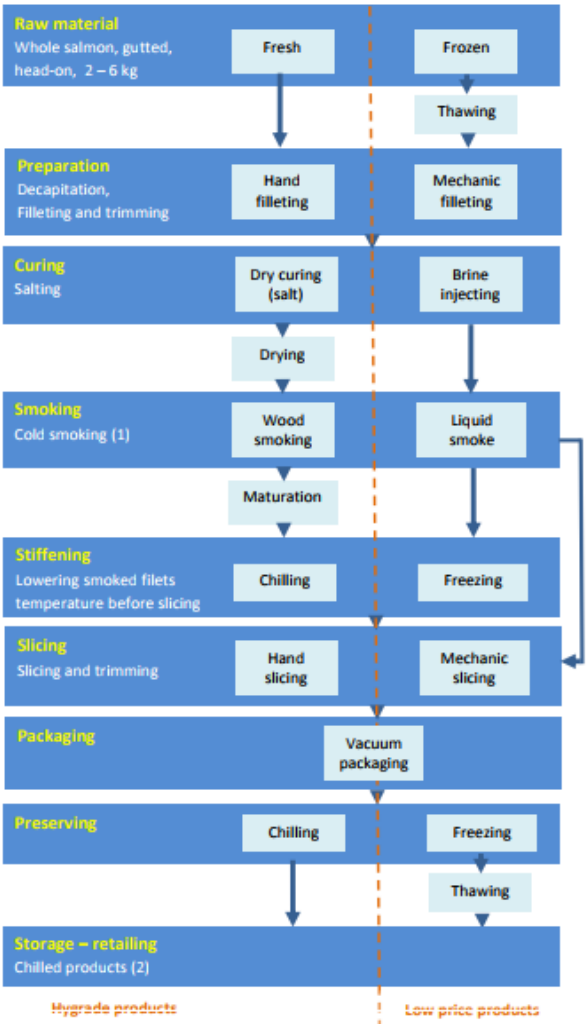


Figure 2.15: Processing steps in cold-smoking salmon production

Source: EUMOFA, 2016a

In terms of the French market, smoked salmon is considered a delicacy, and is considered in the same category with other cured and smoked meats throughout the year. In the festive seasons, such as Christmas and New Year, it is accompanied by products such as foie gras and oysters (EUMOFA, 2016a). Smoked Atlantic salmon of different origins represented 85% of the total volume sold by French retailers in 2015, while the other 15% was from Alaska and other origins in the Pacific. Smoked salmon with Norwegian Atlantic salmon as the main raw material is the largest market segment by origin for French retailers and held a market share of 39-45% of the total import in 2010-2015 (EUMOFA, 2016a). Most of the raw material is likely to be processed somewhere other than Norway. There has been a decrease in market share the past years due to several issues according to French consumers in 2013. The reasons for this are high prices at retail levels, CSR and environmental issues, bad publicity

through media, and marketing investments focused on the French processor rather than Norway as a CoO (EUMOFA, 2016a).

Rustad (2005: p. 6) argues there is a seasonal effect on salmon; especially smoked salmon. According to SalmonBusiness.com (2018), 47% of the French planned to consume smoked salmon during the holiday season. This is also evident from the import statistics in Figure 2.16, which excludes domestic production.

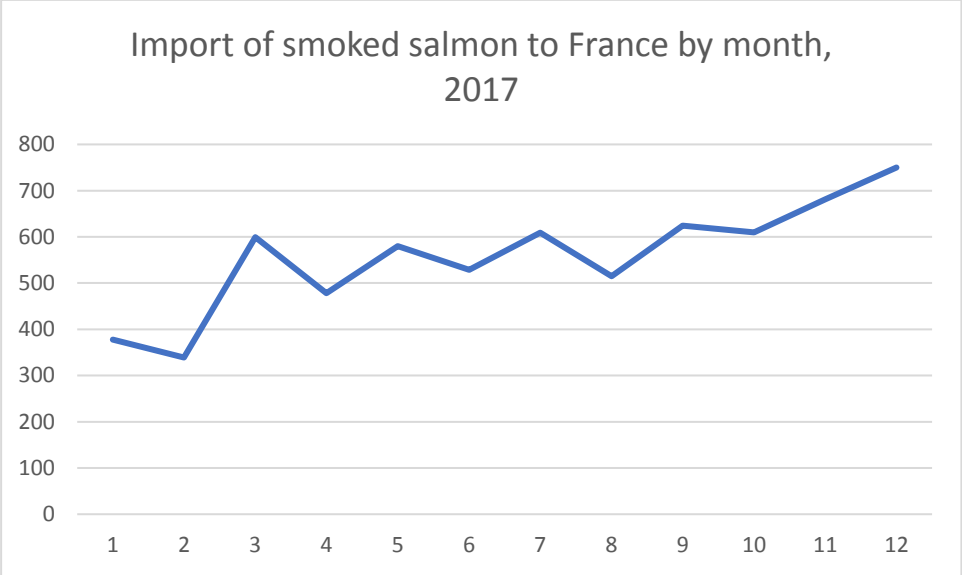


Figure 2.16: Import of smoked salmon to France by month in 2017, volume in tonnes.

Source: NSC, 2018.

There are two main reasons why the French consumers choose smoked salmon; convenience and indulgence (Seafood.no, 2017). France has a well-established smoking industry, and is Europe's second largest producer, only beaten by Poland. In 2014, France produced a total of 32,780 tonnes of smoked salmon / trout (Eumofa, 2016a). In this context, the producers import either fresh or frozen Atlantic salmon (salmo salar; gutted, head on) from producing countries, primarily Norway (two thirds of the supply in 2014), and smoke the salmon domestically. Ninety-five per cent of the supplied salmon for the European processing industry is farmed Atlantic salmon (Eumofa, 2016b).

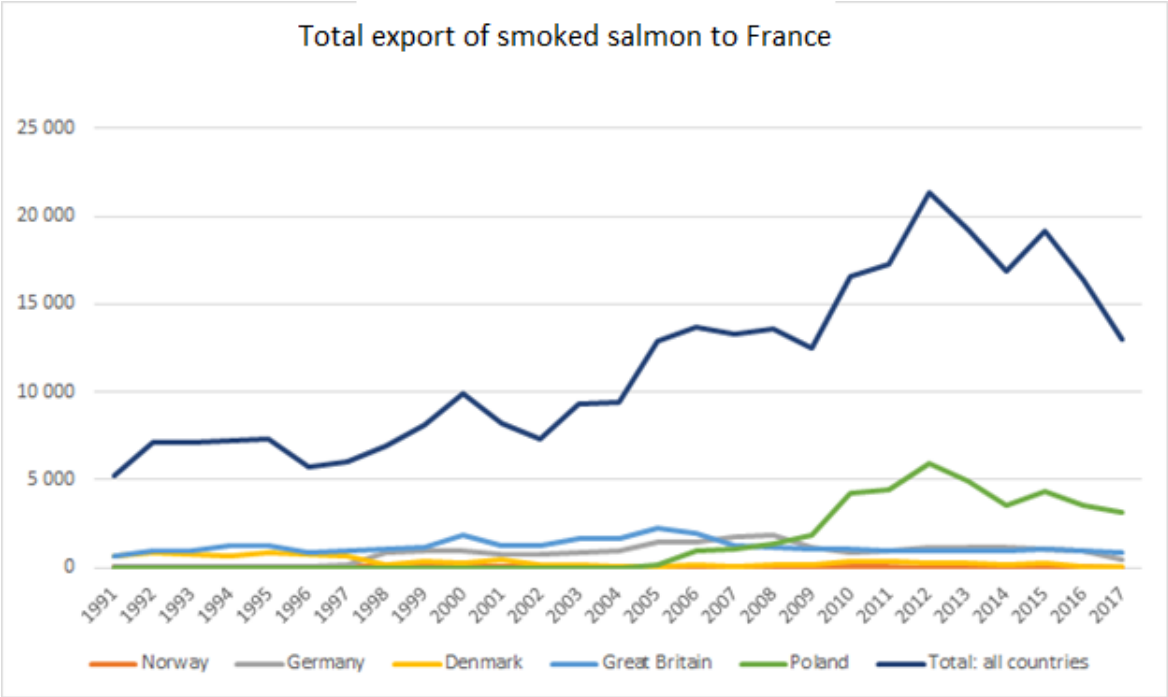


Figure 2.17: Export of smoked salmon to France, volume in tonnes

Source: Each country's trade statistics & Eurostat.

Export and import data seem to have certain differences. For example, Norway reported significantly lower exports (3 tonnes) in 2017 than France reported imports from Norway (251 tonnes). This could be due to the use of hubs, as explained earlier. The rather low export to France from Norway will be discussed later in the paper. According to FranceAgriMer (2016), the four most common types of distribution channels for the consumers to buy smoked salmon are supermarkets, fishmongers and markets, restaurants and institutional catering. The French retail industry is important in the industry as most smoked products are sold in supermarkets.

2.6 The Norwegian processing industry

Norway is the most important supplier of seafood to the EU. Raw materials are used in the processing industry and represent a considerable share of the imports (Regjeringen, 2016). By looking at the export data for France (Figure 2.17), smoked salmon produced in Poland seems to have the greatest market share. A common scenario is that a producing country such as Norway may export the raw materials to a low-cost country, where the salmon will be processed and sold to other countries. The products go through multiple links before ending

up at the final destination. An example is large integrated farmers establishing smokehouses in Poland due to cheaper labour, lower tariffs and market closeness (Doyle, 2016). Only 15 to 20 per cent of salmon is processed in Norway, and 80% of the products are fillets, either fresh or frozen (SINTEF / Kontali analyse, 2011). There are several factors related to Norway currently being primarily a raw material nation, and among these are the high salaries, fees specific to the Norwegian marine and aquaculture sector, as well as trade barriers (Henriksen and Bendiksen, 2008)

In 2013, processing of salmon and trout accounted for close to 3,900 FTEs, which is more than 35% of all employees in the Norwegian seafood industry (Nærings- og fiskeridepartementet, 2012). There are currently 59 slaughterhouses in Norway, and 14 of these perform secondary processing such as smoked salmon (Mattilsynet, 2018). Most of the slaughterhouses are integrated with farmers, but there are independent slaughterhouses that operate on contract. (SINTEF Fiskeri og havbruk AS, 2014). Figure 2.18 shows the distribution of secondary processing (SINTEF / Kontali Analyse, 2011). Norway has a production of approximately 10,000 tonnes HOG smoked salmon (Hustadnes, 2018) annually, which can be calculated to 6,400 tonnes product weight[1] using the conversion rate of 0.54 (Marine Harvest, 2017, Appendix 6a). Roughly 40% of the volume is exported (Seafood.no, 2018).

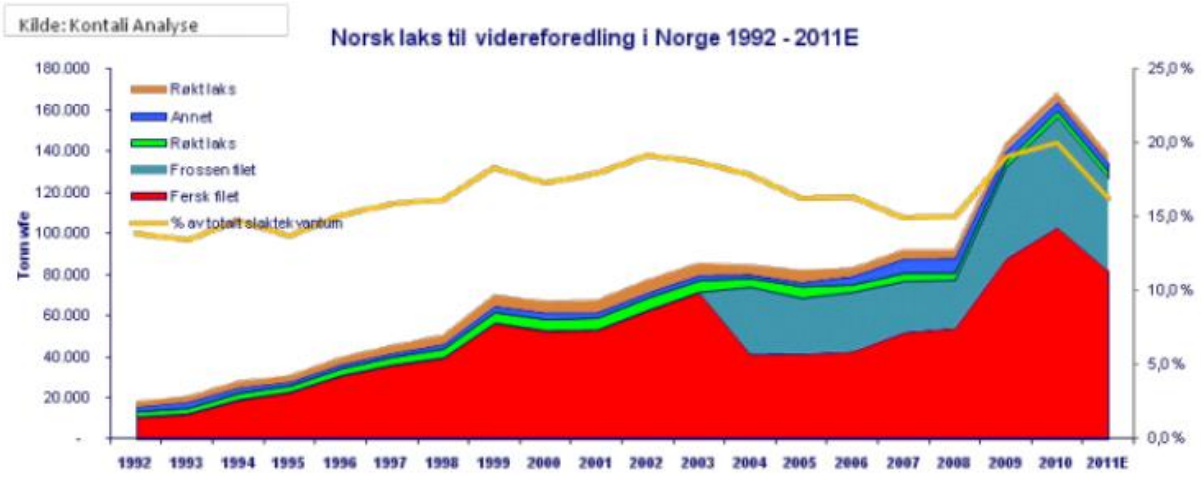


Figure 2.18: Processing of salmon in Norway

Source: SINTEF / Kontali Analyse, 2011

[1] (10,000 / 0,84 = 11,900 tonnes live fish. 11,900 * 0,54 = 6,400 tonnes product weight)

2.7 The French processing industry

The French processing industry is a traditional industry that experienced high growth during the 1980s, as the industrialisation of farmed Atlantic salmon and lower prices lead to an attractive product. For some years, the quality varied as injecting brine and smoke flavour became common, which resulted in significantly lower prices. After this, extensive consolidation took place, and the industry has recovered its reputation (Asche and Bjørndal, 2013: p. 87). There are several large actors located in France, such as Labeyrie, Intermarché, Delpeyrat and Marine Harvest (Marine Harvest, 2017, Figure 2.19). Seventy-seven per cent of the domestic market is covered by the French domestic production of smoked salmon, and generates a portion of exports (Eumofa, 2017b).

Estimated Annual Raw Material - Tonnes HOG			
70 - 90 000	20 - 40 000	10 - 20 000	5 - 10 000
MH Consumer Products (PL-FR-UK)	Labeyrie (FR-UK) Lerøy (NL-SE-NO)	Norvelita (LT) Mer Alliance (FR) Suempol (PL) Delpeyrat (FR) Young's Seafood (UK)	Martiko (ES) Friedrichs (DE) Neptune Intnl. (DE) Intermarché (FR) Foppen (NL) Ubago (ES)

Figure 2.19: European smoked salmon producers

Source: Marine Harvest (2017)

Kontali (2017b) estimate the total production of smoked salmon in France, using Norwegian salmon as the raw material, to be 80,162 tonnes (WFE). Using the conversion factor of 0.54 (Marine Harvest, 2017, Appendix 6a), we can calculate the product weight to be 46,545 tonnes [2]. The total export of French smoked salmon with Norwegian salmon was 9,548 tonnes (WFE). The volume in product weight is 5,544 tonnes. Thus, most of the French produced salmon is likely to be consumed in the domestic market and is calculated to be approximately 80%.

Norway does not have free trade terms with the EU for fish. Measured in value, the share of seafood exports that is taxed in the EU from Norway is approximately 70%. The total tariff burden is between 700 million NOK and 1,1 billion NOK annually, dependent on the use of the available tariff-free quotas. Fresh and frozen salmon sold to countries in the EU have a

[2] (80,162 / 0,93 = 86,196 tonnes live fish. 86 196 * 0,54 = 46,545 tonnes fillet, skin off).

two per cent tariff rate, while processed fish such as smoked salmon has a 13 per cent tariff rate. Therefore, processed fish is affecting the Norwegian production structure, as well as merchandising with the EU to a greater degree than raw materials (Regjeringen, 2016).

Norway has a tax-free quota of 450 metric tonnes of smoked salmon. When this quota is reached, the MFN (Most Favoured Nation) tax of 13% is then applicable (Seafood.no, 2018). The incentive for this tax by the EU is to protect and stimulate their own processing industry (SINTEF Fiskeri og havbruk AS, 2014). Table 1 shows which date the tax-free quota has historically been reached. The earliest the quota has been spent is 20th August, 2009, and the latest is 17th December, 2012. In 2014 and 2015 the full quota was not used, and thus, the smoked salmon was exempt from tax.

Year	Date when EU tax free quotas are spent
2017	24.nov
2016	04.des
2015	9 TONS LEFT
2014	32 TONS LEFT
2013	24.nov
2012	17.des
2011	08.okt
2010	29.okt
2009	20.aug
2008	24.sep
2007	27.aug

Table 1: Tax-free quotas on smoked salmon spent, from 2007 to 2017

Source: Norges Sjømatråd, 2018b

3 THEORETICAL FRAMEWORK

The theoretical framework presents relevant literature that will be the foundation for the discussion chapter. First, theory about consumer behaviour, CoO, image and other factors affecting the decision-making process will be presented. Accordingly, multiple parties are involved in the smoked salmon industry from producing the product to selling it to the final consumer. Therefore, it is of relevance to investigate power theory related to buyer and supplier. The next topic will illustrate different equations and theories about price elasticity. Lastly, niche marketing is presented.

3.1 Consumer behaviour

According to Pindyck and Rubinfeld (2013: p. 67), consumer behaviour describes how income among various goods and services is allocated with an aim to maximise the consumers' well-being. Changes in both prices and income affect the demand; in addition, product sensitivity is an important and diverse factor that must be considered. Purchasing decisions are not always made rationally, but sometimes rather impulsively although there are budget restraints. Friends and family, in addition to current mood, may affect purchasing decisions and preferences.

Consumer preferences

A list of specific quantities of one or more products can be referred to as a market basket. To understand consumer purchasing decisions and preferences, it is of importance to understand the mind-set of consumers. Pindyck and Rubinfeld (2013: p. 69) argue that there are some basic assumption affecting preferences. First, completeness about baskets means that consumers can rank and compare their possibilities. In addition, the alternatives may be indifferent, meaning that one will be equally satisfied with either basket. Second, transitivity describes the importance of consistency in preferences related to ranking. One will always prefer the best ranked basket. The last assumption is volume. It is desirable to have more of any product than less. A comparison of different baskets can be shown graphically in an indifference curve, represented by a utility function (Pindyck and Rubinfeld, 2013: p. 70).

Budget constraints

The element of consumer behaviour and preferences has been in focus, but another element in this theory is budget constraints. Consumers face budget constraints due to income limitations. A budget line represents the combinations of available goods that can be purchased, with consumer income and price in consideration. Therefore, purchasing power is highly related to the available budget of consumers. Both income and price may change over time, which will make budget line shifts that are either positive or negative. However, inflationary conditions where all prices and income levels increase proportionally will not affect the budget line.

Consumer choices

The last element takes the two previous elements into account, resulting in the possibility of determining how individuals choose goods and quantities. Pindyck and Rubinfeld (2013: p. 68) argue that choices are based on rationality, where satisfaction maximisation is achieved on budgetary limitations. To conclude, the optimal consumer choice has to be a market basket located on the budget line, in addition to providing the consumer with the most preferred combination of goods and services.

3.2 Consumer ethnocentrism

Ethnocentric people believe that their own group is the centre of their world and will use their own culture as a comparator. This concept extends to the field of marketing if one considers factors that influence or forge consumer behaviour (Javalgi et al., 2005). According to Shimp and Shawarma (1987: p. 280), consumer ethnocentrism can be defined as "*the term "consumer ethnocentrism" to represent the beliefs held by American consumers about the appropriateness, indeed morality, of purchasing foreign made products".* According to Javalgi et al. (2005), a consumer with an ethnocentric mind-set may be willing to purchase foreign goods in cases where the products are deemed necessary, if such a product is not available in domestic production.

3.3 Corporate Social Responsibility

Corporate social responsibility can be defined as a social contract between corporations and society, based on long term social demands and expectations (Lantos, 2001). CSR is increasingly important among consumers as sustainability, ethical sourcing, food miles and

other factors are considered. Consumers are expected to pay more for products that are 'socially responsible' and might be more supportive of companies who care enough to be so. Further, this might lead to increased demand for products from reliable brands / producers. Consumers' interest in sustainable production of food is likely to be an increasing trend, particularly in wealthy developed countries (Bjørndal et al., 2014).

3.4 Country of Origin

The information and knowledge of Country of Origin (CoO) have seen a significant increase the last few decades, and several CoO issues have been addressed (Phau and Chao, 2008). An example of the use of CoO is the use of stickers with "made in" or "manufactured in". Balbanis et al. (1996, in Jenes, 2007: p. 3) define CoO more precisely as a "*a marketing concept which captures the consumers differentiated beliefs towards different nations".*

> When cultivating a new export market or attempting to expand its share of an existing market, an exporter is likely to find that it has been preceded by its reputation. Absent a readily identifiable brand name, quality reputation may solely reflect the country of origin. For example, when consumers are presented with a large amount of complex product information they may use the country of origin as a heuristic in forming product impressions without considering other product attributes (Chisik, 2002: p. 582).

3.5 Country of Origin image

CoO image involves the general perceptions, or stereotypical images (similar to brand image) that consumers from one country, or region, form about another country or region (Veale, Quester and Karunaratna, 2006). Consumers tend to believe there is a 'natural' relationship of products according to a price scale where higher quality products are more expensive, and products of lower quality are cheaper (Bredahl, 2003; Dickson and Sawyer, 1990; Glitsch, 2000; Jover et al., 2004; Kardes et al., 2004; Monroe, 1976; in Veale, Quester and Karunaratna, 2006). Consumers tend to rely even more on price as a cue when they possess limited knowledge about the product (Veale, Quester and Karunaratna, 2006).

3.6 Power theory in a supply / buying scenario

Weber (1987, in Schleper, Blome and Wuttke, 2015: p. 102) defines power as *"the probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests".* This definition follows a stream of literature that is related to power over actors (Schleper, Blome and Wutke, 2015), such as in a supplier / buyer relationship. Buyer power, as the expression indicates, implies that a buyer has power to affect the terms on which he buys the product. This could be the price, other contract terms or product properties such as quality.

The idea behind the *oligopsony model* is the assumption that there are few buyers in the market, but a rather large number of sellers. Due to few buyers in the market, which can be the retail chains, the buyer will have buyer power towards the suppliers and seller power towards the end consumers. The result of an oligopolistic market is that the firms involved recognise their interdependence. Changes in volume and price will affect the profit for the other parties in the supply chain, as well as altering the profit of rival firms (Lipczynski et al., 2013).

The bargaining power of suppliers affects the market performance. A firm has the ability to control both prices and the supply of components when the bargaining power is high, as well as establishing their sourcing internally, which ultimately lead to a greater market performance. In contrast, if the bargaining power of a supplier is low, external sourcing is preferred to achieve the best results, and the firm obtains low switching costs which enables them to switch from one supplier to another without damaging the firm to a great degree. One example of high bargaining power for supplier is if the products offered are an important part of the buyer's input (Porter, 1980: p. 27).

On the other hand, bargaining power of buyers is related to an attempt to force down prices, as well as gaining higher quality and services from the suppliers. This can be obtained by having full information of the market, buying either large or concentrated volumes, and being integrated with the aim of enlarging profits. Retailers has significant bargaining power over the suppliers when they can influence the purchase decisions towards end-customers (Porter, 1980: p. 27).

3.7 Demand functions

A general demand function is given by

$$(1) \quad Q = f(P_q, Y, P, X)$$

Where $\mathbf{P_q}$ is the price of quantity imported, **Y** is income and **P** is substitute price, and **X** is the vector of exogenous variables. The demand for business to business customers is given by the multiplicative demand equation (Pindyck and Rubinfeld, 2013: p. 34):

$$(2) \quad Q = \propto * P^{\beta 1} * Y^{\beta 2} * P_{s_t}{}^{\beta 3}$$

In our case, **Q** is import statistics from the five largest exporters of smoked salmon to France, including domestic production of smoked salmon in France. **P** is the price of import, $\mathbf{P}_{s_t}$ is the price of the substitute product and **Y** is the income of the population in France, measured by GDP per capita and transformed by using the consumer price index (Tradingeconomics, 2018).

Empirical demand function

An empirical version of equation (3) is obtained by taking a natural logarithm of the multiplicative model (equation 2)

$$(3) \quad \text{Ln } Q_t = A + \beta_1 \text{Ln } P_t + \beta_2 \text{ Ln } Y_t + \beta_3 \text{ Ln } P_{s_t} + \in_t$$

Elasticities are now constant in this model and **A** is the new constant term, while **t** indicates the years used in the regression analysis (1995 – 2016). The different symbols can be interpreted as follows: $\beta_1 \text{Ln } P_t$ is the price elasticity of demand, $\beta_2 \text{ Ln } Y_t$ is the income elasticity and $\beta_3 \text{ Ln } P_{s_t}$ is the cross-price elasticity. Furthermore, by converting all values into a natural logarithm, the process of estimating a time series will be simplified.

Price elasticity

According to Pindyck and Rubinfeld (2013: p. 34), elasticity measures the sensitivity of one variable to another. Specifically, an example of elasticity is price elasticity of demand. It can

be defined as the percentage change in quantity demanded for a good because of a one per cent increase in its price, and can be written as follows:

$$E_p = \frac{\Delta Q/Q}{\Delta P/P} = \frac{P \Delta Q}{Q \Delta P}$$

Price elasticity of demand is written as $\mathbf{E_p}$, while **Q** means quantity and **P** is price. The triangle represents the percentage change in either quantity or price. Commonly, if the price increases, the demand will fall. Therefore, the price elasticity of demand is normally a negative value, meaning there is a negative relationship between price and demand. For example, if $\mathbf{E_p}$ = - 2.5, the elasticity is 2.5 in magnitude. The demand is price elastic when the magnitude is greater than one, which means that the decline in quantity demanded is greater than the increase in price, in percentage. In contrast, if the magnitude is less than one in magnitude, the demand is price inelastic. For example, if the price of smoked salmon increases by 1% and the result is a decrease in demand of 1.5% (more than 1%), the price elasticity of demand is elastic. However, if such a price increase lead to a 0.5% decrease in demand, the price elasticity of demand is inelastic although there is an impact and relationship between the two variables. Ordinarily, the price elasticity of demand of a product is interdependent on the availability of other product substitutions. As a result, the demand is price elastic. However, if there are no product substitutes, the demand is normally inelastic. Consumers tend to be affected by price elasticity differently. Loyalty is an important factor, as loyal consumers tend to be less price sensitive and will consume approximately the same amount although the price changes. On the contrary, consumers that are not loyal will choose a product when they receive the highest value, due to price sensitivity (Krishnamurthi and Papatla, 2003).

Income elasticity

Another form of elasticity is income elasticity, which states that demand usually increases when aggregate income rises. A percentage change in the quantity demanded of a good is a result of a one per cent increase in income. The formula can be written as follows (Pindyck and Rubinfeld, 2013: p. 36):

$$E_I = \frac{\Delta Q/Q}{\Delta I/I} = \frac{I}{Q}\frac{\Delta Q}{\Delta I}$$

GDP per capita in France has increased during the last century, which has resulted in greater purchasing power. However, the unemployment rate is high, implying that purchasing

awareness is an important issue in the country. It is of importance to mention that greater purchasing power does not necessarily mean that every consumer is likely to buy more, but it is rather a general tendency as more people have the opportunity to purchase goods.

Cross-price elasticity

Different from the two other forms of elasticity, cross-price elasticity takes substitute prices into account. It is referred to as the percentage change in the quantity demanded of a good as a result from a one per cent increase in the price of a substitute (Pindyck and Rubinfeld, 2013: p. 36). The formula can be written as follows:

$$E_{Q_b P_m} = \frac{\Delta Q_b / Q_b}{\Delta P_m / P_m} = \frac{P_m}{Q_b} \frac{\Delta Q_b}{\Delta P_m}$$

Q is said to be the quantity of the product chosen (product 1), while **P** is the price of the substitute product (product 2). Normally, if it is a good substitute that directly competes with product 1, an increase in the price of the substitute leads to an increase in demand for product 1. However, some products tend to complement each other. If both products tend to be used together, an increase in the price of product 2 leads to a decrease in demand for product 1, because the consumption for both will be pushed down (Pindyck and Rubinfeld, 2013: p. 36). Other seafood products, for instance cod, could potentially substitute salmon (de Perlinghi and Pettersen, 2017), as well as other luxury products used similarly such as cured meats. Xie and Myrland (2011) found that frozen salmon could substitute fresh salmon and be a complement to smoked salmon. Furthermore, their study shows fresh salmon and smoked salmon to strongly substitute each other.

The three different types of elasticity that are presented are related to demand. It is possible to change the formulas from quantity demanded to quantity supplied. As a result, three new price elasticities are made, which highlights supply rather than demand. Furthermore, as this thesis focuses on demand, the elasticities of supply will not be included further.

3.8 Niche marketing

According to Winther et al. (2011), there are opportunities for smoked products in a niche market towards high paying consumers. A niche can be defined as a small market consisting of an individual customer or a small group of customers with similar characteristics or needs

(Dalgic and Leeuw, 1994). Niche marketing often starts with a clear idea of the limited markets and needs of what define the market (Toften, 2005).

Niche markets tend to have the following characteristics (Dalgic and Leeuw, 1994):

- sufficient size to be potentially profitable;
- no real competitors, or markets which have been ignored by other companies
- growth potential;
- sufficient purchasing ability;
- a need for special treatment;
- customer goodwill; and
- opportunities for an entrance company to exercise its superior competence.

4 METHODOLOGY

To the best of our knowledge, after extensive research, there is limited data and research on the demand for smoked salmon in France, at least focusing on smoked salmon from Norway. Xie and Myrland's (2011) study will be used as a means of comparison as it is relatively new and investigates France. However, the time series is different, and the writers use aggregated consumer demand data rather than trade data. The quantitative data utilised in this thesis has been collected by the Norwegian Seafood Council and Eurostat, using each country's import statistics. The data for domestic production in France were obtained by EUMOFA. The thesis combines qualitative methods for analysing RQ2, RQ3 and RQ4, as well as quantitative methods that focus on analysing RQ1 and H1-H3. The combination of semi-structured in-depth interviews with central actors in both Norway and France can provide subjective perceptions of the market. This could lead to a broader picture of the market situation and the demand for Norwegian smoked salmon, as well as the competitors.

To identify the papers included in this thesis, three different search engines were used: Oria, Google Scholar and the ISI Web of Knowledge. The validity for consideration of the journals must be relevant and were thoroughly examined through the search process. The search engine primarily used was Oria and is easily accessible providing a wide range of academic literature. Later, Google Scholar and the ISI Web of Knowledge were used to receive different results from Oria, as the search engines have different algorithms providing diverse results. The first searches were done in a Boolean style in Oria, where the keywords "and, not and or" were combined with "salmon" and "demand" to find previous, general research on the topic. Afterwards, "smoked salmon" was searched for in combination with "demand", "price" and "France" to find more in-depth analyses of the country chosen. This resulted in just 860 articles and review papers in total, forcing us go through the papers systematically to narrow it down and find as many, but more precise papers related to the research question, as possible. To narrow the results down, one criterion was to filter some of the review papers and prevent them from overlapping. To achieve this, the most relevant papers based on their analyses and results had to be chosen, with a goal of picking the ones that supported the thesis based on our own opinions. Another criterion was to be more specific when using the search engines to find relevant review papers supporting the research questions. This was done by adding "Country of Origin", "Norway" and "bargaining power" both singularly and all together into the previous searches, where the main focus was on examining well-known

authors in the field of research. After reading the titles, abstracts, introduction and conclusions, a decision was made about which journals were of relevance for this thesis.

4.1 Research design

"Studies might be either exploratory, descriptive or causal in nature. The nature of the study - whether it is exploratory, descriptive or causal - depends on the stage to which knowledge about the research topic has advanced." (Lee and Lings, 2013: p. 96)

An *exploratory* study is used when not much is known about the situation at hand, or no information is available on how similar problems or research issues have been solved in the past. Exploratory studies are necessary when some facts are known, but more information is needed for developing a viable theoretical framework. The objective of a *descriptive study* is to describe. They are often designed to collect data that describe the characteristics of people, events, or situations. *Causal studies* are at the heart of the scientific approach to research. These studies test whether one variable causes another to change. In a causal study, the researcher is interested in delineating one or more factors that are causing the problem; or, in other words, that variable Y causes X (Lee and Lings, 2013: pp. 96-98). This study uses a combination of causal and exploratory research to examine which variables have the highest effect on the demand for Norwegian smoked salmon in France. Although there are several studies examining the demand for whole, fresh salmon to the European market (Asche et al., 2011; Xie and Myrland, 2011; Brækkan and Thyholdt, 2014), there is limited research on secondary processed salmon products such as smoked salmon.

4.2 Qualitative analysis

According to Wilson (2011: p. 103), qualitative research can be defined as research which is undertaken using an unstructured research approach with a small number of carefully selected individuals to produce non-quantifiable insights into behaviour, motivations and attitudes. A qualitative approach is normally used in an exploratory study. Individual depth interviews are conducted face-to-face and the matter of the interview is explored in detail using an unstructured and flexible approach. In-depth interviews are used to develop a deeper understanding of consumer attitudes and the reasons behind specific behaviours. Although an interview guide is used, the interviewers use their knowledge of the research objectives, the information gained from other interviews and the comments of the respondents to select

which parts of the dialogue with the respondent to further explore, which to ignore, and which to return to later in the interview. The result of this is that the interview content and the topics raised may change over a series of interviews as the level of understanding increases (Wilson, 2011: p. 105).

Semi-structured interview

Semi-structured interviews have a focus on both reliability and validity and overcome poor responses from questionnaires and other methods that do not offer face to face contact between the interviewer and the respondents. Further, it is well-suited for exploring perceptions and opinions of complex issues, as well as obtaining deep and clarified information (Louise Barriball and While, 1994). For this study, interviewing relevant actors will help increase the understanding and knowledge of the French market and factors related to the research questions.

Interview selection

In order to select which interview candidates would be suitable for this study, extensive research and discussions with already established contacts were conducted. There are several smokehouses in Norway, and several of the biggest actors were contacted. Due to the limited time and resources, candidates located close to Sunnmøre / Ålesund were preferred. All the interviewees were assured of confidentiality both regarding their names and companies. The interview candidates in France covered a sizable portion of the supply chain, which could lead to a broader sense of the market situation for Norwegian smoked salmon, as well as smoked salmon in general. The purpose of the qualitative study was to gain more depth as well as breadth regarding which factors affected the demand for Norwegian smoked salmon, and which challenges the interview candidates experienced. These factors included how CoO affected the demand, and how the power balance affects the supplier and buyer relationship. The interview guide is shown in Appendix 8.

Qualitative data selection

Before conducting the interviews, it was vital to gain a profound understanding of the topic as well as the context to properly interpret the interviewee and their answers. In Norway, the interviews were conducted in Norwegian as all the interviewees were fluent in the language, leading to no language barriers. The interviews conducted in France were done in English,

which was both the interviewees' and the interviewer's second language. This could have resulted in some language barriers; however, most interviewees spoke decent English.

According to Bailey (2008), the first steps in interview transcription is understanding the aims of the project, followed by to what extent it should be transcribed in detail. It is vital to find what is of relevance to the thesis, and to fully interpret the results of the interviews; we decided it was necessary to record all the meetings. The interviews lasted between 45 - 60 minutes, requiring us to group the transcription into social talk and relevancy. Therefore, the final transcriptions were sent out to the interviewees as e-mail attachments in writing, as it was of importance that the transcriptions were accepted for further use in the thesis. Only the parts relevant to the thesis were sent out, giving the interviewees the opportunity to comment so as to avoid misinterpretations.

4.3 Quantitative analysis

According to Wilson (2011: p. 103), quantitative research can be defined as research which is undertaken using a structured research approach with a sample of the population to produce quantifiable insights into behaviour, motivations and attitudes.

Statistical analyses

The following section provides a description of the various statistical analyses used in this study. The results generated from the various analyses are used to accept or reject the proposed hypotheses. Furthermore, the results will be discussed alongside the results from the qualitative part of the thesis. The quantitative analysis is completed through descriptive statistics, and hypothesis testing through OLS regression analysis. Time series was used as the variables behave predictably over the years measured. Time series are a set of observations, each being recorded at a specific time (Brockwell and Davis, 1991: p. 1).

Descriptive statistics

By conducting descriptive statistics, the characteristics of rather large data sets are summarised into a few key numbers. Normally, measures of central tendency such as mean, mode and median, and measures of variability such as range, interquartile range and standard deviation are used. The mean is probably the most common method used for finding the average in marketing research and this can be done by summarising all the values and

dividing them by the number of cases. The mode represents the most commonly occurring value, based on frequency. The median is the value of the middle case in a series, no matter what order the data is in. The other category, measures of variability, indicates how spread out a set of data is. The range is found by calculating the difference between the highest and lowest value. The interquartile range is a more complex calculation and aims to reduce the impact of any extreme values by measuring the difference between the 75^{th} and 25^{th} percentile. Standard deviation is the last measure and is the most common method in measures of variability. The square root of the sum of the squared deviations from the mean is divided by the number of observations minus one (Wilson, 2011: p. 211).

Furthermore, the descriptive analysis also provides information about the distribution of scores and can be explained by the skewness and kurtosis. The skewness provides an indication of the distributional symmetry. If the distribution is skewed to the right, the values are negative and vice versa with positive values. On the other hand, kurtosis give information about how peaked the distribution is. The kurtosis is peaked if the values are positive, and relatively flat if the values are negative. Such variables are important to use if a t-test or analysis of variance is used in a study (Pallant, 2016: p. 58).

Regression analysis

Regression analysis is a statistical analysis widely used in the scientific field. According to Hair et al. (2014: p. 16), multiple linear regression analysis is a dependable and statistical technique that discovers the relationship between a single dependent variable and multiple independent variables. The aim of this method is to use the known values of the independent variables to predict the chosen dependent variable. Another form of regression analysis is the simple linear regression, which differs from the first analysis in that there is only one independent variable. The last type of regression analysis is a non-linear regression which assumes the relationship between the independent and dependent variables is not linear in regression parameters. By taking the problems and aim of this study into consideration, the multiple linear regression analysis is the most appropriate one to use for studying the impact of price, quantity and GDP per capita.

According to Hair et al. (2014: p. 16), determining the variance in the dependent variable explained by the independent variables will help predict the dependent variable. In addition, all variables must be based on either interval or ratio scales to be suitable for a multiple

regression analysis. Different measures must be considered when explaining the values obtained by such an analysis. The coefficient of determination shows how much variance the variables share. This is known as the R square. An approach that can be used is multiplying the R square by itself, which shows how much variance the variables share. The adjusted R square takes the sample size and number of independent variables in the regression model into account and is normally a lower value than the original R square. The adjusted R square tries to correct the R square value and is normally used when the sample size is small. The F-test is used to evaluate the difference between the group means, and the higher the value, the more likely is the null hypothesis to be rejected. The unstandardized B value explains the change the independent variables have on the dependent variable when the other independent variables are considered constant. Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model. The calculation is quite simple as the formula is 1 – R Squared for each variable. The VIF value is the inverse of Tolerance, and as the values are all good, they avoid multicollinearity. To be appropriate, the VIF value should be below 10, and the Tolerance value should be above 0.1 (Pallant, 2016: p. 160). Further, this study aims to validate the cases where the null hypothesis is rejected, and this can be done by looking at the significance level. If the constant significance level is 0.05 (5 per cent) and the p-value for the independent variable 0.02 (2 per cent), you reject H0 at a 5 per cent level, but not at a 1 per cent level. As a result, the closer the significance level is to 0.00, the harder it is to accept H0.

In order to test the data for autocorrelation, Durbin–Watson can be interpreted. Durbin–Watson tests whether adjacent residuals are correlated, and the test statistics can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated. A value higher than 2 indicates negative correlation between the adjacent residuals, and a value lower than 2 indicates positive correlation. As a rule of thumb, Durbin–Watson test statistics lower than 1 or higher than 3 are cause for concern. However, values closer to 2 may still be problematic, depending on the sample (Field, 2009: p. 236). Figure 4.1 illustrates the lower and higher bounds of the Durbin–Watson test.

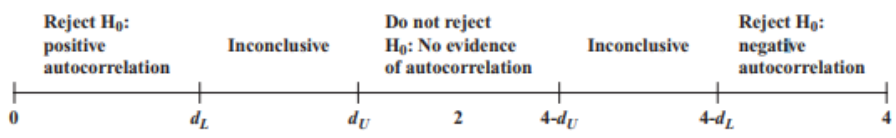


Figure 4.1: Durbin–Watson

Source: Brooks, 2002: p. 147

If there is autocorrelation present, the possibility exists that the wrong inferences are drawn about whether a variable is an important determinant of variation in y. If there is positive serial correlation in the residuals, the OLS standard error estimates will be biased downwards relative to the true standard errors. Thus, the OLS will understate the true variability. This results in a higher possibility of a type 1 error, which is the tendency to reject the null hypothesis when it is correct. Furthermore, R square is likely to be inflated relative to its true value in the case of autocorrelation but ignored, as the residual autocorrelation will lead to an underestimation of the true error variance (Brooks, 2002: p. 150)

4.4 Data

The quantitative part of the study uses secondary data collected by external sources available in the Norwegian Seafood Council's (2018) databases. The import data to France from the respective countries was chosen as it was viewed as the most appropriate for this study. The data consists of time series of demand quantity, prices, and income from 1995 to 2016, resulting in a time series of 22 observations. This is a very limited number for a time series, and our results are therefore likely affected by this.

Dependent variable

The dependent variable in this study is demand for smoked salmon in France, measured in tonnes. As this is a demand study for smoked salmon, the French consumers' demand is expressed by their willingness to pay for the products. Further, the aim of this study is to look at the independent variables' possible influence on demand over a period of time. In the dependent variable, we have included Poland, UK, Germany, Denmark and Norway as the relevant countries. According to French import statistics, 105,000 tonnes of a total 118,000 tonnes were imported from these countries (NSC, 2018), and according to the literature, these countries traditionally have an established processing industry (Asche and Bjorndal, 2013). This study will measure if the independent variables affect the demand of smoked salmon in France.

Independent variables

Price is affected by shortages and surpluses, meaning that there will be a higher price when there are shortages and lower price with surpluses. The demand curve shows demand relative to supply, and if consumers want more of a product, the demand will exceed supply. A rise in

income leads to greater purchasing power, which will result in consumers buying more of a product than before. In addition, if the price is low, consumers are more likely to buy more of a good. Loyal consumers may buy greater quantities and consumers that previously were unable to buy the product begin buying it. In contrast, if the price rises, loyal consumers buy less, while some consumers will not be able to afford it (Jensen and Drozdenko, 2008).

If the price of a competing product is reduced, this product becomes more attractive to the consumers. Thus, this will result in more demand for the cheaper product and a reduction in demand for the product of interest (Asche and Bjørdal, 2013: p. 121). Secondary data for the substitute prices were collected by the NSC because of different suggestions for appropriate substitute products from the interviewees. In the past, cod has been able to substitute salmon when the price distance is large. In addition, salmon prices have been higher than the French consumers have been willing to accept the past few years, which supports the previous statement of relevance regarding cod as a substitute product (de Perlinghi and Pettersen, 2017). Thus, ideally, cod should have been included in the regression analysis as a substitute product. However, as available data were lacking and with a relatively short time series, fresh salmon fillet was used as the only substitute. According to Xie and Myrland (2011), frozen salmon is a substitute for fresh salmon and a complement to smoked salmon. Furthermore, they found fresh salmon and smoked salmon to strongly substitute each other. Gross domestic product per capita is measured by dividing the gross domestic product by the total population (World Bank, 2018). In this study, we transformed the nominal prices into real prices. A consumer price index for France was used in the transformation. By dividing all the values in the CPI by 100, it was possible to multiply the new values by all the prices of the independent variables. Such an approach results in real prices.

4.5 Reliability and validity

Validity and reliability can be used to measure the goodness of measures. Validity is a test for how well an established instrument measures the concept it is intended to measure. In other words; validity is concerned with whether we measure the intended concept or not (Bajpai and Bajpai, 2014). Reliability is concerned with the extent to which a variable or set of variables is consistent in what it is intended to measure. If multiple measurements are taken, the reliable measures will all be consistent in their values. It is different from validity in that it relates not to what should be measured, but how it is measured (Hair et al., 2014: p. 7).

Reliability

Demand studies have been conducted on Atlantic salmon previously (Asche et al., 2011; Brækkan and Thyholdt, 2014), but fewer on smoked salmon. Thus, this could affect our reliability when comparing previous studies. The results will be compared to a study by Xie and Myrland (2011). Reliability is also concerned with the accuracy of the information processed. Notes were taken during the interview, and if accepted by the interviewee, recorded for later review. The recorded interviews were later transcribed and deleted after reviewing for the interviewee's privacy. The data received for the quantitative study was received from a reliable source, the Norwegian Seafood Council. However, since the data was not collected by the researchers, and it was not specifically collected for this study, there could be an issue related to the accuracy of the data. In addition, the length of the time series could be a factor affecting the reliability as there should be greater numbers of observations. The reliability might be affected as it is possible that an important variable that should be included is excluded in the analyses. Another variable which is hard to account for is the accuracy of the data regarding intratrade inside the EU; which could lead to misleading numbers (Hustadnes, 2018). Further, as France changed their currency to EUR from FRF in 2002, the data prior to this is in ECU.

Validity

Validity refers to the extent to which the conclusions drawn from the experiment are true. There are two main types of validity: internal validity and external validity. Internal validity refers to the extent to which the research design accurately identifies causal relationships; or, in other words, when the researcher can rule out other explanations for the observed conclusions about the functional relationship. External validity refers to the extent that a causal relationship found in a study can be expected to be true for the entire target population (Shiu et al., 2009: p. 281). Internal validity is concerned with how the information is collected and interpreted. To ensure good internal validity, the transcripts of the interviews were sent to the interviewees, so they could confirm and verify their answers. Regarding external validity, the context of the study is based on a product and an industry in Norway, with other producing countries such as Poland, Great Britain, Denmark and Germany included in the quantitative analysis.

5 RESULTS

The following chapter will present the results from the in-depth interviews (qualitative study) and the regression analyses (quantitative study).

5.1 Qualitative results

The qualitative results are based on five interviews in France and five interviews in Norway. The French interviews were conducted with companies throughout the value chain. In Norway, the interviewees were producers of smoked salmon and exporters of fresh salmon. See Appendix 7 for more information on the interviewees.

Questions	**Answers**
Q1. **What are your current largest markets for salmon? What is the difference between these markets and the French market?**	**Interviewees from Norway**. The exporters from Norway focused on different markets. Europe, the Middle East, the USA and South East Asia are their largest markets. The difference between these countries/regions compared to France is the French traditions, development and focus on domestic production. As a result, France has a wider selection of products, and these products are preferred due to ethnocentrism. Another difference (from the Asian countries) is the EU tariffs with processed products exported from Norway. This is perceived as (one of) the greatest barriers in the market growth of processed products in France, and much of the raw material is processed in Poland to avoid the tariffs. Comparing France to another European country, such as Italy, the development of the market is a big difference. As a result, there are

	more possibilities and opportunities for establishment in Italy than France.
	Interviewees from France. All of the companies had different roles in the supply chain. The importer mainly focused on traditional markets such as restaurants, fishmongers and generally HORECA. They currently did not import any smoked salmon from Norway, but imported a significant amount of HOG salmon and cod / skrei. They also had their own filleting unit located close to Paris, which means they could handle their own processing according to the customers' needs. The two processors both focused on the retail market, where one focused on their own brand and the other on private labels for the different retail chains. One of the processors had factories in Scotland and Poland as well, and noted the difference that in France, in terms of volume, Norwegian salmon smoked was the most popular in France. In Scotland, the company is mainly a processor, and export the products to other European markets. The online wholesaler had a special concept, as they did not own any stock themselves; they put the supplier and buyer in contact. They were operating in Belgium, Switzerland and Paris at this point, and noted that the France consumers

	were more informed about the products they bought and had more strict preferences.
Q2. **When and why did you start importing / exporting to France?**	**Interviewees from Norway**. France is one of the largest markets for salmon in Europe, which led to a market involvement in France from the very start. Others were not exporting smoked salmon to France at the present time due to the reasons explained in Q1.
	Interviewees from France. Mainly for the Norwegian interviewees.
Q3. **Which fish types and seafood products do you import/export to France? Why?**	**Interviewees from Norway**. All respondents export more than just smoked salmon. Different seafood and processed products are exported.
	Interviewees from France. Similar to the Norwegian exporters, only that they import different products.
Q4. **Which factors influence demand for smoked salmon? Health, trends?**	**Interviewees from Norway**. Price is the main factor from all respondents. Otherwise, country of origin, image, health and convenience are important factors to consider.

	Interviewees from France. All the interviewees noted price to be the number one factor for influencing demand. There is a price delay, at least in retail chains. In 2016, there was a significant price increase from 40 to 70 NOK. The supplier is often unable to renegotiate the contract with the retail chain, which results in the retail chain being able to keep the same prices, regardless of the prices increases of raw material. By 2017, the suppliers were able to renegotiate their prices, which according to the interviews, lead to an increase of 15% to 20%, which they in turn estimated led to a decrease of consumption from 16% to 20%. All respondents agreed that CoO and labels also had an effect on demand for smoked salmon.
Q5. **What are the challenges regarding smoked salmon in France? Environmental issues? Scandals?**	**Interviewees from Norway**. Similarly to the French respondents, scandals; specifically the TV scandal in 2013, affected the production and export of all farmed products to France. Having a positive image is essential for Norway.

	Interviewees from France. All the interviewees noted that the image of Norwegian salmon is easily affected by scandals and bad TV reports. The image of Norwegian salmon is ambivalent, and previously it was linked to pure, clean water and nature. As more people got information about the industry behind farming and aquaculture, the image of salmon farming was affected. Every single interviewee noted that a negative TV report from November 2013 had a serious effect on sales.
Q6. **Does price have a great impact on demand for smoked salmon?** **The price has been fluctuating very much the last few years. How does this affect the market, and how do you handle the price variations with customers?**	**Interviewees from Norway**. Yes, it influences demand. Contracts are a method to handle the price fluctuations.
	Interviewees from France. Generally, back to back contracts. Decreased volumes when prices are high.
Q7. **Does exchange rate fluctuations influence your import/export quantity?**	**Interviewees from Norway**. Yes, it does. However, the interviewees noted that this is mostly in the short-term. This is because a lot of the export of smoked salmon to France is settled by contracts. Export of the raw material however, is being affected more by the exchange rate as most of the export being sold is on spot-price.

	Interviewees from France. The interviewees were split regarding whether the exchange rate affected demand or not. Most of them noted the fluctuations of raw material (whole, gutted salmon) to be more important than the exchange rate. They noted that as the raw material is very volatile; 'almost like a rollercoaster' one noted, whereas exchange rate is likely to be more stable in comparison. One noted that the raw material price and exchange rate is somehow linked, and a higher exchange rate will lead to a lower raw material price.
Q8. **Has the country's economic growth had an impact on demand in the national market?**	**Interviewees from Norway**. The respondents noted in general, yes. More income leads to greater purchasing power, which leads to more demand. However, this was a difficult question to answer in depth.
	Interviewees from France. The respondents had conflicting opinions regarding the effect of income and economic growth. There is likely to be some effect, as smoked salmon can be considered a luxury product. However, the consumers can find very cheap smoked salmon. Those with higher incomes are likely to aim for higher quality, whereas those with lower incomes might go for lower quality.

Q9. **Do you believe that population growth has an influence on demand?**	**Interviewees from Norway**. All the respondents agreed. More people will generally lead to more demand.
	Interviewees from France. All of the respondents agreed regarding population growth: more people, more demand.
Q10. **ETHNOCENTRISM: Do you believe a French consumer would prefer salmon smoked in France, rather than another country?**	**Interviewees from Norway** The Norwegian respondents agreed, and this is similar in most countries. Who would not prefer a domestic product (in general)? People see the importance in supporting local food/products, which is why it is generally preferred.
	Interviewees from France. All the interviewees agreed on this question. However, some noted the consumers might not have the knowledge to differentiate between the different salmon farming countries and where it is smoked; which is why labelling can have an effect. One noted this could be a trend all over Europe, as 'local' food is becoming more and more popular, and this is also happening in France. Another one noted the increase of aquaculture in France, primarily trout production, to be an interesting example of this.
Q11.	**Interviewees from Norway**. French interviewees only.

According to our data, younger consumers are eating more seafood, including smoked salmon. Why do you think this is? Do you believe this trend will continue?	**Interviewees from France.** All the respondents agreed with this question. Several noted the convenience of smoked salmon to be a major factor for younger consumers choosing this. Some noted trends that influence the demand of the younger consumers, such as sushi and vegetarian trends.
Q12. **Health benefits and good taste are listed as the main reasons for choosing seafood. Can you think of any other important factors?**	**Interview objects from Norway**. French interviewees only.
	Interviewees from France. One interviewee noted it is a gastronomic product ingrained in their culture. Others mentioned the vegetarian trend to be another possible factor.
Q13.	**Interviewees from Norway**. French interviewees only.

Do you believe smoked salmon is an important part of French food culture? E.g., is smoked salmon a 'must have' during holidays, Christmas and so on?	**Interviewees from France.** All the respondents agreed that smoked salmon is an important part of the French food culture, especially during holidays. "It's Christmas; I need smoked salmon". One noted that it is not so much because of culture during the rest of the year, but more because of convenience. One believed 80% to 90% of the French population consumed at least one meal with smoked salmon during holidays, and as it is more and more available, this might affect other parts of the year as well.
Q14. **Who are your greatest competitors? Either countries or companies**	**Interviewees from Norway**. In terms of processing, Poland is the greatest competitor mentioned by all respondents. In France, other French smokehouses are competitors for the Norwegian firms.
	Interviewees from France. The French interviewees responded similarly to the Norwegian interviewees.
Q15. **In relation to other imported fish types, local catches and other products such as chicken – What do you think is the main substitute to smoked salmon?**	**Interviewees from Norway**. This question produced different answer from every respondent. It depends on the season and meaning of the meal, in terms of which product is the main substitute for smoked salmon. In the festive season, foie gras could be a substitute

	product. If people are buying the product to use it in a sandwich or similar, other cured products such as ham could be a substitute. However, in general, other fish products (fresh and processed) could be relevant substitute products.
	Interviewees from France. The respondents disagreed on this question. Several noted that smoked trout was the main substitute, as it is as close to being an identical product. One noted the average consumer might not even know the difference between salmon and trout. Other substitutes might be smoked ham, foie gras, shrimp, cod, or other seafood. In terms of the Christmas season, all the respondents mentioned foie gras as being an important substitute.
Q16. **Has Country of Origin an impact on what product the consumers decide to buy?**	**Interviewees from Norway**. The respondents think Country of Origin has a great impact on consumer decisions. The Norwegian Seafood Council is acknowledged, as they make a difference in marketing Norway as a country.

	Interviewees from France. All respondents agreed Country of Origin has an impact on the demand on which product the consumer decides to buy. Furthermore, it was unanimous that Scotland and Ireland had a better reputation than Norway. Scotland has received a good image due to Label Rouge, and Ireland has received a strong image through their organic salmon. Norwegian salmon is generally considered the 'standard'. One noted the trout farmers of France to have the best image and that it is considered a premium product.
Q17. **How do you see future potential?**	**Interviewees from Norway**. The future seems bright. As healthy products become more popular and people are expected to live longer, smoked salmon is going to be an important product in the future. Similarly, other seafood products have future potential and importance.
	Interviewees from France. Generally, the respondents agreed that unless there is another big scandal, the future potential for smoked salmon in France is bright. Several noted that a stable raw material price is mandatory for this.
Q18.	**Interviewees from Norway**.

How can Norway be more competitive as a processor in a European market, e.g. France?	All respondents provided similar answers to this question. To be more competitive as a processor, in the EU and other markets, innovative solutions and increased automation can help increase competitiveness as other low-cost countries do have an advantage due to cheaper labour. In a European market such as France, the tariff is the main factor for slowing competitiveness down. If this changes in the future, there will be a greater incentive to focus on the market. This competitiveness could change over a longer period, as it is not easy to become established in a huge market in the short term.
	Interviewees from France. The respondents had a hard time answering this question. One noted differentiation, both through product forms as well as marketing through a backstory to be an option. Everyone noted the taxes in Norway to be an issue. Another one mentioned the price of labour in Norway to be a problem, and increased automation might be an alternative. An automated factory can produce a fillet, and export it directly to the customer, which in turn will lead to lower transport costs compared to whole, gutted salmon, and thus a lower carbon footprint.

Q19. **Today, Norway has tariffs of 13% on smoked salmon. However, they have a tariff-free quota that historically has been reached by the end of the year. If Norway did not have any tariffs, but a free trade agreement on processed fish - do you think Norway would be more competitive and sell more to the EU?**	**Interviewees from Norway**. Answered in Q18. Yes, but this will be time-consuming.
	Interviewees from France. More related to the Norwegian respondents than the French, but the short answer is yes – Norway would probably be more competitive in France as a processor.
Q20. **Do you sell your products directly to the importers or do you use agents? What are the typical outlets?**	**Interviewees from Norway**. All respondents noted that most of the products were exported directly to the retail chains/importer. If there is an extra party involved, such as an agent, there will be a lower profit. In terms of export of salmon as a raw material, most of the products will be sold to the importer, who is a processor and who will sell the finished products to the retail chains afterwards.
	Interviewees from France. All respondents noted that they import the products directly. No agent is used.
Q21. **Is there a skewed power relationship between buyer and supplier?**	**Interviewees from Norway**. All respondents noted that there is a definite skewed power relationship between buyer and supplier. The farmer possesses most power, the

	retailer also has some power, and the processor is pushed from both sides as they possess less power.
	Interviewees from France. The respondents generally agreed the smokehouse, or the 'middle man', are in a vulnerable situation. The supplier (the farmer in Norway) has a significant amount of power. All respondents noted that they are often put in a 'take it or leave it situation', where they either must buy the salmon or not supply their customers. The suppliers have the power to set the prices, the sizes, and the volumes. The retail chain has some power in the market. However, some respondents noted that retail chains are more flexible, but they still have a significant amount of power.
Q22. **Is the imported fish treated in any way in France? Is the product sold whole / cut into smaller pieces / new packaging?**	**Interviewees from Norway**. Relevant for the French respondents.
	Interviewees from France. All respondents agreed on the answers to these questions. There is a lot of product variety and sizes, so it most definitely gets treated in different ways.
Q23. **Do you buy / sell on contracts or spot price?**	**Interviewees from Norway**. The respondents noted that smoked salmon is sold on contracts to a large degree, while whole,

	fresh salmon is sold mostly on spot-price. The different companies do both.
	Interviewees from France. All interviewees except one bought on both contracts and spot: the exception only bought on spot price.
Q24. **Do you export/import frozen or fresh?**	**Interviewees from Norway**. All respondents said that most of the products are exported fresh, but there are also some frozen products.
	Interviewees from France. Most of the interviewees imported fresh, but some also imported frozen products.
Q25. **According to Norwegian sources, the campaigns in French retail markets have begun to increase again. How long in advance are these campaigns planned? In relation to price fluctuations etc.**	**Interviewees from Norway**. Relevant for the French interviewees.
	Interviewees from France. Everything between three and 12 months.
Q26.	**Interviewees from Norway**. Labels provide security for the consumers and is important. The respondents mentioned Label

What is your opinion on labelling? Label Rouge, ecological labelling (ASC, Debio, and more), country of origin labelling ('SEAFOOD FROM NORWAY')	Rouge as an important label in France, and the Norwegian label "Seafood from Norway" was mentioned as important. Labels are perceived to be equated with quality and may increase both demand and the price-level.
	Interviewees from France. All of the respondents agreed with the importance of labelling in France. Label Rouge is well established, and organic products are well known. ASC is not yet known in France but it is believed that it will increase in the future. Furthermore, they believed most French consumers would not recognise the NORGE label.
Q27. **Do you export/import directly or through hubs? E.g., Denmark, Poland**	**Interviewees from Norway**. Directly.
	Interviewees from France. No hubs are used as every respondent imports directly.

Table 2: Interview results

Summary of the qualitative results

The qualitative results provide insight and knowledge by people in the industry relevant to the research questions in this thesis. RQ1 is analysed both qualitatively and quantitatively, where Q4, Q6 and Q8 of the interview guide ask specifically about price and income. The interviewees from Norway and France are unanimous that price is the main factor in the demand for smoked salmon in not only the French market, but also in general. Moreover, Q7 and Q23 elaborate on the topic of price even further, where exchange rates and spot/contract

prices are taken into account. The respondents highlighted the difference between fresh salmon and smoked salmon. Fresh salmon is mainly sold on spot price, in contrast to smoked salmon that is normally sold on contracts. As a result, changes in exchange rates will have less of an impact on demand for smoked salmon. This is due to longer preparation when settling a deal, as goods sold on spot prices can happen rather impulsively. In addition, exchanges rates are in focus more in the short term and will affect the price to a certain degree. However, changes in price/kg are noted to be more influential than changes in exchange rates.

According to the results obtained from Q5, Q10, Q16 and Q26, CoO has an impact on demand for smoked salmon. The respondents noted that the French consumers are a population with great knowledge and tradition regarding food. Therefore, the consumer segment can be rather detail-oriented and are easily affected by external market factors such as CoO and image. All respondents mutually agreed that there have been challenges regarding image, specifically after the bad TV report in 2013 of salmon farming in Norway; this affected people's perception of the industry and the goods produced. The research prior to the interviews had not indicated the French consumers had been so influenced by scandals. Thus, the results from the interviews regarding this was unexpected. Furthermore, both the Norwegian and French respondents noted CoO to have an impact on consumer choices, and smoked salmon from Scotland and Ireland are currently preferred to Norwegian salmon in France. The French respondents noted that labelled products are important to show quality and gain confidence around different goods and brands. Labels are often preferred and can be more in focus than CoO at times. This highlight the importance of CSR, as labelled products are perceived as high-quality and sustainable products. The actual importance of labels was unexpected, as we did not know how much this was in focus and appreciated in the French market beforehand. In addition, the respondents were asked if domestic products are preferred over international goods in order to measure the level of ethnocentrism in France. All respondents agreed that domestic products are generally preferred, but this could be similar in other countries as well.

The next research question, RQ3, is about the power relationship between supplier and buyer. In Q21, all respondents were asked directly if there is a skewed power relationship between

buyer and supplier. All respondents mutually agreed that the producer/supplier is the party that possesses most power in the supply chain. The smokehouse, which is the party in between, is the most vulnerable. The last link is the retailer. According to both previous literature and the interviewees, larger retail chains have achieved an increasing amount of power the past years. This could be due to having more flexibility than the smokehouse, as well as gaining power in a market with relatively few buyers and many suppliers. Therefore, the power relationship is concluded as skewed but might change over time.

The last research question, RQ4, concerns how Norway can be more competitive as a high-end processor in a large European market such as France. Q17, Q18 and Q19 are related to this question. The results obtained from Q18 are specifically related to RQ4. Most respondents from Norway and France noted that more automation can decrease costs and increase profits in the long run. Labour costs in Norway are high compared to low-cost countries such as Poland and automatized solutions can reduce these costs. As a result, Norway will be more competitive in the industry. Furthermore, Q19 concerns tariffs which are also a major issue regarding competitiveness. The respondents were asked if Norway could be more competitive if the country landed a free-trade agreement with the EU regarding processed goods. All respondents agreed, but the Norwegian respondents noted that this would be a time-consuming process. In Q17, the respondents were asked about the future potential of smoked salmon and the industry. All respondents agreed that the future seems bright unless a major scandal or change occurs. Healthy products are becoming trendier and more in focus which leads to a stable increase of demand as in the past. The raw material price is an important matter that is related to demand as this price will affect the price of smoked salmon. Since the industry most likely has a bright future, it will be essential for Norway to act and be more competitive in the industry to exploit the goods available and the market.

Other questions on the interview guide that are not mentioned substantiate the research questions and hypotheses comprehensively to achieve a fully and connected understanding of the topics.

5.2 Quantitative results

This section presents the results generated from the quantitative analysis on trade data of smoked salmon in France in order to reject or accept the research hypotheses. Statistical Package for the Social Sciences (SPSS) was used for the fundamental statistical analyses and Eviews 10 was used to study the residuals as well as different techniques in an attempt to search for errors and improve the statistical tests.

Descriptive statistics and normality test

The data are based on a time series from 1995 to 2016 and includes import data from Germany, Poland, Denmark, Norway, UK and domestic production in France. The complete dataset is shown in Appendix 9. The annual prices for smoked salmon and fresh salmon fillet is illustrated in Figure 5.1. Both products do have proportional growth in this time series, suggesting that there is a connection between them. There is a drop in smoked salmon price in 2010, which is due to there being no available data on French domestic production that year.

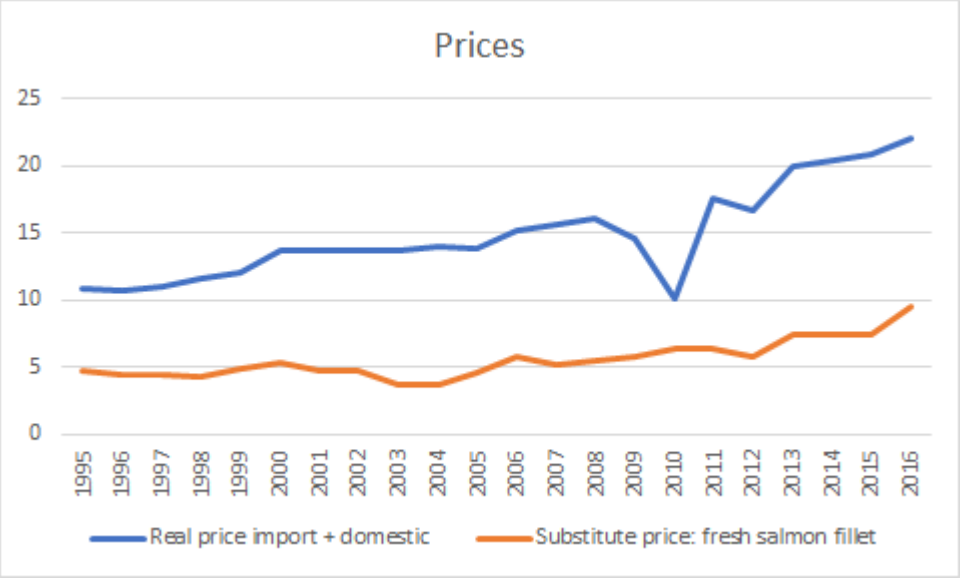


Figure 5.1: Comparison of prices between smoked salmon and salmon fillet

Figure 5.2 shows a comparison of GDP per capita and consumption of smoked salmon per capita. The calculations for consumption per capita are done by dividing the total population with total consumption, which provide an average consumption per capita.

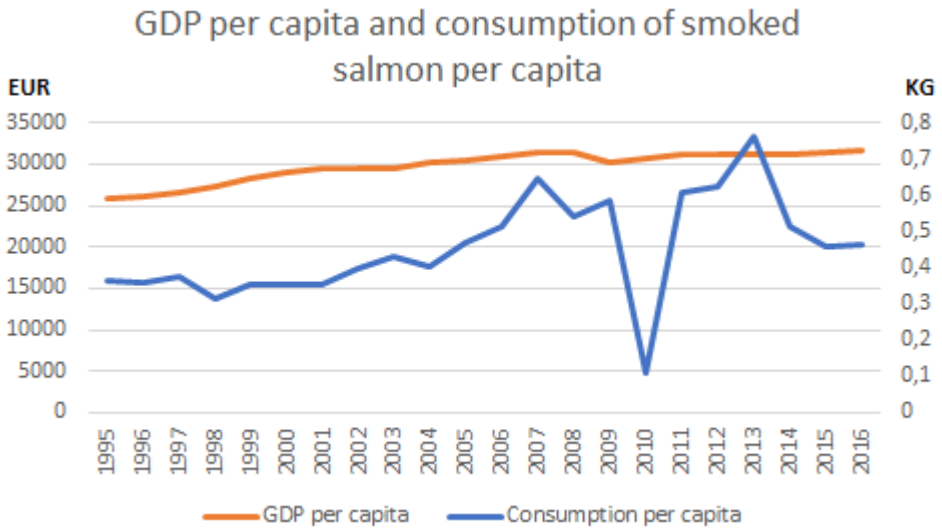


Figure 5.2: A comparison of both import and domestic production of smoked salmon and GDP per capita.

Figure 5.3 shows the relationship between price and volume on total imports and French domestic production of smoked salmon in France. The reason why the total volume of smoked salmon is included is because this is the variable that sets the price. As in Figure 5.1, there is no available data for domestic production in 2010. The price variable is weighted average price per kg in EUR.

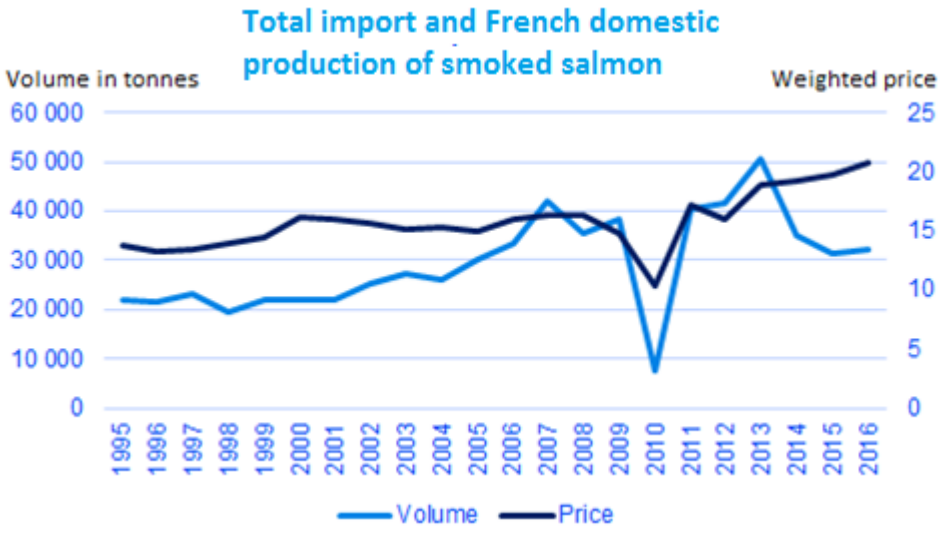


Figure 5.3: Total imports and French domestic production of smoked salmon in France.

A residual was generated as a basis for the normality test from the multiple regression analysis. The normality test should have a significance level of 0.05 or above. Shapiro-Wilk should be used instead of Kolmogorov-Smirnov when the number of cases is below 50 as a rule of thumb. However, both tests provide similar results, which implies that the results can be accepted, used and interpreted. According to Figure 5.4, the significance level is 0.772, and is quite respectable in this case. This means that H0 cannot be rejected, and the sample is normally distributed.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	,107	27	,200*	,976	27	,772

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 5.4: Normality test

The descriptive statistics are presented in Figure 5.5 and provide basic summaries such as mean, median and standard deviation of all the variables entered in our analysis. To assess the normality, it is also important to look at the histogram (Appendix 11a). In the histogram, the obtained skewness and kurtosis values will determine the normality. The skewness is 0.109, while the kurtosis is 0.361. With these numbers, the histogram will be skewed slightly to the left, and the kurtosis suggests that the histogram will not be steep. In addition, this is illustrated by looking at the Boxplot (Appendix 11b). The box is big, meaning the kurtosis is low. The higher the kurtosis, the steeper the histogram will be. According to the boxplot (Appendix 11b) there are no significant outliers, and the Histogram (Appendix 11a) are normally distributed.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Quantityimport	22	7045,00	50163,31	28917,5942	9652,32129	,109	,491	,361	,953
Realpriceimport	22	10,18	22,15	14,9431	3,47952	,664	,491	-,403	,953
RealGDPpercap	22	20489,59	33557,52	27944,3010	4278,78523	-,336	,491	-1,231	,953
RealSubwholecod	22	1,34	4,42	2,9766	,86333	-,622	,491	-,221	,953
Valid N (listwise)	22								

Figure 5.5: Descriptive Statistics

The sample contains 22 variables, from year 1995 to 2016. The maximum volume observed is 50,163.31 tonnes, and the minimum observed is 7,045.00 tonnes. The mean value in this period is 28,917.59 tonnes. The minimum observed price is 10.18 EUR, while the maximum observed price is 14.94 EUR. Furthermore, the points in Figure 5.6 should be as straight as possible from the bottom left to top right, diagonally (Pallant, 2016: p. 57). In this thesis, the Normal P-Plot obtained is almost diagonally straight, which suggests there are no major deviations from normality.

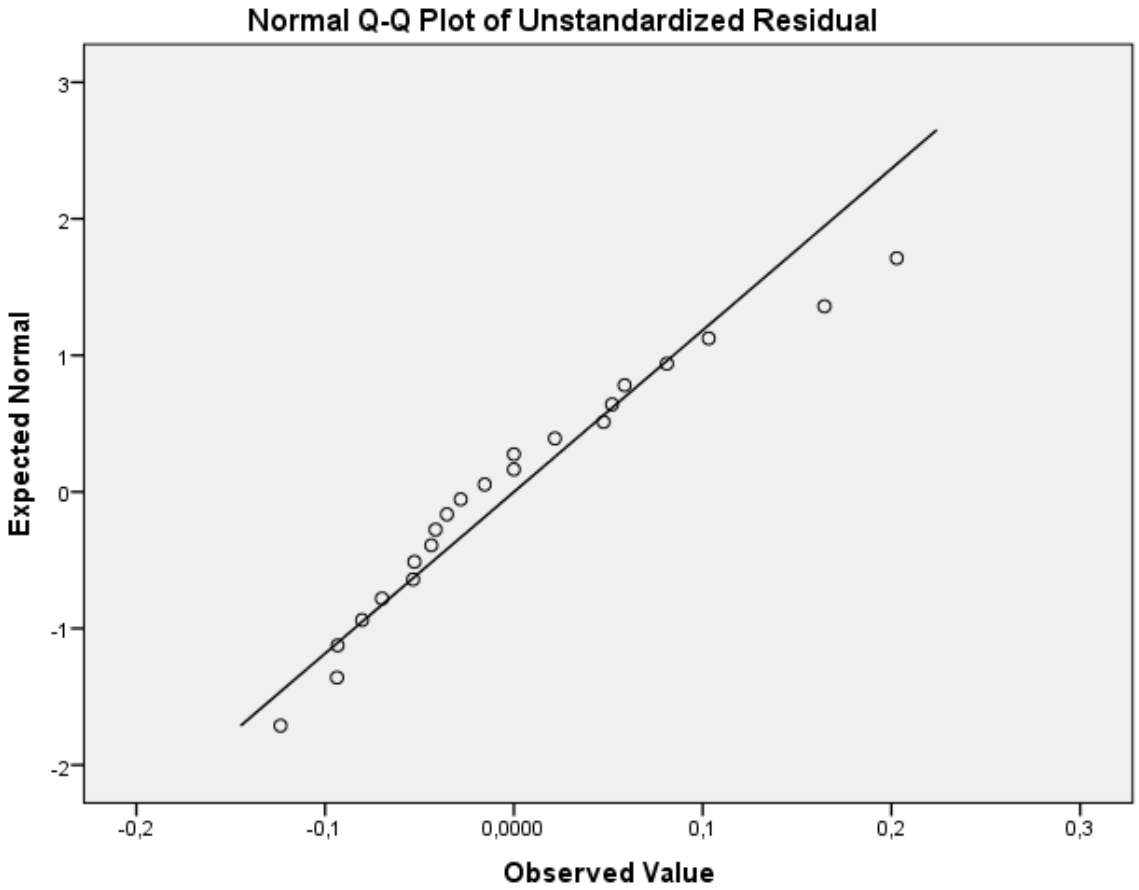


Figure 5.6: Normal Q-Q Plot of Unstandardized Residual

Residuals compare the estimated and observed mean. These should be as similar as possible. The lower the number is, the better it is as it explains fewer differences. The error of an observed value is the deviation of the observed value from the true value of a quantity of interest, and the residual of an observed value is the difference between the observed value and the estimated value of the quantity of interest (Hair, et al. (2014: p. 579). The mean on residuals is 0.00000, which suggests no differences between the estimated and observed mean and is quite respectable (Figure 5.7).

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	15281,2637	40552,8906	28917,5942	7520,56387	22
Residual	-9997,95410	11629,39063	,00000	6050,48968	22
Std. Predicted Value	-1,813	1,547	,000	1,000	22
Std. Residual	-1,487	1,729	,000	,900	22

a. Dependent Variable: Quantityimport

Figure 5.7: Residual Statistics

Regression analysis

The analysis of demand for smoked salmon in France is conducted by an estimate demand function using price, GDP per capita and substitute prices as explanatory variables. A regression analysis was conducted by using real GDP per capita and real prices in order to obtain the most valid results. Afterwards, several regression analyses were conducted using fresh salmon fillet as substitute to improve the reliability and validity of this study. Furthermore, with the few observations in the data, it is a challenge to acquire results with Durbin-Watson of 2 and significant at a 95% confidence interval in the same analysis. Several techniques have been attempted such as lagging, the use of first-order autoregressive model (AR) and moving average (MA). The different analyses and variables are found in Appendix 10. The analyses show a rather high R square value, which could be a result of positive autocorrelation as mentioned in the methodology. The estimated equation in this thesis is shown in chapter 3 and given by:

$$\textbf{(3)} \quad \mathbf{Ln\ Q_t = A + \beta_1 Ln\ P_t + \beta_2\ Ln\ Y_t + \beta_3\ Ln\ P_{s_t} + \epsilon_t}$$

Regression 1: Price, income and fresh salmon fillet (substitute)

The coefficient of determination shows how much variance the variables share. This is known as the R square and is shown in Figure 5.8. An approach that can be taken is multiplying the R square by itself. The regression analysis, using salmon fillet as a substitute, has a R square value of 0.956 which means that "Price", "GDP per capita" and "Substitute, salmon fillet" explain 95.6 % of the variance in "Volume". 95.6% x 95.6% = 91.39%, and the variables share 91.39% variance. The adjusted R Square is a slightly lower number with a value of

0.943. The adjusted R square takes the sample size and number of independent variables in the regression model into account. The adjusted R square tries to correct the R square value and is normally used when the sample size is small.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,978[a]	,956	,943	,09682	1,491

a. Predictors: (Constant), dummy2013, Dummy2010, LNrealgdpercap, LNrealsubfiletsalmon, LNrealpriceimport

b. Dependent Variable: LNquantityimport

Figure 5.8: Model Summary, fresh salmon fillet (substitute)

Looking at the ANOVA (Figure 5.9), the F-value is 69.930 and has 5 degrees of freedom, meaning it is a good model fit. The significance is .000 which tests the null hypothesis that multiple R in the population equals 0, and is statistically significant (Pallant, 2016: p. 179). The model fit is good in terms of the sample size in this thesis.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,278	5	,656	69,930	,000[b]
	Residual	,150	16	,009		
	Total	3,428	21			

a. Dependent Variable: LNquantityimport

b. Predictors: (Constant), dummy2013, Dummy2010, LNrealgdpercap, LNrealsubfiletsalmon, LNrealpriceimport

Figure 5.9: ANOVA, fresh salmon fillet (substitute)

Furthermore, to compare the contribution of each independent variable, we will look at the Standardized Coefficient Beta Values (Figure 5.10). GDP per capita has a value of 1.274, which means that this independent variable has the largest contribution for explaining the dependent variable (Volume). The values should preferably be above 0.3, which the independent variables are not. The significance level of the independent variables should be less than 0.05. Price, GDP per capita and substitute price have lower values than 0.05, making them all statistically significant. The VIF values and Tolerance values are not perfect, as GDP per capita and product price has VIF values that are higher than 10 and Tolerance value lower

than 0.1. Tolerance is an indicator of how much of the variability of the specified independent variable is not explained by the other independent variables in the model. The calculation can be made easily as the formula is 1 – R Squared for each variable. The VIF value is the inverse of Tolerance, and as the values does not fulfil the criteria of having a lower VIF than 10 and higher Tolerance than 0.1, multicollinearity is present (Pallant, 2016: p. 160). To test the regression analysis of autocorrelation, the Durbin-Watson statistic is used. The value is 1.491, which indicates some sort of positive autocorrelation in this analysis.

By conducting a regression analysis with all variables transformed into a natural logarithmic form, the elasticity of all explanatory variables is explained and transformed into a linear model (Econbrowser, 2014). According to the results, the price elasticity of demand is -1.901, and suggests that a 1% increase in price leads to a 1.901% decrease in demand. In addition, the income elasticity is 3.232, meaning that a 1% increase in income leads to a 3.232% increase in demand for smoked salmon. The cross-price elasticity is 0.459, which suggest that a 1% increase in substitute price leads to a 0.459% increase in the demand for smoked salmon.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-18,432	3,784		-4,871	,000		
	LNrealgdpercap	3,232	,464	1,274	6,970	,000	,082	12,222
	Dummy2010	-2,551	,265	-1,346	-9,610	,000	,139	7,173
	LNrealpriceimport	-1,901	,459	-1,065	-4,138	,001	,041	24,241
	LNrealsubfiletsalmon	,459	,196	,271	2,349	,032	,205	4,876
	dummy2013	,426	,106	,225	4,028	,001	,878	1,139

a. Dependent Variable: LNquantityimport

Figure 5.10: Coefficient, fresh salmon fillet (substitute)

Regression 2: Price and income

The second regression analysis tests whether price and income influence the demand of smoked salmon. Figure 5.11 shows an adjusted R square value of 0.879. The Durbin-Watson of 1.325 is lower than the recommended value of 2, indicating there is positive autocorrelation present.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,947[a]	,896	,879	,14049	1,325

a. Predictors: (Constant), Dummy2010, LNRealGDPperCap, LNRealPriceImport

b. Dependent Variable: LNQuantityImportDomestic

Figure 5.11: Model Summary, no substitutes

Further, the F-test is significant at a 95% confidence interval with three degrees of freedom, suggesting a good model fit. The ANOVA model is presented in Figure 5.12.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,072	3	1,024	51,888	,000[b]
	Residual	,355	18	,020		
	Total	3,428	21			

a. Dependent Variable: LNQuantityImportDomestic

b. Predictors: (Constant), Dummy2010, LNRealGDPperCap, LNRealPriceImport

Figure 5.12: ANOVA, no substitutes

The coefficients are illustrated in Figure 5.13. Income is significant, whereas price is not. The VIF and Tolerance values for income are acceptable, indicating no signs of multicollinearity. The price variable shows small signs of multicollinearity on both VIF and Tolerance. The Dummy variable is included due to the absence of data on French domestic production in 2010. Smoked salmon can be perceived as a luxury product and an increase in income will therefore naturally increase the demand. Similarly, price changes will influence demand.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-12,748	4,893		-2,605	,018		
	LNRealGDPperCap	2,460	,586	,970	4,202	,001	,108	9,254
	LNRealPriceImport	-,790	,435	-,443	-1,814	,086	,097	10,343
	Dummy2010	-1,983	,268	-1,046	-7,388	,000	,287	3,484

a. Dependent Variable: LNQuantityImportDomestic

Figure 5.13: Coefficients, no substitutes

Hypothesis

Based on the results obtained from the quantitative analysis, all hypotheses have been tested, and the results can be found in Table 3.

Hypothesis	*Remark*
H1: The demand for smoked salmon is price-elastic	Accepted
H2: The demand for smoked salmon is income-elastic	Accepted
H3: Fresh salmon fillet has a substitution effect for smoked salmon	Accepted

Table 3: The results of hypothesis testing

6 DISCUSSION

This chapter discusses the findings in accordance to theory and the results from the qualitative and quantitative analyses. The aim of this study was to investigate factors affecting the demand for smoked salmon in France, and variables such as price, income and different substitute products were tested in regression analyses. Further, RQ2, RQ3 and RQ4 will be discussed by interpreting the results from the qualitative part of this study. By assessing qualitative and quantitative analyses, the process is triangulated which improves the validity of the results. Therefore, the results obtained are discussed in this chapter.

6.1 RQ1: How price and income sensitive is the demand for smoked salmon in the French market?

As mentioned in the background chapter, France has experienced an economic growth over the past years. Such growth has led to greater purchasing power for the consumers and an expansion in the market, as well as in the businesses involved. Further, smoked salmon is a traditional product that can be perceived as a luxury good. Therefore, investigating whether price and income has any effect on the demand for smoked salmon in France may lead to interesting findings. This research question will be discussed by interpreting the results of the quantitative regression analyses and taking the appropriate theories into account. The main regression analysis in this study takes price, income and fresh salmon fillet into account and is followed by an analysis without any substitute products.

According to the results obtained from the main regression analysis, smoked salmon in France is both price and income elastic which supports hypothesis H1 and H2. In relation to price elasticity, a 1% increase in price leads to a 1.9% decrease in demand and is therefore elastic. Thus, according to the analysis, the French market for smoked salmon is price sensitive. This is in line with the results from the qualitative analysis, as the respondents indicated price as being vital to the demand. However, this depends on the price segment of the specific product, as the prices of the products range from very low to very high. The income elasticity is measured by GDP per capita and explains that a 1% increase in income leads to a 3.2% increase in demand. The income elasticity is rather high, which could be due to smoked salmon being a luxury good rather than a necessity. Luxury goods are products with income elasticities higher than one. In other words, for luxury goods, the proportion of household

budget allocated increases as the household income increases (Kemp, 1998). Xie and Myrland (2011) used a monthly time series from 2005 to 2009, and aggregated household demand rather than trade data. Thus, the difference between the findings could be explained by this. They found an expenditure elasticity of 1.638%, which further supports the claim that smoked salmon is a luxury product. Further, their paper found a price elasticity of –1.320% for smoked salmon, which is slightly lower than our results in the main analysis, but larger than the analysis that exclude the substitute product. Nonetheless, the price and income elasticity found in this thesis seem to be relatively high and should be treated with caution. The interview respondents noted that income would have some effect but pointed out the different price segments for consumers. Generally, they all agreed more income equals more purchasing. Smoked salmon is a high-end product normally consumed as a traditional meal at festive and holiday seasons (EUMOFA, 2016a), which was also confirmed by the interviewees from France. In addition, a rather large share of those who consume smoked salmon throughout the year are affluent. An increase in income may suggest greater demand by the middle class and families, which is supported by our income elasticity. One of the barriers for demand is indeed the seasonal trend, but it is also dependent on the consumers' life situation and status (EUMOFA, 2016a). By increasing the income of the population, the barriers and trends related to high-end products may change and it could become a product that is more applicable to a bigger market share. According to Pindyck and Rubinfeld (2013: p. 69), the consumer behaviour theory states that changes in price and income will affect demand and this is supported by our results. A theory of price elasticity says that loyalty is a factor that affects the consumers' price sensitivity. Loyal consumers will generally not be affected by price changes as much as consumers that are not loyal (Krishnamurthi and Papatla, 2003). The interviewees both in France and Norway discussed the importance of price and that consumers in this industry are highly price sensitive as discussed earlier. Establishing loyalty is not necessarily easy.

Fresh salmon fillet as a substitute product was tested and analysed in our regression analysis. The cross-price elasticity suggests that a 1% increase in substitute price leads to a 0.459% increase in demand for smoked salmon in addition to being significant at a 5% level (0,032). As a result, fresh salmon fillet has a substitution effect on smoked salmon and is not complimentary as an increase in price of the substitute product does not lead to a decrease in demand for smoked salmon (Pindyck and Rubinfeld, 2013: p. 70). According to our interviewees, the price point of smoked salmon generally does not change as frequently as, for

instance, those for whole salmon or fillet tend to. As a result, when the prices increase, and demand decreases for the substitute product, the procurer of smoked salmon has already assured a specific price leading to no immediate changes in consumer prices for smoked salmon. This is often done by back to back contracts, where the price / volume of the raw material and finished product is locked through contracts (Fishpool, 2017). While the substitute prices may change more rapidly depending on the current spot price, smoked salmon is more long-term specific in terms of price changes. Every interviewee noted that price is the most important factor affecting the demand for smoked salmon, in addition to sensitivity in relation to scandals and image.

The results present high VIF values and could be due to the deflator used when adjusting both prices and income for inflation. In the regression analysis, a dummy variable for year 2010 was conducted due to no available data on French domestic production that year. In addition, a considerable increase in French domestic production in 2013 compared to all the other years in our time-series affected our results. Therefore, a dummy variable for 2013 was also added in the regression analysis for salmon fillet as a substitute. The interviewees in France indicated a TV report to have had a significant negative effect on the demand for smoked salmon (Girard, 2013), which is also reported by EUMOFA (2016a). However, as this scandal occurred in the last quarter of the year, in November, this effect could have been negated by the tradition of eating smoked salmon during holidays. Thus, the effect on production may not have been visible before Q1, 2014. Furthermore, the contracts for these months were most likely already set and they may have been impossible to renegotiate. This is supported by the statistics obtained, which show roughly a 30% decrease in domestic production and imports during 2014. According to Asche and Bjørndal (2013: p. 136) food scares does not tend to be protracted, and consumers seem to have short memories in this respect. Thus, the market in France seem to be normalised since the scandal. Several factors influence the market size, in particular price and income. If the price of a good is reduced, a product will become more attractive and bought in greater quantities. Further, an increase in income will affect products differently. Luxury products such as smoked salmon will be affected more by an income increase than staple foods. For traded goods, such as salmon, currency and exchange rates are other factors that affect demand as they influence the relative buying power between countries (Asche and Bjørndal, 2013: p. 121). If the local currency for a buyer appreciates, the buyer power will be strengthened, which leads to an increase in both market size and demand due to a lower price. However, if an exporter's currency appreciate, prices in the importers' currency

increases and thus demand is reduced. This results in a negative shift in market size (Asche and Bjørndal, 2013: p. 121). These factors are supported by our results in the regression analysis, as well as being further backed up by the interviewees. As mentioned in the methodology, a (very conservative) rule of thumb is that the Durbin–Watson test should have statistics between 1 and 3, where values close to 2 indicate no autocorrelation. The Durbin–Watson test has a value of 1.562, which indicates positive autocorrelation.

There are static parameters in terms of the coefficient of determination for both analyses conducted in this study. The independent variables explain a high percentage of variety in terms of the dependent variable, which shows that the variables used are appropriate for the study. Autocorrelation might be an explanation for the two regression analyses having coefficient of determination values around 0.9. The main differences are the elasticities. Particularly, the price elasticity in the model without substitutes are inelastic, which might be due to different consumer patterns as well as lack of data in the time series. The results obtained might have errors if a variable excluded in the analyses should originally be included. Therefore, the reliability of the study will be affected, which should be taken into consideration. In addition, multicollinearity can be seen in both models which is due to the use of a deflator as explained earlier.

To conclude, the demand for smoked salmon is both price elastic and income sensitive. In addition, fresh salmon fillet has a positive substitution effect on smoked salmon, which is confirmed and tested in our regression analysis. As smoked salmon is perceived to be a luxury product, price and income are therefore the two main factors that are in focus both B2B and B2C. However, there are other factors that will influence the demand, which will be discussed in the next research question.

6.2 RQ2: Does Country of Origin have any effect on French consumer choices?

Smoked salmon consumption in France is based on a long history and traditions. As stated in the theoretical chapter, demand is highly related and influenced by consumer choices and preferences in a market. Further, French consumers are said to be aware and detail-oriented about different foods that are bought according to the interviewees from France. Therefore, CoO and CoO Image and whether they will influence consumer choices or not are interesting

topics for investigation. Thus, RQ2 will be discussed in a B2C context. The research question will be discussed with data from the qualitative in-depth interviews and secondary sources, including the use of appropriate theory that has been presented earlier in the thesis.

Pindyck and Rubinfeld (2013: p. 68) discuss three key factors related to the decision-making process: consumer preferences, budget constraints and consumer choices. These factors take volume, availability and income into account, where the consumer ranks the products based on their desires and satisfaction, and later chooses how much of each good they should buy. Our findings from both the qualitative and quantitative analysis suggest that price is an important factor which is influenced by budget constraints, but this will differ depending on the season. As noted earlier, during festive meals such as Christmas, smoked salmon is a product that be may be preferred. The price might be less in focus at these times, but consumers will go through a decision-making process to find the best option. The rest of the year, the interview objects stated that price is the essential factor to consider and will highly determine which product will be bought. One of the interviewees in France said "*my consumption of smoked salmon increased outside of the Christmas season when I got a decent job with a stable income*". These factors can determine consumer behaviour, which is not always rational according to theory. Consumers are easily affected by image, as well as family and friends' perception of a product or brand.

As reported by NSC France (2016), the older section of the population is the largest segment of consumers of smoked salmon. Several factors need to be considered when analysing these results, but a focus on health, time available, as well as a stable income could explain why older people consume more than the younger section of the population. Furthermore, the product variety of smoked salmon in France is great, which makes different variations and packages available for consumption in different type of meals. Different smoked salmon products in France can be seen in Appendix 3. Sushi has become a trendy meal and applies to the younger part of the population. Such trends can help increase the everyday consumption of smoked salmon, although the volume of smoked salmon in a meal of sushi is rather low. NSC France (2016) has investigated this and have found that this consumer segment consumes more now than in the past, which supports the statements of the interviewees regarding trendy products. Therefore, age, taste and trends are factors related to consumer choices that should be considered. Further, CoO and country image will be discussed.

As stated by NSC France (2016), CoO influences French consumers. This is further supported by the qualitative analysis, as both the Norwegian respondents and French respondents interviewed agreed CoO affects the demand for Norwegian salmon in a positive way. One of the Norwegian interviewees said, "we are selling Norway; not the salmon". Another commented on how the French consumers could be affected by the availability of the different origins, and said CoO is important due to differentiation, and the fight for the best shelf location. The NSC actively work to promote Norway and ensure continued growth as an origin country in several markets, including France (Norges Sjømatråd, 2018a; Asche and Bjørndal, 2013: p. 134). According to the interviews conducted both in France and Norway, the NSC presence in the market has a positive impact, both in terms of promoting CoO and handling potential scandals. This is done through events, actively engaging with both firms and consumers in the market and more. As quoted by Bjørn Erik Stabell of NSC *"A good reputation can't be bought...but we can buy attention; which we have done"* (Berge, 2018). Some of the interviewees in Norway noted that they would like the NSC to focus more on the processing sector of Norway and the history of the industry, rather than primarily the aquaculture and farming.

The Seafood Consumer Index (SCI) by NSC (2017), using a sample of 4,045 consumers, reported that 13% of French consumers considered the CoO to be extremely important when buying seafood, 29% considered it to be very important, 31% considered it to be important, 15% considered it to be somewhat important, and 11% found it to be unimportant in a purchase decision (Appendix 4e). Thus, most of the French consumers value CoO when making a purchase decision. On the other hand, Røra, Monfort and Espe (2004) found that French consumers showed no preferences in terms of CoO for cold smoked salmon, but noted subtle taste differences between Scottish, Irish and Norwegian farmed salmon. The French consumers seem to have good perceptions regarding Norwegian seafood and salmon, as shown in Appendix 4. Norway has a country image with perceptions related to attributes such as nature, cleanliness, eco-friendliness and having a cold environment. However, these perceptions do not seem to be transformed into positive associations as a CoO for salmon. Associations such as being a big-scale industry, exploiting natural resources, environmental issues and quality problems related to intensive farming and know-how affects the reputation negatively. This could be related to Norway being the biggest and the most known origin for farmed Atlantic salmon (Norwegian Seafood Council / Kantar TNS, 2018).

As discussed earlier, the interviewees in France noted CoO (or in this context, the country of farming) as influencing the purchase intention and choice of the consumers. However, the French interviewees stated that labels are also an important factor, perhaps even more than CoO at times. Labels such as Label Rouge are strongly preferred in the French market, and the preference towards CoO is highly image based and can change over time. According to Røra, Monfort and Espe (2004), 61% of French consumers consider a quality label to be either very important or important in their purchasing decision. The French consumers possesses information and knowledge about the industry and are therefore easily affected by scandals and the effects on image as discussed earlier in the paper. Studies have found familiarity with aquaculture and frequent seafood consumption to be determinant factors in preferences and willingness to pay. Furthermore, experience and knowledge about both consumption and production may affect the influential strength of CoO (Bjørndal et al., 2014). This is in line with the statements from the interviewees. This is also noted by Asche and Bjørndal (2013: p. 121), who claim negative reviews such as newspaper stories about the negative environmental impacts of salmon farming can lead to a reduction in demand. As discussed in theory, CSR is likely to be an increasing trend and create additional demand for the companies and products who exercise this, especially for fisheries and agriculture (Bjørndal et al., 2014). The labels communicate the product attributes and are thus likely to create a form of demand for this product, which is also in line with the perspective of the interviewees. However, ecolabels alone are just one factor affecting preferences and demand. Consumers need to be convinced that the methods of production and the firm focus on the environment, as there are concerns regarding sustainability through the entire process. If sustainability is recognised by the consumers, the firm has succeeded in affecting the decision-making process (Kreng and Huang, 2011).

Consumers create an image of the CoO based on price and quality, which affects the decision-making process when buying a product (Veale, Quester and Karunaratna, 2006). Røra, Monfort and Espe (2004) found that smoked salmon originating from Ireland and Scotland were about 30% more expensive than the Norwegian counterpart in French hypermarkets in 2001. This could encourage consumer perceptions that the smoked salmon with these origins is of a higher quality. EUMOFA (2016b) found the overall consumption of smoked salmon has decreased since 2016 in volume but not in terms of expenditure. This was due to the French choosing to reduce their consumption in favour of more expensive products, which could also be a consequence of the higher price equals higher quality perception.

As France has an already established industry and tradition, French consumers might feel a sense of ethnocentrism and patriotism towards domestically produced products. One of the interviewees noted “Why would we import? Our products are far superior”. According to Javalgi et al. (2005), French consumers do not appear to be overly ethnocentric, but do have a strong country image. They are willing to buy products from other countries but will be more likely to buy certain products because of the reputation of the CoO. Norway has a strong presence as a CoO for seafood for French consumers. However, as the French smokehouse industry is established and produces large volumes, a French consumer might prefer French smoked salmon, using Norwegian Atlantic salmon as raw material. Research conducted by NSC found that 65% of French consumers thought French products tasted better, and 60% thought that they were better quality. They also found three out of five consumers were willing to pay a higher price for a product if it was of French origin (Norwegian Seafood Council / Kantar TNS, 2018). This is in line with the response of the French respondents, who noted that they have seen this trend, and that ‘local’ food is both a trend and a tradition. A good example of this is the domestic trout production in France, which is becoming increasingly popular, even if the production volume is low. The trend for buying local food in Europe is noted by Bjørndal et al. (2014) as being heavily promoted.

In conclusion for RQ2, CoO influences French consumers and the decision-making process. However, whether such a preference is transferred to the processing country of smoked salmon is not certain. There are mainly three aquaculture countries relevant in this study, according to the interviews and literature: Ireland, Scotland and Norway. The Irish and Scottish seem to have a better reputation for their salmon than Norway. The interviewees noted that this might be due to the use of labels, the fact that Norwegian aquaculture is the largest and thus considered 'standard', or because of the price.

6.3 RQ3: How is the power relationship between supplier and buyer in the seafood industry?

As mentioned in the theory, power indicates that one party can decide the terms by which the transaction takes place; these could include properties such as price, quality, volume and more. The smoked salmon industry has multiple parties involved before the processed products end up with the final consumers, and this research question is therefore based on

B2B. It is important to investigate the relationship between supplier and buyer, with the aim of studying how different levels of power affect this relationship. In-depth interviews, findings from other research papers and appropriate theory are the basis of this section.

According to the qualitative analysis, the power relationship between supplier and buyer is skewed. The price of Atlantic salmon is closely related to supply and demand conditions, and as noted in the background chapter, is characterised as highly volatile. Furthermore, Asche and Bjørndal (2013: p. 120) note that the farmer will sell to the highest bidder. As a result, the prices in France will correlate with the prices offered in, for example, Japan and adjust thereafter. Thus, if there is a high level of demand for salmon in France and a low supply of Atlantic salmon, this could potentially lead to higher power for the farmer, as the different players in the market will increase the bid on the price. As noted in the theory, a firm can control both prices and the supply of components when their bargaining power is high, which ultimately will lead to greater market power. Furthermore, there is a high level of bargaining power for suppliers if the buyer is dependent on the input from the supplier. In the context of a smokehouse, this would indicate that the farmer has power over the processor, as their input is essential to their output. This is in line with the qualitative analysis conducted. By acquiring great bargaining power on the farmer's side, it could be possible to control and set high prices. In addition, an increased market size will increase the price from the producer of all the supply, as the demand schedule shifts outwards. As a result, the buyers will purchase more, which illustrates the importance of market size both on the demand side and the production side (Asche and Bjørndal, 2013). The interviewees noted that as fresh Atlantic salmon is a high demand product with relatively few suppliers, there is a 'fight for the raw material'. A small number of distributors leads to a lack of flexibility in terms of choosing suppliers. Therefore, the farmers will achieve additional power and profit from downstream and upstream firms (Hyvönen, 1995).

According to Lipczynski et al. (2013), buyer power, seller power and the oligopsony model can be connected. The oligopsony model suggests that there are few buyers in the market, which can be the retail chains, and a great number of sellers. As a result, the retail chains will gain advantage and bargaining power over the suppliers with the aim of getting the best contract. In addition, the buyer can both purchase and sell their products. The retailer has power over the processor/exporter, resulting in the prices being pushed down when purchasing the processed products. Afterwards, the products are sold to the final consumers in

the retail stores with a higher price, which empower the retailer on the seller-side. This means that they are doubling their reward by having power both on the buyer- and seller-side. This could especially be true for larger retail chains. Several of the interviewees noted the supplier as having definite power with regards to price, volume, and logistics. Other interviewees noted that the retail chain had a certain degree of power as well, as they have the option of 'walking away', whereas the smokehouse does not. The processor must agree to the price or lose the contract. This could result in the smokehouse, the party stuck in the middle, being pressured from both sides. Vertical coordination is a method of organising transactions and can be accomplished by using contracts. Contracts provide large processors with more options for using "power" than the depressed input prices, and thus input volume (Bonanno, Russo and Menapace, 2017). Some studies found no relationship between processor prices and the retail prices for smoked salmon in France, which generally indicates that the retailer could exercise a certain degree of power. However, it was not possible to come to a conclusion about this based on the statistical tests alone (SNF / Centre of Fisheries Economics, 2002).

Bargaining power is therefore a critical issue in this industry, as firms seek to improve terms and conditions through bargaining. A powerful firm will gain favourable terms from the other parties involved in the supply chain, and therefore increase performance (Crook and Combs, 2007). As a result, the power relationships in the industry are related to the next research question.

6.4 RQ4: How can Norway as a high-end seafood processor be more competitive in a large European market such as France in the smoked salmon industry?

Norway aims to be the world's leading seafood nation, and aquaculture is likely to be a significant driver for this (SjømatNorge, 2013). Most of today's salmon is sold as raw material, which consequently leads to lower value gained for Norway. As the raw material price, in this case Atlantic salmon, is around 70 to 80 per cent of the total operating costs, access to raw material at a stable, relatively low price seems to be essential for a Norwegian processor to be competitive in a B2B perspective (SINTEF Fiskeri og havbruk AS, 2014, see Appendix 5c). The profitability of the processing industry appears to be opposite proportional to the price of whole salmon. In periods with high spot prices for whole salmon, it seems to be hard to generate the required price on processed products for it to be profitable. (SINTEF

Fiskeri og havbruk AS, 2014). Some claim the issue is not the high salaries, but rather the lack of a stable access to raw material (Hofseth, 2017). One common suggestion to improve the access to raw material for the processors is "processing concessions". These are aquaculture earmarked for processing (Hofseth, 2017; Sæther, 2009). This could lead to a ripple effect throughout the seafood sector and increase the competitiveness of the processing industry. However, from a pure profit point of view, some argue against this, and some analyses show it is just not profitable to process salmon in comparison to exporting it whole, as the prices generated are too low for fillets (SINTEF Fiskeri og havbruk AS, 2014). According to the interviewees, another issue with the competitiveness of the Norwegian smokehouse industry in France is their level of domestic production. As discussed in RQ2 this could affect consumers through ethnocentrism and work as a barrier for Norwegian firms trying to penetrate the French market. However, this might not be an issue in European markets with lower domestic production.

As noted in the background chapter, there is currently a 13% tax on secondary processed salmon such as smoked salmon to the EU. This tariff comes into play when the quota of 450 tonnes is spent. On the contrary, there is a 2% tariff on whole salmon and fillet exported. This could be a significant disadvantage for Norwegian smokehouses and is reported by SINTEF / Kontali Analyse (2011) as the most important barrier. There appears to be potential for Norwegian smokehouses if this tax were to change, as they might have a competitive advantage due to access to raw material (volume, quality, freshness etc.), which could give Norway a foundation in the future for establising a good position in the EU market. The report notes there is a possibility from the politicians for a change in this policy. However, as the tariff is put in place to protect the EU's own processing industry, there might be difficulties pushing for change in this policy. They suggest the politicians work in a bilateral way towards a single market with big potential, as well as the EU on a general basis (SINTEF / Kontali Analyse, 2011). France could be an interesting market in this context, as discussed throughout this paper. The interviews conducted in Norway also indicated this. The interviewees elaborated on how tax-free quotas are generally not spent before the last quarter, if ever, due to there currently not being enough incentive to focus on this market. If there were no taxes, they would potentially dedicate more efforts to exporting to the EU, including France, even if this is likely to demand a lot of time. However, as it is today, they serve small niche markets which generally have higher demand during holidays, which is also evident by the seasonal peaks. Some exporters also note how the use of prod. quality salmon can

subsidise the taxes and costs to some extent, but not enough for them to be put in a competitive position in comparison with competing low-cost countries. They also noted the use of prod. quality salmon could have different yields, quality, and freshness.
According to an interview conducted with a major supplier of processor equipment, there is likely to be an increased level of automation in the future, which is in line with other reports on the subject (Sintef Fiskeri og havbruk AS, 2014; SINTEF / Kontali Analyse, 2011). Norway's trading partners had close to an average of 2.5 times higher electricity prices than Norway in 2013 (Appendix 5a), while labour costs in Norway are about 7.4 times higher than in Poland (Appendix 5b). These costs obviously affect how Norway positions itself as a processor. Due to the labour costs and cheap electricity, increased automation could be a potential source of competitive advantage if the level of staff required is sufficiently low. The environmental aspect of processing is relevant to consider when discussing the focus on automation for the future. Norway must exploit the biological raw materials to a greater degree, including focusing on innovation to improve old technology, as well as creating new and better solutions. Successful innovation in technology and exploitation of raw materials can advance the competitiveness of the country, along with meeting the futuristic needs of the market (SINTEF Fiskeri og havbruk AS, 2014).

One of the interviewees in France also noted this to be an interesting possibility: automated factories, where fillets are supplied directly from an automated factory in Norway. This could lead to lower transport costs and a lower carbon footprint. A major player in Norwegian aquaculture is currently investing 700 million NOK in such a setup, and mentions several advantages such as higher volumes, lower costs, reduced wear and tear on the workforce, as well as less need for staff and fewer language barriers (Furuset, 2017). One issue this could raise, is a decline of FTEs in the seafood processing industry in Norway. An increased level of automation could lead to most of the workers in the seafood processing industry becoming obsolete because of their lack of knowhow in automation and engineering. In addition, there will be less need for employees with a fully automated setup (SINTEF Fiskeri og havbruk AS, 2014). The effects of this could and should be discussed further in another paper.

Another option could be niche marketing. According to Winther et al. (2011), there are opportunities for smoked products in a niche market aimed at high paying consumers. This could outweigh some of the disadvantages discussed above; finding a potential highly paying niche for a unique product. A French start-up company has released its own niche product,

which has the taste and texture of smoked salmon, but is a plant-based vegan product made of microalgae (Francetvinfo, 2018). This shows how niche products could increase demand in the future. As discussed earlier, labels might be effective with French consumers, and products with unique traits such as ecological, smoked in a particular way, or with a particular history, are potentially effective tools for capturing market shares. There are some Norwegian firms who have positioned themselves in a niche market in the EU even if they are at a disadvantage due to taxes and higher costs. However, this seems to be a smaller issue in such niche markets (SINTEF / Kontali Analyse, 2011). Toften (2005) notes niche marketing is generally most suitable for smaller companies, as they can customise the products for the specific customer in a quicker and more effective manner. This in turn can generate higher prices, and thus, value. Furthermore, he argues the opportunity for successful differentiation will often lie on the product side for Norwegian seafood, as the competitive advantage of Norwegian producers is usually that they have access to fresh and high quality raw material. One example of successful niche marketing is Balik, which sells their smoked loin products for a price between 200 to 700 EUR per kg (Versandmagazin, 2018).

Other example of differentiation in France included trout / salmon farmed and smoked in France, where they were able to receive a premium price, as high as £88 per smoked fillet (Saumon de France, 2018). The French interviewees thought that this was a popular product that was in demand. This could be a result of the consumers' ethnocentrism. However, the volume of this product is not comparable to the Norwegian aquaculture or farmed salmon from other origins, as they are reported to have a volume of about 50 tonnes WFE in 2016 (Kontali, 2017b). According to theory, there are several criteria for a successful niche market, such as sufficient size, no real competitors, growth potential, consumer's purchasing ability, the need for special treatment, a high level of goodwill, and opportunities for an entrance company to exercise its superior competence. Locating a market with all these distinctive qualities might be an issue, but potentially highly profitable.

RQ1 and RQ2 shows there is potential for Norwegian secondary processed products in France. RQ3 elaborates on the power relationship in the supply chain, and RQ4 showcases some barriers as well as possibilities in the EU. Among the barriers are high salaries, tariff taxes and competition from other countries, especially low-cost countries such as Poland. However, due to the electricity price level of Norway, automation is elaborated on as a potential source of competitive advantage. Another option could be establishing high paying

niche markets or pushing for the politicians to change the regulations to further favour the secondary processing industry. It seems like none of these options are possible without allocating relatively high amounts of resources as well as time. Lastly, goodwill and greater focus from the politicians seem to be essential.

7 Limitations and suggestions for further research

The aim of this study was to examine the demand for smoked salmon in Norway, how CoO affects the consumers, the power relationship in the supply chain of processors, and finally elaborating on Norway's position as a seafood processor, the potential and how this position can be improved. Although the study contributes to both practice and theory, there are certain limitations that must be acknowledged.

There is limited research on some of the topics, particularly on smoked salmon in this context. Furthermore, there may have been some language barriers when interacting with the French respondents, as neither of the interviewers spoke French. There might have been some issues with probing the respondents to properly extract all the information regarding all the subjects due to our inexperience in conducting interviews. Additionally, there was limited time and resources for arranging the interviews and conducting them. Ideally, the data should have a longer time-series, but no such data has been identified for both trade data and French domestic production. Prior to year 2002, the data available was in ECU (European Currency Unit), due to France switching to EUR rather than FRF in that year. This could affect the results, as they might not be as accurate as they would have been if everything had been in EUR. The data was collected by Eurostat and extracted by NSC, meaning the authors have no real way of verifying the accuracy of the conversion. Data for domestic production of smoked salmon in France was not available for 2010. According to Xie and Myrland (2011), it is 'impossible' to conduct such demand analyses for smoked salmon using trade data, as it is mainly processed locally using imported fresh salmon. Thus, the analyses could have different results if aggregated consumer demand for fresh and smoked salmon were used.

The following suggestions for further research are based on the research done in this thesis: Multiple sources were available regarding import / export statistics and choosing the most accurate one was a case for discussion. Thus, the results would differ depending on the sources used. In addition, the results might have been different if more substitute products were included. Therefore, further research could be based on using other sources and substitute products, making the use of the AIDS model possible. Another potential source of knowledge is conducting the same analysis as in this paper using a monthly time series rather than yearly. This might give different results due to more observations. Further and more

extensive research on the power balance between the supplier and buyer in the processing industry should be done, as this seems to be an unexplored subject.

The Norwegian processing industry faces several implications regarding export to the EU as discussed in the thesis and is a topic for further research on its own as the matter is quite complex. This research could also have been conducted in more European markets, such as Germany, Denmark or elsewhere in order to attain a greater depth and breadth in the study. Furthermore, studying how the intra-trade within the EU and the use of hubs affects the smoked salmon industry could potentially lead to interesting finds. Another interesting study is investigating the effects of automation in the aquaculture industry, and how it affects the workforce / FTEs in Norway.

8 Conclusion

The study examines the demand for smoked salmon in France through trade data from the UK, Poland, Germany, Denmark and Norway as well as French domestic production. This data is used to study the price elasticity, income elasticity and the substitution effect of fresh salmon fillet in relation to smoked salmon (RQ1). The study elaborates further how CoO affects consumers in France in a B2C context, considering both smoked salmon as well as seafood in general (RQ2). This question is answered through secondary data and a qualitative study. To highlight the power balance in a buyer and supplier relationship in the salmon secondary processing industry, qualitative data is used in addition to relevant theory (RQ3). Lastly, relevant reports, literature and qualitative data gives an overview of the current barriers and possibilities for the Norwegian secondary processing industry in relation to EU markets (RQ4).

The results of the quantitative analysis determine how price, income and substitute product has an effect and influence on demand for smoked salmon in France. Smoked salmon can be perceived to be a luxury product, which is supported by having an income elasticity of greater than one. The result from the in-depth interviews had price as a constant factor that influences demand, which is supported by our regression analysis by acquiring a positive price elasticity. Therefore, price and income are evident factors that influence demand. Furthermore, there is a negative relationship between price and demand, and a positive relationship between income and demand for the regression analyses conducted. Further, fresh salmon fillet is found to have a substitution effect on smoked salmon, as there is a positive relationship between substitute price and demand.

RQ2 focuses on CoO in a B2C context. The study finds that CoO influences French consumers' choice regarding smoked salmon. The qualitative research highlighted Norwegian salmon as a preference, but several of the interviewees in France noted that Scottish or Irish salmon had a better reputation. Further, French consumers are likely to have some ethnocentric tendencies in terms of smoked salmon. Labels seem to be an effective tool for communicating the different attributes, such as CoO, to French consumers. The study also finds that the average French consumer has a relatively high level of knowledge and interest in the food they consume. Secondary data is used to build a foundation regarding the beliefs of French consumers.

RQ3 studies the power balance in the buyer / supplier relationship in a B2B situation. In relation to power balance in the context of a smokehouse, the farmer is considered the supplier and the retailer is considered the buyer. The study finds both supplier and buyer to have a high level of power, where the smokehouse may experience pressured margins from both ends. As Atlantic salmon is a high demand product with few suppliers, a high level of bargaining power could be the case. Buyers are identified as having a certain amount of bargaining power.

The review of the current position of the Norwegian processing industry shows significant barriers in the EU for Norwegian smokehouses. Among these are high salaries, high tariff burdens and high competition from other countries, especially low-cost countries in the EU. Several possibilities are highlighted, including increased automation, focusing on niche markets, and changes to the current regulations at a political level. However, none of these options seem to be possible without a significant amount of resources and time, as well as goodwill from the politicians, both domestically and internationally.

9 References

Asche, F. and Bjorndal, T. (2013). The economics of salmon aquaculture. Hoboken, N.J.: Wiley.

Asche, F., Dahl, R., Gordon, D., Trollvik, T. and Aandahl, P. (2011). Demand Growth for Atlantic Salmon: The EU and French Markets. *Marine Resource Economics*, 26(4), pp.255-265.

Bailey, J. (2008). First steps in qualitative data analysis: transcribing. *Family Practice*, 25(2), pp.127-131.

Bajpai, R. and Bajpai, S. (2014). Goodness of Measurement: Reliability and Validity. *International Journal of Medical Science and Public Health*, 3(2), p.112.

Berge, A. (2018). – *Omdømme kan ikke kjøpes*. [online] iLaks. Available at: <https://ilaks.no/omdomme-kan-ikke-kjopes/> [Accessed 3 Apr. 2018].

Bjørndal, T., Fernandez-Polanco, J., Lappo, A. and Lem, A. (2014). CONSUMER TRENDS AND PREFENCES IN THE DEMAND FOR FOOD. *Centre for Applied Research at NHH,* Working Paper (No. 17/14).

Brooks, C. (2002). *Introductory econometrics for finance*. Cambridge: Cambridge University Press.

Bonanno, A., Russo, C. and Menapace, L. (2017). Market power and bargaining in agrifood markets: A review of emerging topics and tools. *Agribusiness*, 34(1), pp.6-23.

Brækkan, E. and Thyholdt, S. (2014). The Bumpy Road of Demand Growth—An Application to Atlantic Salmon. *Marine Resource Economics*, 29(4), pp.339-350.

Brockwell, J. P. and Davis, R. A (1991). Time Series: Theory and Methods. Colorado: Springer.

Chisik, R. (2002). REPUTATIONAL COMPARATIVE ADVANTAGE AND MULTINATIONAL ENTERPRISE. *Economic Inquiry*, 40(4), pp.582-596.

Crook, T. and Combs, J. (2007). Sources and consequences of bargaining power in supply chains. *Journal of Operations Management,* 25(2), pp.546-555.

Dalgic, T. and Leeuw, M. (1994). Niche Marketing Revisited: Concept, Applications and Some European Cases. *European Journal of Marketing.* 28(4).

de Perlinghi, M. G. and Pettersen, I. K. (2017). *Markedsutvikling for torskefisk i Frankrike*. Norges Sjømatråd.

Doyle, A. (2016) *Norway satisfies EU smoked salmon appetite through Polish back-door* [online] Available at: <https://www.reuters.com/article/us-britain-eu-norway-salmon/norway-satisfies-eu-smoked-salmon-appetite-through-polish-back-door-idUSKCN0WI1VJ> Accessed: 11.01.2018

Econbrowser.com. (2018). *Use of logarithms in economics | Econbrowser*. [online] Available at: <http://econbrowser.com/archives/2014/02/use-of-logarithms-in-economics> [Accessed 17 Apr. 2018].

Eumofa (2016a). Smoked salmon in France. Price structure in the supply chain. [online] Available at: <https://www.eumofa.eu/documents/20178/97023/Price+structure_Smoked+salmon+in+FR.pdf/bb2c0ea3-53d7-4cca-a4ad-a349982a2cf1>. Accessed 08.01.2018

Eumofa (2016b). *No. 01/2016. Monthly Highlight*s. [online] Available at: <https://www.eumofa.eu/documents/20178/22933/Monthly+Highlights+-+No.+2016.pdf/1022b321-b6ec-4bfa-90d5-ce6f347a1c3d> Accessed 26.04.2018

Eurostat (2012) *No. 58/2012. Fisheries and Aquaculture in Europe.* [online] Available at: <https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/salmon_en.pdf> Accessed 03.05.2018

Everyculture (2001). Culture of France - Orientation, history and ethnicity [online] Available at <http://www.everyculture.com/Cr-Ga/France.html> Accessed: 08.01.2018.

FAO (2018a) *Seafood consumption by country per capita, comparison* [online] Available at: <http://www.fao.org/faostat/en/#compare> Accessed: 16.01.2018

FAO (2018b) *FAO Fisheries & Aquaculture National Aquaculture Sector Overview (NASO).* [online] Available at: <http://www.fao.org/fishery/countrysector/naso_france/en> [Accessed 5 Feb. 2018]

Field, A. (2009). Discovering Statistics Using SPSS (and sex, and rock 'n' roll). 3rd ed. SAGE Publications Ltd.

Fishpool (2017) Rish management and contracts - seminar. [online] Available at: <http://fishpool.eu/wp-content/uploads/2017/11/Risk-management-and-contracts-by-Arne-Aarhus-Ocean-Quality.pdf> Accessed: 10.04.2018

Framstad, P. A. (2018). *Derfor sendes det mindre norsk laks til Europa*. [online] E24. Available at: <https://e24.no/boers-og-finans/oppdrett/derfor-sendes-det-mindre-norsk-laks-til-europa/23914958> [Accessed 16 Jan. 2018].

FranceAgriMer (2016) *The fisheries and aquaculture sector in France*

Francetvinfo (2018) *Innovation une startup bordelaise lance le saumon fume vegan* [online] Available at: <https://www.francetvinfo.fr/societe/veganisme/innovation-une-startup-bordelaise-lance-le-saumon-fume-vegan_2691360.html> Accessed 09.04.

Furuset, A. (2017). *Ingen mennesker skal røre Lerøy laksen*. [online] intrafish.no. Available at: <http://www.intrafish.no/nyheter/1277947/ingen-menneskehender-skal-rore-leroy-laksen> [Accessed 6 Apr. 2018].

Girard, L. (2013) *Alerte rouge sur le saumon* [online] Available at: <http://www.lemonde.fr/economie/article/2013/12/22/alerte-rouge-sur-le-saumon_4338805_3234.html> Accessed: 23.04.2018

Hair, J., Black, W., Babin, B. and Anderson, R. (2014). *Multivariate data analysis*.

Henriksen, E. and Bendiksen, B. (2008). Rammebetingelser for lønnsomhet i norsk fiskerforedling. Empiriske funn og kunnskapshull. *Økonomisk fiskeriforskning*, [online] 18. Available at: <http://okonomiskfiskeriforskning.no/wp-content/uploads/sites/4/2014/05/Rammebetingelser-for-lonnsomhet-i-norsk-fiskeforedling.pdf> [Accessed 9 May 2018].

Hofseth, R. (2017) Intrafish: *Norsk laks går på billigsalg.* [online] Available at: <http://www.intrafish.no/kommentarer/1404038/norsk-laks-gaar-paa-billigsalg> Accessed 11.04.2018.

Hustadnes, H. (2018). Kontali Analyse. Omregningsfaktor. [email].

International Monetary Fund (2016). France: Selected Issues. *IMF Staff Country Reports*, 16(228).

Jensen, M. and Drozdenko, R. (2008). The changing price of brand loyalty under perceived time pressure. Journal of Product & Brand Management, 17(2), pp.115-120.

Kemp, S. (1998). Perceiving luxury and necessity. *Journal of Economic Psychology*, 19(5), pp.591-606.

Kontali Analyse / Eurofish (2017). *Vareflyt sjømat til Frankrike: Laks, ørret, torsk, hyse, sei, sild, makrell og reker av norsk opprinnelse*.

Kreng, V. and Huang, M. (2011). Corporate Social Responsibility: Consumer Behavior, Corporate Strategy, and Public Policy. *Social Behavior and Personality: an international journal*, 39(4), pp.529-541.

Krishnamurthi, L. and Papatla, P. (2003). Accounting for heterogeneity and dynamics in the loyalty-price sensitivity relationship. Journal of Retailing, 79(2), pp. 121-135

Lantos, G. (2001). The boundaries of strategic corporate social responsibility. *Journal of Consumer Marketing*, 18(7), pp.595-632.

Lee, N. and Lings, I. (2013). *Doing business research*. Los Angeles: Sage.

Lem, a., Bjorndal, T., Lappo, A. (2014). *Economic analysis of supply and demand for food up to 2030 - Special focus on fish and fishery products*. FAO Fisheries and Aquaculture Circular. Rome: Audun Le, p.1.

Lipczynski, J., Wilson, J., Goddard, J. and Wilson, J. (2013). *Industrial Organization*. Harlow: Pearson Education UK.

Louise Barriball, K. and While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing*, 19(2), pp.328-335.

Løvdal, T. (2015). The microbiology of cold smoked salmon. *Food Control*, 54, pp.360-373. Accessed: 08.01.2018

Marine Harvest (2017). *Salmon Farming Industry Handbook.* [online] Available at: <http://marineharvest.com/globalassets/investors/handbook/salmon-industry-handbook-2017.pdf> Accessed 09.01.2018

Mattilsynet (2018) *Fishery establishments* [online] Available at: <https://www.mattilsynet.no/om_mattilsynet/godkjente_produkter_og_virksomheter/fish_and_fishery_products/virksomheter_som_haandterer_fiskerivarer__fishery_establishmentspdf.17014-517/binary/Virksomheter_som_haandterer_fiskerivarer_-_Fishery_establishments.pdf> Accessed: 09.05.18

Nasdaq. (2018). *Seafood*. [online] Available at: <http://www.nasdaqomx.com/transactions/markets/commodities/markets/seafood> [Accessed 9 Jan. 2018].

NationMaster (2014) *Economy: France and United Kingdom compared.* [online] Available at: <http://www.nationmaster.com/country-info/compare/France/United-Kingdom/Economy> Accessed: 16.01.2018

Norges Sjømatråd. (2017). *Rekordår for hvitfisk for tredje året på rad*. [online] Available at: <https://seafood.no/aktuelt/nyheter/rekordar-for-hvitfisk-for-tredje-aret-pa-rad/> [Accessed 16 Jan. 2018].

Norges Sjømatråd. (2018a). Om oss. [online] Available at: <http://seafood.no/om-norges-sjomatrad/om-oss> [Accessed 10 Apr. 2018].

Norges Sjømatråd. (2018b). *Tolltariff til EU 2018*. [online] Available at: <https://seafood.no/markedsadgang/toll/tolltariff-til-eu-2018/> [Accessed 25 Apr. 2018]

Norwegian Seafood Council / Kantar TNS (2018) *Understanding the market position for Norwegian salmon in France: Qualitative insights report*.

NSC France (2016). *Seafood study 2016 insights and outlook: The French & seafood* [online] Available at: <https://seafood.no/contentassets/6b8fa7b9742b4b0d9b2cc4a8d87af7a5/french-seafood-study.pdf> Accessed: 11.01.2018

Nærings- og fiskeridepartementet (2012). *Verdens fremste sjømatnasjon*. [online] Available at: <https://www.regjeringen.no/no/dokumenter/meld-st-22-20122013/id718631/> [Accessed 24 Jan. 2018].

OECD (2017). Developments in individual OECD and selected non-member economies <http://www.oecd.org/eco/outlook/economic-forecast-summary-france-oecd-economic-outlook.pdf> Accessed: 08.01.2018

Pallant, J. (2016). SPSS survival manual. Sydner: Allen & Unwin S, S. (2017).

Pedersen, T. (1981). *Prosesser og produkter i Norsk fiskeindustri. Bind 4. Tørking, salting og røyking*. Oslo: Universitetsforlaget.

Persson, K. (2015). *An economic history of Europe*. Cambridge: Cambridge University Press.

Phau, I. and Chao, P. (2008). Country-of-origin: state of the art review for international marketing strategy and practice. *International Marketing Review*, 25(4).

Pindyck, R. S. and Rubinfeld, D. L. (2013). *Microeconomics*. 8th ed. United State: Pearson Education Limited.

Porter, M. (1980). *Competitive strategy*. New York, [etc.]: The free press.

Regjeringen (2016) *En konkurransekraftig sjømatsindustri.* St. melding 10 (2015-2016) [online] Available at: <https://www.regjeringen.no/no/dokumenter/meld.-st.-10-20152016/id2461010/sec11> Accessed: 11.01.2018

Røra, A., Monfort, M. and Espe, M. (2004). Effects of Country of Origin on Consumer Preference of Smoked Salmon Collected in a French Hypermarket. *Journal of Aquatic Food Product Technology*, 13(1), pp.69-85.

Rustad, K. (2005). Markedsmuligheter for foredlet laks i Frankrike. *Fiskeriforskning.*

Salmon.fromnorway.com. (2018). *Salmon Academy - Packaging practice and logistics*. [online] Available at: <https://salmon.fromnorway.com/sustainable-aquaculture/packaging-practice-and-logistics/> [Accessed 9 Apr. 2018].

SalmonBusiness. (2018). *Almost half of the French will consume smoked salmon during the holidays*. [online] Available at: <http://salmonbusiness.com/almost-half-of-the-french-will-eat-smoked-salmon-during-the-holidays/> [Accessed 5 Feb. 2018].

Saumon de France. (2018). *Saumon de France: Saumon fumé & saumon frais en ligne*. [online] Available at: <https://www.saumonfrance.fr/> [Accessed 6 Apr. 2018].

Schleper, M., Blome, C. and Wuttke, D. (2015). The Dark Side of Buyer Power: Supplier Exploitation and the Role of Ethical Climates. *Journal of Business Ethics*, 140(1), pp.97-114.

SCI Questionnaire France (2017) Data retrieved from the Norwegian Seafood Council.

Seafood.no. (2018). *Markedsinnsikt*. [online] Available at: <https://si.seafood.no/SASVisualAnalyticsViewer/VisualAnalyticsViewer.jsp?reportName=%20Consumer%20insight%20Salmon%20and%20trout&reportPath=/SI+Felles/10.+VA+Reports/&appSwitcherDisabled=true&reportViewOnly=true> [Accessed 9 Jan. 2018].

Shimp, T. and Sharma, S. (1987). Consumer Ethnocentrism: Construction and Validation of the CETSCALE. *Journal of Marketing Research*, 24(3), p.280.

Shiu, E., Hair, J., Bush, R. and Ortinau, D. (2009). *Marketing research*. New York: McGraw-Hill Higher Education.

SINTEF / Kontali Analyse (2011). *Potensial for økt verdiskaping i lakse- og ørretoppdrettsnæringen*. [online] Available at: <https://www.regjeringen.no/globalassets/upload/fkd/vedlegg/rapporter/2011/sintefrapport_verdiskaping.pdf> [Accessed 24 Jan. 2018].

SINTEF Fiskeri og havbruk AS (2014). *Lønnsom foredling av sjømat i Norge. Med fokus på teknologiutvikling og økt automatisering*. [online] Available at: <https://www.sintef.no/globalassets/upload/fiskeri_og_havbruk/publikasjoner/rapporter/rapport-nfd_v22_rettet-skrivefeil_final-2.pdf> [Accessed 24 Jan. 2018].

SNF / Centre of Fisheries Economics (2002). *Vertical relationships in the value chain: an analysis based on price information for cod and salmon in Europe*. 2001:48.

SjømatNorge (2013) *Environmental report - Norwegian seafood industry*. Available at: <https://sjomatnorge.no/wp-content/uploads/2014/04/Environmental_report_2013_EN.pdf> [Accessed 06. April 2018]

Sæther, K (2009) Høringssvar - Forslag til forskrift om tildeling av løyve til havbruk med laks, ure og regnbogeaure i sjøvatn [online] Available at: <https://www.regjeringen.no/globalassets/upload/fkd/vedlegg/hoeringer/2008/laksekonsesjoner/norske-sjomatbedrifters-landsforening.pdf> Accessed 10.05.2018

Toften, K. (2005). Nisjemarkedsføring som strategi for norsk sjømatnæring. *Økonomisk Fiskeforskning*, 5.

Veale, R., Quester, P. and Karunaratna, A. (2006). 3rd International Wine Business & Marketing Research Conference. In: *3rd International Wine Business & Marketing Research Conference*. [online] Montpellier. Available at: <http://academyofwinebusiness.com/wp-content/uploads/2010/05/Veale.rtf.pdf> [Accessed 19 Apr. 2018].

Versandmagazin 2018. (2018). *Caviar House & Pronier*. [online] Available at: <https://www.yumpu.com/en/document/view/59615074/caviarhouse-prunier-balik-versandmagazin-2018> [Accessed 6 Apr. 2018].

Wilson, A. (2011). *Marketing research: An integrated approach*. Harlow: Financial Times Prentice Hall.

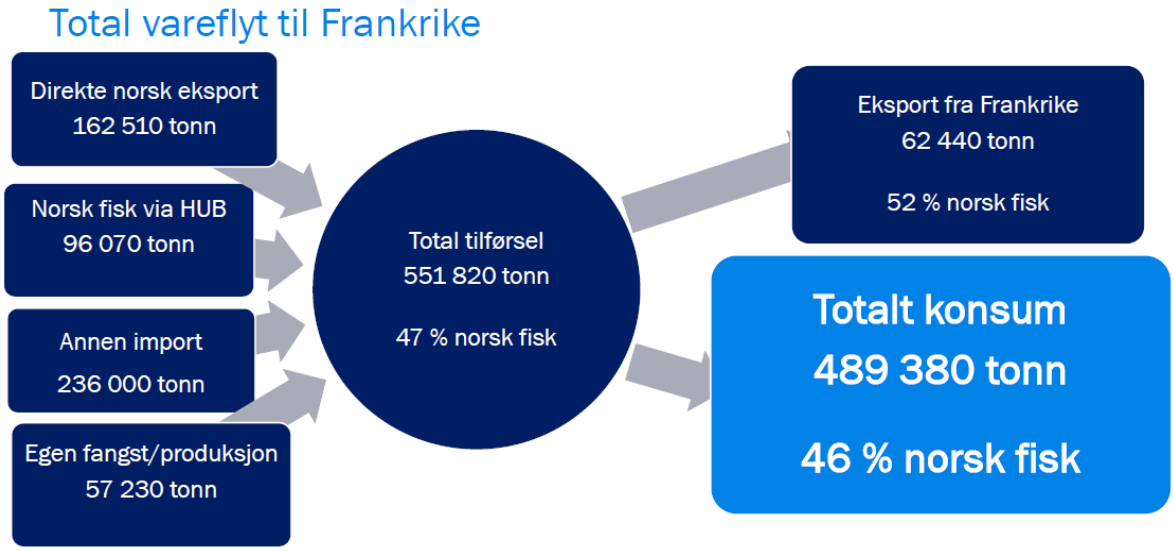
World Bank (2018) *France* [online] Available at: <https://data.worldbank.org/country/France> Accessed: 09.01.2018

Wright, G. and Weber, E. (2017) France. Available at: <http://academic.eb.com/levels/collegiate/article/France/110436> Accessed: 08.01.2018.

Xie, J. and Myrland, Ø. (2011). Consistent Aggregation in Fish Demand: A Study of French Salmon Demand. *Marine Resource Economics*, 26(4), pp.267-280.

10 Appendix

Appendix 1 – Total consumption



Source: Kontali Analyse / Eurofish (2017).

Total konsum og andel med norsk opprinnelse

	Total	Norsk opprinnelse	Andel norsk opprinnelse
Torsk	166 640	47 770	29 %
Laks	188 520	150 760	80 %
Hyse	15 530	3 990	26 %
Reker	5 070	630	12 %
Makrell	34 650	2 910	8 %
Sild	23 590	9 810	42 %
Sei	40 960	8 320	20 %
Ørret	14 420	1 620	11 %
Total	489 380	225 810	46 %

Source: Kontali Analyse / Eurofish (2017).

Appendix 2 - The EU market for smoked salmon in 2013

THE EU MARKET FOR SMOKED SALMON IN 2013 (VOLUME IN TONNES)

Member States	Production	Import	Export	Apparent market
EU 28	163.800	732	8.892	155.639
Germany	14.818	39.111	10.411	43.518
France	28.259	8.696	4.368	32.587
United Kingdom	16.716	2.131	4.724	14.123
Italy	1.149	12.418	107	13.460
Spain	10.184	1.097	559	10.723
Poland	55.067	984	45.469	10.581
Belgium	2.903	6.060	1308	7.655
Denmark	13.368	2.311	9.692	5.987
The Netherlands	(*) 4.620	2.705	3.325	4.000
Finland	1.830	308	37	2.101
Austria	0	2.314	516	1.798
Lithuania	13.122	45	11.469	1.698
Ireland	1.180	547	284	1.443

*Source: STF-ADEPALE, PRODCOM, COMEXT, French processors; *estimates (based on panel data).*

Source: EUMOFA, 2016b

Appendix 3 - Different labeled products of smoked salmon in France

3a) Picture from the M.A.D.E. Exhibition in Paris, France 2018

3b) Picture from the M.A.D.E. Exhibition in Paris, France 2018

3c) Picture from a supermarket in Paris, France 2018

3d) Picture from a supermarket in Paris, France 2018

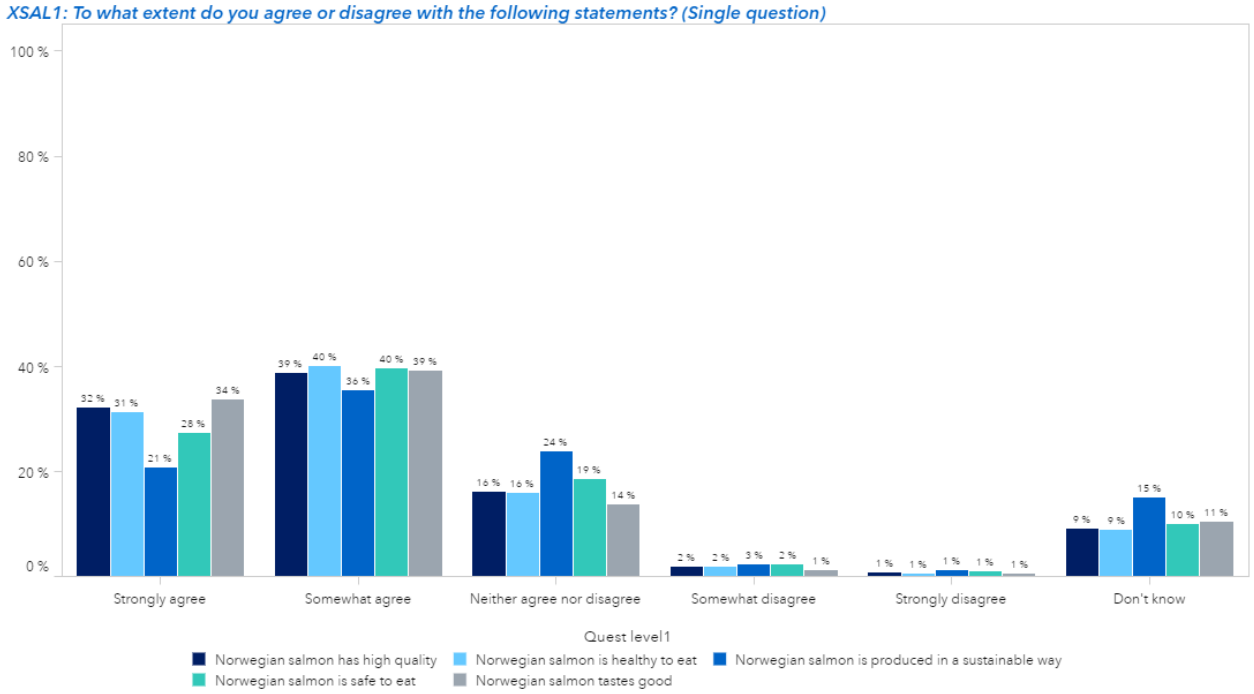
3e) Picture from a supermarket in Paris, France 2018

3f) Picture from a supermarket in Paris, France 2018

Appendix 4 - French consumer data

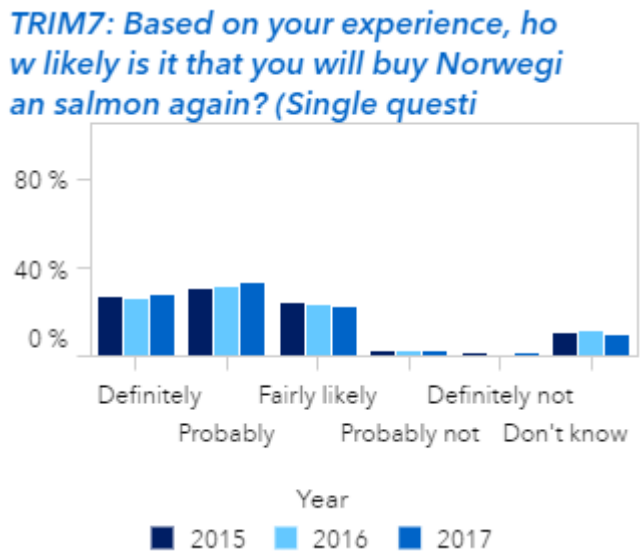
Source: Seafood.no, 2018

4a) French consumer survey



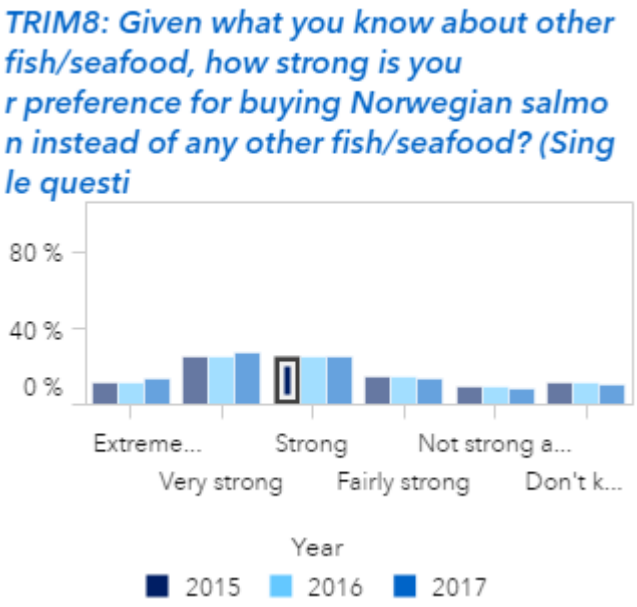
Source: Seafood.no, 2018

4b) French consumer survey



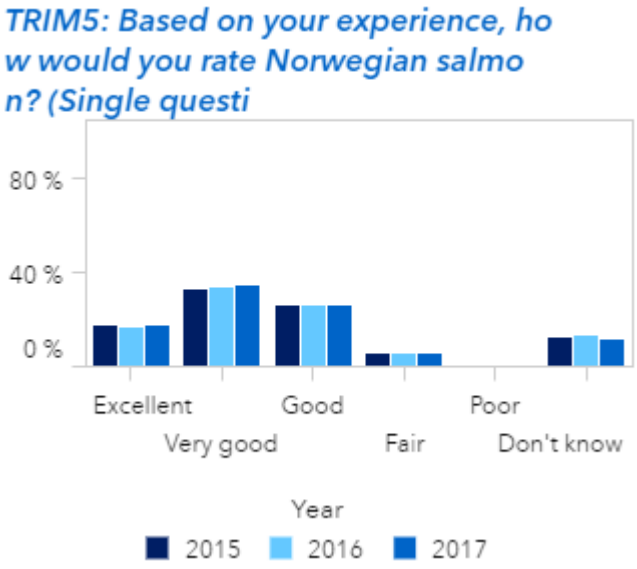
Source: Seafood.no, 2018

4c) French consumer survey



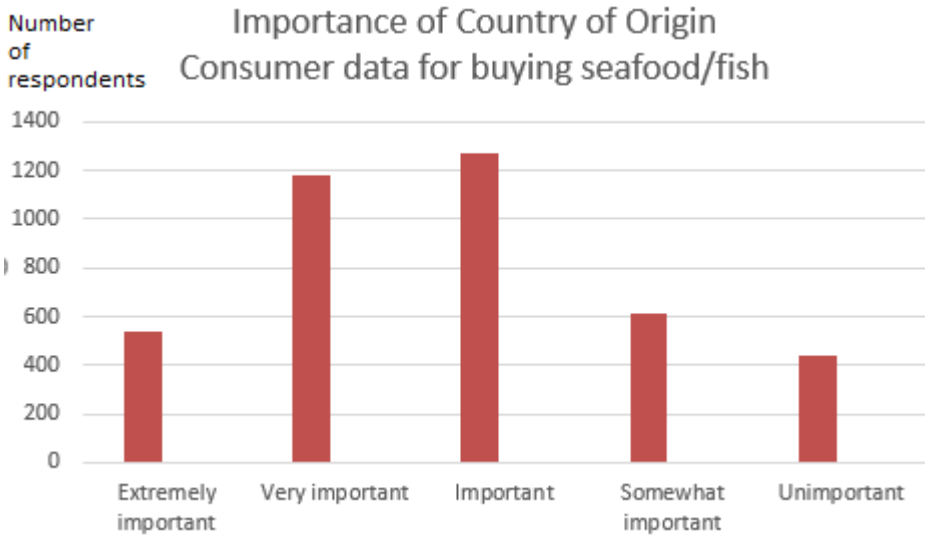
Source: Seafood.no, 2018

4d) French consumer survey



Source: Seafood.no, 2018

4e) Importance of country of origin for French consumers



Source: Seafood.no, 2018

Appendix 5 - Electricity prices, labour costs and processing of salmon

5a) A comparison of electricity prices

	Gj.snitt 2003–2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Norge	26,6	19,2	20,3	21,6	25,1	25,1	29,1	29,4	32,3	33,9	30,6
Handelspartnerne	64,3	51,0	51,5	52,9	61,5	62,9	72,1	75,4	72,2	73,2	72,9
Relative elektrisitetspriser, prosent	41,3	37,6	39,4	40,8	40,8	39,9	40,4	39,0	44,7	46,3	42,0

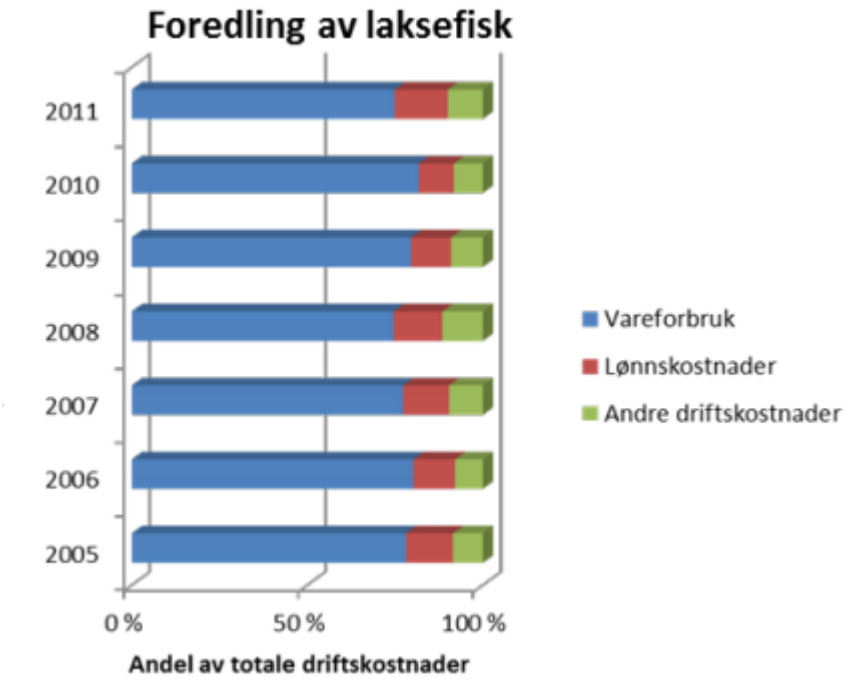
Source: SINTEF Fiskeri og havbruk AS (2014)

5b) A comparison of labour costs

Gjennomsnittlig lønnskostnader pr. arbeidet time	Arbeidet tid	Ikke-arbeidet tid	Arbeidet og ikke-arbeidet	Andre sosiale kostnader	Totalt
kr/t	%	%	%	%	%
Norge	363	65,5	17,4	82,9	17,1	100
Danmark	289	75,8	14,6	90,4	9,6	100
Storbritannia	172	71,4	13,2	84,6	15,4	100
Spania	159	55	19,6	74,6	25,4	100
Polen	49	60,6	25,3	85,9	14,1	100

Source: SINTEF Fiskeri og havbruk AS (2014)

5c) Processing of salmon



Source: SINTEF Fiskeri og havbruk AS (2014)

Appendix 6 - Conversion rates

6a) Weight conversion ratios for Atlantic salmon.

	Atlantic salmon
Live fish	100%
Loss of blood/starving	7%
Harvest weight / Round bled fish (WFE)	93%
Offal	9%
Gutted fish, approx. (GWE)	84%
Head, approx.	7%
Head off, gutted	77%
Fillet (skin on)	56 - 64 %
C-trim (skin on)	60%
Fillet (skin off)	47 - 56 %

Net weight: Weight of a product at any stage (GWE, fillet, portions). Only the weight of the fish part of the product (excluding ice or packaging), but including other ingredients in VAP.

Primary processing: Gutted Weight Equivalent (GWE) / Head on Gutted (HOG)

Secondary processing: Any value added processing beyond GWE

Biomass: The total weight of live fish, where number of fish is by an average weight

Ensilage: Salmon waste from processing with added acid

BFCR: IB feed stock + feed purchase - UB feed stock kg produced - weight on smolt release

Source: Marine Harvest, 2017

Appendix 7 - List of interviewees

Number	Companies in Norway	Position	Gender	Type of interview
1.	Processor and exporter	CEO	Male	Individual
2.	Exporter	Sales executive	Male	Individual
3.	Exporter	Sales executive	Male	Individual
4.	Processor and exporter	CEO	Male	Individual
5.	Processor and exporter	CEO	Male	Individual

Number	Companies in France	Position	Gender	Type of interview
1.	Processor and exporter	Sales executive	Male	Individual
2.	Processor and exporter	Sales executive	Male	Individual
3.	Industry union	CEO	Male	Individual
4.	Online retailer	Sales executive	Male	Individual
5.	Importer	Sales executive	Male	Individual

Appendix 8 - Interview guide

Interview questions
Questions about export / import to France
1. What are your current largest markets for salmon? What is the difference between these markets and the French market?
2. When and why did you start importing / exporting to France?
3. Which fish types and seafood products do you import/export to the France? Why?
Demand / Price
4. Which factors influence demand for smoked salmon? Health, trends?
5. What are the challenges regarding smoked salmon in France? Environment issues? Scandals?
6. Does price have a great impact on demand for the product? The price has been fluctuating very much the last few years. How does this affect the market, and how do you handle the price variations with customers?
7. Does exchange rate fluctuations influence your import/export quantity?
8. Has the country's economic growth had an impact on demand in the national market?
9. Do you believe that population growth has an influence on demand?
Consumers (French interviews only)
10. ETHNOCENTRISM: Do you believe a French consumer would prefer salmon smoked in France, rather than another country?

11. According to our data, younger consumers are eating more seafood, including smoked salmon. Why do you think this is? Do you believe this trend will continue?
12. Health benefits and good taste are listed as the main reasons for choosing seafood. Can you think of any other important factors?
13. Do you believe smoked salmon is an important part of French food culture? E.g., is smoked salmon a 'must have' during holidays, Christmas and so on?
Competition and country of origin
14. Who are your greatest competitors? Either countries or companies
15. In relation to other imported fish types, local catches and other products such as chicken – What do you think is the main substitute to smoked salmon?
16. Has Country of Origin an impact on what product the consumers decide to buy?
17. How do you see future potential?
18. How can Norway be more competitive as a processor in a European market, e.g. France?
19. Today, Norway has tariffs of 13% on smoked salmon. However, they have a tariff-free quota that historically has been reached by the end of the year. If Norway did not have any tariffs, but a free trade agreement on processed fish - do you think Norway would be more competitive and sell more to the EU?
Supply chain
19. Do you sell your products directly to the importers or do you use agents? What are the typical outlets?
20. Is there a skewed power relationship between buyer and supplier?
21. Is the imported fish treated in any way in France? Is the product sold whole / cut in smaller pieces / new packaging?

B2B
22. Do you buy / sell on contracts or spot price?
23. Do you export/import frozen or fresh?
24. According to Norwegian sources, the campaigns in French retail markets have begun to increase again. How long in advance are these campaigns planned? In relation to price fluctuations etc.
25. What is your opinion on labelling? Label Rouge, ecological labelling (ASC, Debio, and more), country of origin labelling (‘SEAFOOD FROM NORWAY’)
26. Do you export directly or through hubs? E.g., Denmark, Poland

Appendix 9 – Dataset

			Volume in KG	Value in EUR/KG	Price in EUR/KG	
Year	Import volume	Import value	Domestic production volume	Domestic production value	Total volume	Total value
1995	2464	28601	19318,218	271651,009	21782,218	300252,009
1996	1689	20467	19748,348	262869,327	21437,348	283336,327
1997	2455	22929	20195,734	281642,536	22650,734	304571,536
1998	2560	28381	16529,075	240965,028	19089,075	269346,028
1999	2250	24854	19230,354	288642,282	21480,354	313496,282
2000	2488	29097	18967,48	317837,539	21455,48	346934,539
2001	2453	28906	19206,661	318923,672	21659,661	347829,672
2002	2443	25620	22076,765	359672,601	24519,765	385292,601
2003	2710	24660	23938,93	383353,976	26648,93	408013,976
2004	2701	24855	22579,612	365170,919	25280,612	390025,919
2005	3277	31541	26343,135	411898,501	29620,135	443439,501
2006	4328	40531	28306,795	484162,71	32634,795	524693,71
2007	3639	34977	37813,257	644246,612	41452,257	679223,612
2008	4404	39569	30617,533	535223,871	35021,533	574792,871
2009	5286	46419	32598,406	514184,095	37884,406	560603,095
2010	7045	71716	0	0	7045	71716
2011	7120	76131	32535,79	607232,994	39655,79	683363,994
2012	8420	75309	32459,316	578858,273	40879,316	654167,273
2013	8055	84411	42108,31	869323,894	50163,31	953734,894
2014	6930	78316	27251,828	584500,174	34181,828	662816,174
2015	7530	80858	23024,935	524477,783	30554,935	605335,783
2016	6964	81796	24125,591	569255,621	31089,591	651051,621

Year	CPI France	CPI in percentage	Weighted price import	Weighted price domestic production	Total weighted price	Total real price
1995	79,47386163	0,794738616	11,6075487	14,06190825	13,7842716	10,95489294
1996	81,0671363	0,810671363	12,1178212	13,31095274	13,21694862	10,71460175
1997	82,05777341	0,820577734	9,339714868	13,94564496	13,44643118	11,03384203
1998	82,54621253	0,825462125	11,08632813	14,57825244	14,10995703	11,64723512
1999	82,98649569	0,829864957	11,04622222	15,00972275	14,59455845	12,11151262
2000	84,39677768	0,843967777	11,69493569	16,75697241	16,16997331	13,64693643
2001	85,77266254	0,857726625	11,78393804	16,60484725	16,05886962	13,77412005
2002	87,41684496	0,87416845	10,48710602	16,29190694	15,71355194	13,73629134
2003	89,26053068	0,892605307	9,099630996	16,01383086	15,31070763	13,66641889
2004	91,16613122	0,911661312	9,202147353	16,17259495	15,42786698	14,06498945
2005	92,74839881	0,927483988	9,624961855	15,63589531	14,97088048	13,88525194
2006	94,31002814	0,943100281	9,364833641	17,10411617	16,07773881	15,16291999
2007	95,7134307	0,957134307	9,611706513	17,03758584	16,38568467	15,68330094
2008	98,40672533	0,984067253	8,984786558	17,48096004	16,41255598	16,15105889
2009	98,49340607	0,984934061	8,781498297	15,7732895	14,79772693	14,57478528
2010	100	1	10,17970192	0	10,17970192	10,17970192
2011	102,1174868	1,021174868	10,69255618	18,66353926	17,23238886	17,59728242
2012	104,1145837	1,041145837	8,944061758	17,83334784	16,00240261	16,66083486
2013	105,0137245	1,050137245	10,47932961	20,64494856	19,01259893	19,96583826
2014	105,5468798	1,055468798	11,3010101	21,44810888	19,39089314	20,46648267
2015	105,5867805	1,055867805	10,73811421	22,7786868	19,81139161	20,91821058
2016	105,7803579	1,057803579	11,74554854	23,59550989	20,94114461	22,15161772

Year	GDP per capita	Real GDP per capita	Substitute volume	Substitute value	Substitute weighted price	Substitute real price
1995	25781,5425	20489,58741	3 415	5 824	1,70529655	1,355265021
1996	26047,0001	21115,55707	6 001	9 929	1,654641179	1,34137022
1997	26561,6769	21795,92064	6 676	11 710	1,754141305	1,439409298
1998	27405,0628	22621,84138	4 015	9 103	2,267524692	1,871755751
1999	28193,3641	23396,68488	4 659	18 305	3,9288528	3,260417259
2000	29086,0004	24547,64709	5 127	14 782	2,883236972	2,433359097
2001	29439,4338	25250,98621	4 043	13 966	3,454093982	2,962668375
2002	29552,9991	25834,2994	4 953	17 572	3,547614981	3,101213088
2003	29584,7598	26407,5136	6 141	20 792	3,385612266	3,022015475
2004	30186,0325	27519,438	5 678	20 246	3,565847026	3,250844779
2005	30441,006	28233,54565	5 772	20 917	3,62421736	3,361403571
2006	30947,442	29186,54126	4 675	19 804	4,236649709	3,995585533
2007	31482,877	30133,34166	2 609	12 053	4,620451725	4,422392859
2008	31368,5646	30868,77721	2 333	9 479	4,063209616	3,998471526
2009	30289,6699	29833,32757	3 035	9 253	3,048447518	3,002519793
2010	30732,8559	30732,8559	3 679	12 812	3,481981436	3,481981436
2011	31220,4984	31881,58833	3 239	11 964	3,694305618	3,772532052
2012	31126,524	32407,25088	2 757	9 466	3,43359758	3,574875827
2013	31145,1885	32706,72245	5 047	12 105	2,398743309	2,519009689
2014	31282,2966	33017,48799	5 636	13 821	2,452185779	2,588205576
2015	31477,6036	33236,18822	4 045	12 186	3,012838831	3,181159523
2016	31723,7711	33557,51861	3 973	13 326	3,35408896	3,547967306

Appendix 10 – Regression analyses

Autoregressive (AR):

Appendix 10a)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSTANT	-9.766081	6.022538	-1.621589	0.1244
LNREALPRICEIMPORT	-0.575412	0.524271	-1.097547	0.2886
LNREALGDPPERCAP	2.112324	0.716922	2.946379	0.0095
DUMMY2010	-1.922702	0.409091	-4.699935	0.0002
AR(1)	0.372370	0.274510	1.356488	0.1938
SIGMASQ	0.014096	0.005994	2.351555	0.0318

R-squared	0.909417	Mean dependent var	10.20591
Adjusted R-squared	0.881110	S.D. dependent var	0.403764
S.E. of regression	0.139219	Akaike info criterion	-0.871747
Sum squared resid	0.310112	Schwarz criterion	-0.574190
Log likelihood	15.58922	Hannan-Quinn criter.	-0.801652
Durbin-Watson stat	1.989756		

Inverted AR Roots	.37

Appendix 10b)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSTANT	-16.60895	6.105017	-2.720541	0.0166
LNREALPRICEIMPORT	-1.655998	0.788620	-2.099868	0.0543
LNREALGDPPERCAP	3.001978	0.767175	3.913032	0.0016
LNREALSUBSALMONFILLET	0.382934	0.271903	1.408346	0.1808
DUMMY2010	-2.436854	0.430142	-5.665236	0.0001
DUMMY2013	0.373704	0.339291	1.101425	0.2893
AR(1)	0.252587	0.288692	0.874935	0.3964
SIGMASQ	0.006848	0.002659	2.575479	0.0220

R-squared	0.955991	Mean dependent var	10.20591
Adjusted R-squared	0.933986	S.D. dependent var	0.403764
S.E. of regression	0.103740	Akaike info criterion	-1.415582
Sum squared resid	0.150667	Schwarz criterion	-1.018840
Log likelihood	23.57141	Hannan-Quinn criter.	-1.322122
Durbin-Watson stat	1.851298		

Inverted AR Roots	.25

Moving average (MA):

Appendix 10c)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSTANT	-11.72666	5.687748	-2.061741	0.0559
LNREALPRICEIMPORT	-0.706328	0.520834	-1.356150	0.1939
LNREALGDPPERCAP	2.338594	0.686699	3.405559	0.0036
DUMMY2010	-1.981509	0.489715	-4.046249	0.0009
MA(1)	0.250082	0.288349	0.867289	0.3986
SIGMASQ	0.014567	0.006643	2.192702	0.0435

R-squared	0.906393	Mean dependent var	10.20591
Adjusted R-squared	0.877140	S.D. dependent var	0.403764
S.E. of regression	0.141525	Akaike info criterion	-0.842748
Sum squared resid	0.320468	Schwarz criterion	-0.545191
Log likelihood	15.27023	Hannan-Quinn criter.	-0.772652
Durbin-Watson stat	1.797019		

Inverted MA Roots	-.25

Appendix 10b)

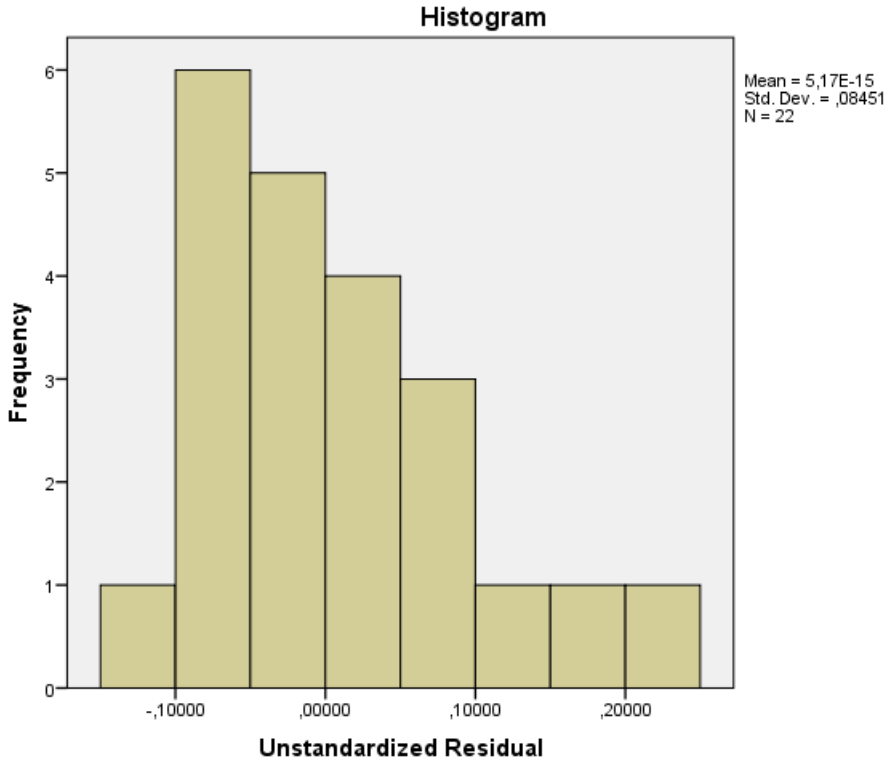
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSTANT	-17.47842	5.632497	-3.103138	0.0078
LNREALPRICEIMPORT	-1.766202	0.737855	-2.393699	0.0312
LNREALGDPPERCAP	3.109481	0.709184	4.384593	0.0006
LNREALSUBSALMONFILLET	0.423058	0.260941	1.621277	0.1273
DUMMY2013	0.378764	0.272608	1.389411	0.1864
DUMMY2010	-2.498915	0.401018	-6.231432	0.0000
MA(1)	0.255334	0.284283	0.898167	0.3843
SIGMASQ	0.006799	0.002617	2.597750	0.0211

R-squared	0.956311	Mean dependent var	10.20591
Adjusted R-squared	0.934467	S.D. dependent var	0.403764
S.E. of regression	0.103361	Akaike info criterion	-1.422819
Sum squared resid	0.149570	Schwarz criterion	-1.026076
Log likelihood	23.65101	Hannan-Quinn criter.	-1.329359
Durbin-Watson stat	1.898474		

Inverted MA Roots	-.26

Appendix 11 – Histogram and boxplot

Appendix 11a) Histogram



Appendix 11b) Boxplot