



UNIVERSIDADE DA CORUÑA

Faculty of Economics and Business

Thesis Degree

Forecast demand of fishery markets and development of high added-value products.

Literature review and empirical evidence.

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**Degree in Management and Business Administration**  
Year 2017

Thesis degree presented in the Faculty of Economics and Business in the University of A Coruña in order to obtain the degree in Management and Business Administration

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# Resumen

Los objetivos de este trabajo han sido dos. En primer lugar se ha estimado el mercado potencial de la alimentación de los productos de pesca en el hogar en España, analizando, simultáneamente, la influencia que la crisis económica ha tenido sobre el comportamiento de los hogares. En segundo lugar, se ha investigado la oportunidad de desarrollar productos de pesca de mayor valor añadido, concretando el caso de la angula. Para realizar este análisis, se han utilizado los datos de consumo del panel de hogares del Ministerio de Agricultura, Pesca y Alimentación tanto en cantidad (Kgs. y Kgs per cápita) como en valor (€ y € per cápita) así como datos de la empresa Angulas Aguinaga (Kgs). Se han utilizado las series históricas para analizar la evolución de los datos y el test de Chow para analizar el cambio estructural de la serie histórica.

El análisis de datos realizado ha permitido comprobar que el mercado potencial de consumo de alimentación en el hogar ha incrementado de manera continua hasta el año 2008. A partir de ese año se identifican tres resultados sobresalientes. En primer lugar, en términos agregados –serie sin deflactar- se produce un crecimiento a una tasa muy moderada si bien al analizar los criterios de consumo per cápita, se observa un cambio de comportamiento de compra por parte de los hogares que residen en España puesto que disminuye de manera notable el consumo per cápita tanto en cantidad (kgs. per capita) como en valor (€ per cápita). Este comportamiento se replica para la demanda de productos de pesca. En tercer lugar, la categoría de productos de pesca que presenta una mayor tasa de crecimiento es la categoría de las conservas donde se puede observar que los hogares están dispuestos a pagar más por estos productos. Este dato revela que el consumidor está dispuesto a pagar más por productos de mayor valor añadido. Este mismo resultado ha sido identificado al analizar el mercado de la angula. La empresa Angulas Aguinaga ha podido recuperar el mercado de la gula que estaba casi agotado gracias al desarrollo de un nuevo producto que consiste en un sucedáneo de pescado de alta calidad sensorial y del ahorro de tiempo que supone su fácil preparación.

Palabras clave: Mercado potencial, Series de tiempo, Productos de pesca, Valor añadido.

# Abstract

This final degree project has had two main objectives. Firstly, the study of a market potential estimation of the different fish product categories in terms of Spanish home consumption. At the same time, the influence and impact of the economic crisis has been analysed, focusing in terms of home consumption behaviour. Secondly, the opportunity of developing high added value products has been investigated, analysing baby eels as a particular case. All home consumption and expenditure information was obtained from the Ministries of Environment, Agriculture, Fisheries and Food. These data is represented in quantity (millions of Kg. and Kg. per capita) and value (millions of € and € per capita). The tools chosen in order to analyse these evolution have been historical series, meanwhile the Chow test was applied to study the structural change of these historical series.

These data analysis allows to verify how the market potential of food households has been continuously increasing until the year 2008. From that year on three outstanding results had been concluded. Firstly, at an aggregated level –historical series without deflation- the increment in per capita consumption has been at a very moderated rate. Secondly, in Spain home purchasing habits had change with a relevant decrease in per capita consumption of both quantity (Kg. per capita) and value (€ per capita). This behaviour is deeply studied in fish products. Thirdly, from the chosen categories, the one that presents higher growth rates are canned fish products, which means that consumers tend to pay more in terms of value for these products. This data reveals that consumers are actually willing to pay more for higher value-added products. The same conclusion is verified when analysing the case study chosen; the baby eels market. Furthermore, the Spanish company Angulas Aguinaga was able to recover from the elver market, which was almost exhausted due to the overexploitation of the product, with the development of an innovative product; young eels. This innovative product is a fish substitute of high sensorial quality and it is easy to prepare, reducing time costs. These added value attributes are analysed when studying the development of high added products.

Key words: Market Potential, Time Series, Fishing Products, Added Value.

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# Introduction

The economic crisis has had negative effects on the different areas of the economy, even in those sectors of inelastic demand such as food products. For this reason, it is important to analyse the impact of the economic crisis on these food products, focusing on fishery markets due to its relevance in Spain. The theory of value presupposes that developing higher added value products for the consumer is able to generate market growth rates, either in quantity (kg. or kg. per capita) or value (€ or € per capita).

Following that theory this final degree project has had two objectives. Firstly, a market potential estimation of Spanish home fish products has been made, while at the same time how the crisis affected home consumption behavior has been analysed. Secondly, the opportunity of developing higher added value products has been investigated, focusing on different fish products categories and the particular case of the elver. The information to achieve these objectives had been collected from the Ministry of Agriculture, Fisheries, Food and Environment (MAPAMA, 2000-2016). All data is presented in terms of quantity (Kg. and Kg. per capita) and value (€ and € per capita). Time series is the technique chosen to be able to analyze all data evolution, meanwhile, the structural change of the time series has been studied through the Test of Chow.

In order to achieve these objectives, the project has been structured in three parts. As a result, the first chapter gathers all theoretical fundamentals that are needed for the study. It examines the specific components of consumer preferences, as well as the importance of perceived quality in terms of benefits and costs. Knowing consumers' decisive factors of the product as well as the variables that influence directly agro-food consumption is key when developing new products. This is because consumer satisfaction is reflected in terms of consumption. The methods needed when calculating the potential market demand are also explained, in which, in particular, the most interesting technique to perform this analysis are time series.

In the second chapter, all knowledge exposed from the first chapter is applied on a practical way. To do so, a study supported by historical series of the Spanish agro-food market is carried out, studying a scenario of economic growth followed by a phase of recession after the crisis of 2008.

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The third chapter analyses a real case study of a fish product, the elver, whose demand fell progressively until it almost disappeared. This market was revitalized due to the innovation and development of a new product. In this case, it was a fish substitute imitating the elver; “La Gula del Norte”, created by the Spanish company Angulas Aguinaga. Consequently, it is proved how a declining market –in this case the elver–, can improve with a current valorisation of resources and innovation, resulting into a successful business product.

# 1. Theoretical Foundations

## 1.1 Reaching added value through preferences and quality

Every business' objective is based on bringing added value to its clients providing a better product or service than its competitors. Today's consumers are characterized for having exclusive expectations due to the high availability of information they have (Giraud, 2005). As a result, competing in the global world with its continuous expansions from brand requires being able to look for marketing strategies that increase its competitive edge while matching consumers' preferences (Armstrong, Cunningham and Kotler, 2002). The company needs to be flexible enough to adapt to changes with marketing activities that will generate value to its clients (Day, 1990, Peter and Olson, 1990 and Seth and Newman, 1991). There are several approaches that have been established to reach value that focuses on analysing consumer's demand. Analysing the intention of buying is an important tool to reach added value, however there are other tools that bring value to its consumers; quality and consumers' preferences (Wierenga, 1983 and Kotler 2012). These tools generate added value creating satisfaction to consumers, affecting positively in their consumption or intention of buying. Business requires a further knowledge and deep understanding of consumer's preferences to actually reach the sales objectives of the company, since quality itself must be adapted with marketing activities to increase sales as it will be explained in the following section (Darwar and Parker, 1994, Dick, Jain and Richardson, 1994, and Lay, 1995).

## 1.2 The relation of quality with value and buying intentions.

Adding quality to products is especially important in agro-food products since it affects consumers' health. However, although fish can be a high quality product, some consumers might not buy it due to the bones it might have. This shows the existence of different value sources that affects consumers' purchases; their perceived benefits and costs. According to Kotler (2012), perceived value is defined as a trade-off or comparison between benefits and costs. Rational consumers will always look to achieve the highest

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benefit/cost ratio or lowest cost/benefit ratio, being this the most favourable offer. These perceived benefits are the following (Grunert, Larsen, Madsen & Baadsgaard, 1996):

**a) Sensory quality:**

Involves benefits associated with product quality. This dimension differentiates the purchasing moment, with physical appearance and texture, and the buying moment with taste and smell among others (Brunso et al. 2002 and Grunert 2005).

**b) Nutritional quality**

Growing importance category associated with health and nutritional quality. These perceived benefits are the ones associated with ingredients, nutrients, kcal and the energy of the product.

**c) Hygienic-sanitary quality**

It is defined by the security of the product, being acceptable for consumption without any pathogenic agents. This is especially important in sea products (Grunert, 2005).

**d) Image benefits**

Positive or negative associations created by intangible assets such as brand image, corporate image or quality guarantees. Positive associations tend to have higher perceived quality.

**e) Added Services**

Services that add products' value, such as home delivery, previous counsel, consumers' service, etc.

**f) Other Benefits**

Those quality benefits that are not directly related with the product. These include emotions and experiences consumers' have with the brand or product.

Perceived costs are divided in two groups;

**a) Monetary costs:**

It is the economic cost of the product, in which the perceived price is often associated with quality. Lower prices increase the perceived value, and vice versa. Agro-food tend to be cheaper than sea food, having a positive effect in consumers.

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**b) Non-monetary costs are divided in three groups:**

**B1) Temporary costs.** It is the time spent in buying, preparation and consumption of the product. This is an increasing concern in today's societies since people tend to spend less time preparing food (Pilgrim, 1957).

**B2) Psychological costs.** Consumers' mental efforts cost like fish bones, smell or physical appearance. Quite relevant in the agro-food industry.

**B3) Physical costs:**

Consumers' physical effort when obtaining the product. This includes the shopping facilities, access, commodity, etc.

## 1.3 Preferences

### 1.3.1 Concept and decisive factors

As it was mentioned before, quality is not the only variable affecting the buying process. Analysing consumers' preferences is an excellent way to evaluate products. Authors have realised the importance of matching design products with preferences (Chocarro, Cortiñas and Elorz, 2007, Verbeke and Ward, 2006, Brunso and Grunert, 2002), identifying specific factors that have a direct effect on agro-food products. Olson and Jacoby (1972) distinguished between intrinsic and extrinsic attributes, in which both have a direct effect on preferences. Intrinsic attributes constitute the physical make-up of the product; appearance, taste, smell and texture. It also includes ingredients, properties, elaboration and the transformation of the product. However, extrinsic factors can be judged prior to consumption, such as the brand and image of the product (Brunso and Grunert, 2002 and Olson, 1977). Personal factors are those related with the consumers' lifestyle, attitudes and expectations. Socio-demographic ones are based on sex, age and habitat among others. Cultural factors such as beliefs, rules and traditions are also important. Environmental conditions such as seasonality, climate and soil also have effects on preferences.

### 1.3.2 Preferences in agro-food products: Components and relationship with quality.

Wierenga (1982) and Steenkamp (1987) defined three main dimensions for agro-food markets; sensory, instrumental/functional and symbolic. These attributes were supported by several authors (Grunet et al., 1995 and Holbrook and Hirschman, 1982), having relevant impact in the consumers' intention process as well as the decisive factors.

#### **a) Sensory properties and preferences**

Sensory preferences are the organoleptic quality dimension of food products, such as smell, taste, texture, colour and appearance. These are related with sensory quality, determining the main acceptance of the product (Giraud, 2005, Steenkamp, 1987).

#### **b) Convenience and preferences**

Convenience is based on doing something in a reduced effort or time. Cohen (1995) distinguishes two efforts; saving physical time/energy based or reductions in the production chain (preparation, consumption, cleaning up). This is a quality added service that brings value (Gofton, 1995).

#### **c) Health and preferences**

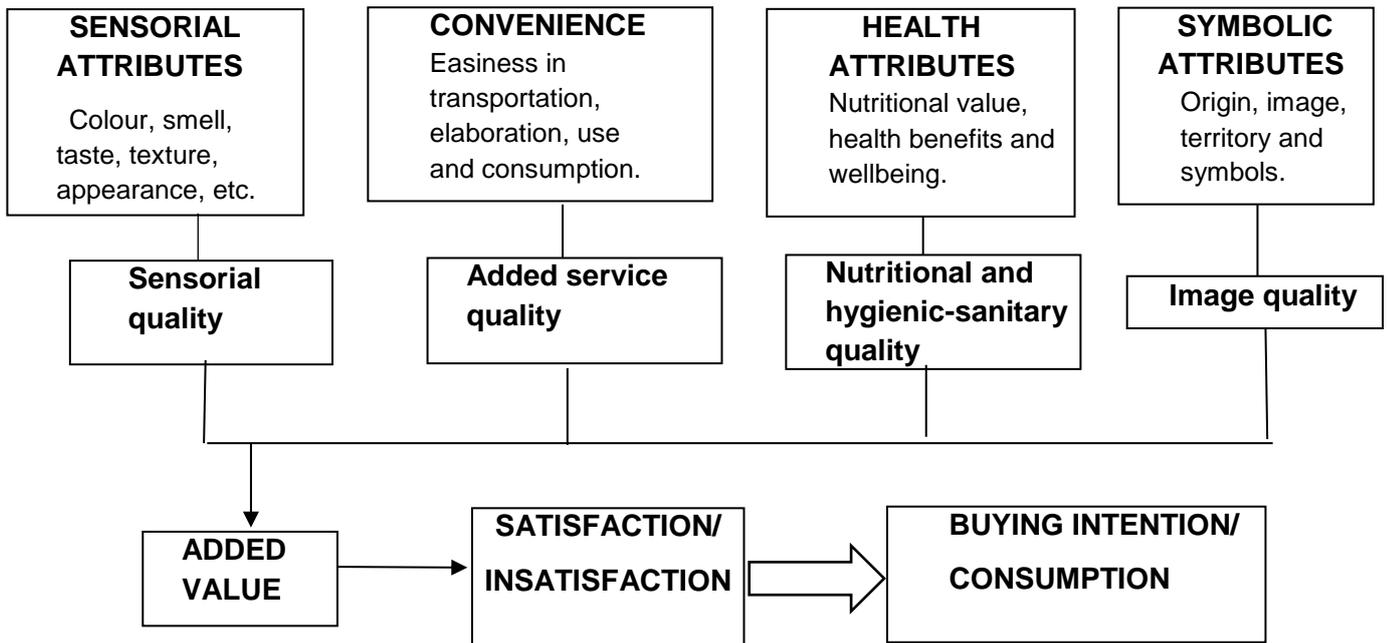
Health preferences are based on nutritional values, additives, ingredients, dietary foods, etc. In agro-food products, coping health preferences with convenience is decisive when increasing sales. Health is associated with nutritional and hygienic-sanitary quality, so adding convenience will result on a quality added service (Brunso and Grunert, 2002).

#### **d) Symbolic attributes and preferences**

Intangible assets that represent past, present and future firms' global performance (Deephouse, 2000). Essential to gain competitive advance and public opinion. These are associated with image perceived benefits.

According to Wierenga (1983), these dimensions form together consumers' global preferences for products. Improving these attributes, as well as the decisive one previously mentioned, will generate added value to the consumers. Added value generates satisfaction benefiting the buying intention process and consumption. The following table represents this process.

**Figure 1.1. Preference's Dimensions. Relationship with satisfaction and buying intentions.**



### 1.3.3 Preferences and Marketing variables

Once marketers have reached information of their consumers' buying intention preferences and quality, they need to adapt these preferences through the following marketing variables;

- a) **Products:** are identified through brand, packaging and labelling. These are informative and differentiator instruments explaining components and the use of the product (Kotler, 2012).
- b) **Price:** is the economic sacrifice the consumer is willing to do in order to receive the product (Ritson and Petrovici, 2001). Agro-food products tend to have differentiation strategies, in which quality and brand have more importance than price (Smith and Natesan, 1999).
- c) **Distribution channels:** formed by intermediaries who take the product from their fabrication point to final consumers (Kotler, 2012). Marketers can use selective distributions, focusing on sale points to situate the product, or intensive distributions with higher amount of sale points.

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- d) Push and pull strategies: used concerning sales increment. While push strategies are realized by the different agents of the distribution channel, pull strategies try to bring the consumer to the sales point by doing promotions in the price among other strategies.
- e) Communication: in order to create a bond between firm and consumers marketers need to use communication variables through different channels; newspapers, ads, blogs, focus groups, etc.

## 1.4. Demand: Concept and forecast calculation

### 1.4.1 Demand Concept

The demand variable offers companies the possibility to measure the firm in the market with relation to its competitors. Deep demand knowledge and marketing surroundings lead to the identification of profitable marketing opportunities by calculating forecast demand in size, growth and earnings (Stevenson and Hojati, 2007). Quantitatively, demand is measured by the level of acceptance in quantity and value. Qualitatively, it is measured through preferences components, highlighting historical series.

### 1.4.2 Forecast demand calculation

The intention of buying is the preference towards a product or brand among its competitors. This calculus reflects consumers' behaviour and purchases, determining the level of acceptance in quantity (Kgs.) and the value it has to its consumers. This forecast demand is calculated with four different concepts; market demand, company's demand, potential market and calculating different areas of potential markets.

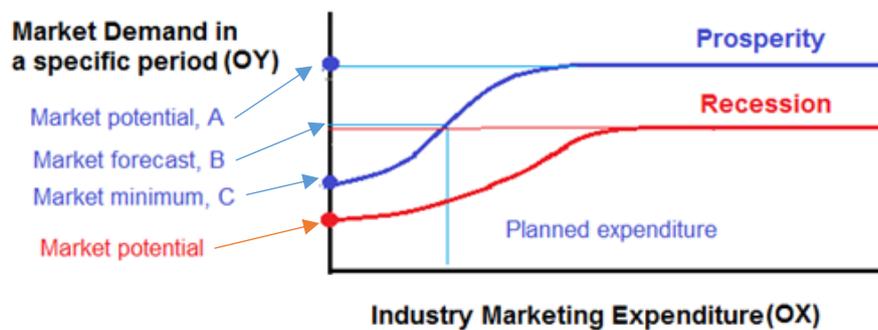
The market demand of a product is the total susceptible volume being acquired for a group of consumers in a specific area, marketing programme and environment (Keller and Kotler, 2012). This is represented in the graph below with two opposite economic scenarios; prosperity (in blue) and recession (red), in which the concepts shown are from the prosperity situation. The function demonstrates that increments in marketing

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expenses create consumers' awareness of the product, increasing demand. The highest value the demand can reach is the market potential (A), meanwhile, the market minimum (C) is the minimum demand products have without the use of marketing. The difference between these terms is the total sensibility of demand. A highest sensibility is due in prosperity economic situations, in which marketing expenses will efficiently cause increments in the demand. Efficient marketing expenses in this cases will increase the demand. However, in recession periods increments in marketing expenses do not tend to affect the demand (Kotler, 2012 and Keller and Kotler, 2012).

**Figure 1.2. Market demand functions**

**Marketing Demand as a function of industry marketing expenditure. Two different environments assumed.**



(Source: Personal elaboration from Kotler and Keller, 2012)

Firm demand englobes the market demand part that is due to the firm's strategies in a period of time, with different marketing expenses level (Keller and Kotler, 2012). These marketing strategies' variables are based on preferences and perceptions of products, prices and messages compared with competitors. Firms' sales forecasts are the ones that shows marketing strategies efficiency, depending on the firms' objective and marketing expenses. Sales objectives are determined once directors know their sales previsions and the firm demand, which tend to be higher than the actual predicted one to increase efforts (Frank and Glass, 1991 and Shafer and Sonnenschein, 1982). The firms' potential sales is the limit of sales the company can reach when having the highest demand, but it will depend on the competence. Firms' potential sales demand will be equal to market potential demand if the firm has the total market share, however this is hardly ever the case, in which the usual is that they are blow the total market potential demand (Kotler, 2012, Kotler and Armstrong 2003).

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Once there are established all key aspects that form the demand, it is important to know how to actually calculate the real market demand in a practical way. As a result, potential market as well as market potential areas need to be studied. Kotler and Keller (2012) defined potential market as the maximum sales value available for all firms of an specific market and conditions, with a concrete amount of marketing expenses over a period of time.

There are two main ways to calculate potential markets, showed in the table below. The first formula shows the common variables used to calculate potential markets. However, McMeeking et al. (2002) and Leland (1986) pointed out the difficulty of calculating the number of buyers. The proportion chain method is a similar alternative, based on multiplying population for several percentages that allows to have a more realist consumer number or the total demand potential (Kotler, 2012).

Potential demand = number potential buyers * Average acquisitions per buyer * price
Proportion chain method = Population * % (personal income, personal expenses, etc.)

Potential market by areas is very useful to organised marketing expenses in all territories, maximizing sales and demand (Dunn, 1956). The following graph explains in order from top to bottom the different steps marketer directors realize to calculate the potential market by areas, differentiating two different models; by the construction of the market or the multifunctional index model. It is relevant to mention that besides these models, directors have to know the total sales' volume of the market by analysing competitors as well.

### 1.4.3 Forecast demand methods

Kotler and Keller (2012) established the most important methods to be able to calculate the future demand, which can be gathered in the buying intention, an expert diagnosis and historical series. In this paper we will focus mostly on the last one since it provides a much more globalised view in time concepts.

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a) Buying Intention

As it was explained before, is the preference towards a product or brand among its competitors. This calculus reflects consumers' behaviour and purchases, determining the level of acceptance in quantity (Kgs.) and the value it has to its consumers. It is more efficient in negative terms since positive results can show the interest of a product on a consumer without the need of buying it. However, if the buying intention is negative consumers will not be interested in the product and therefore, it will not be accepted in the market (Fandos and Flavian, 2016).

b) Expert Diagnosis

Based on acquiring information from suppliers, intermediaries, distributors, marketing consultants and trade associations, which can be useful specially when having problems on consumers' surveys. However, subjectivity problems tend to lead this method to failure, sometimes corrected with group discussion or debates activities.

c) Historical Series

These are temporal quantitative breakdown prevision methods. In the breakdown, variables (in this case, sales) are differentiated in four components; trend, cycle, seasonality and error, forecasting its evolution. The trend component reflects long-term variations, meanwhile seasonality movements tend to periodically repeat themselves during the year. Cycle components consists on short-term variations but that are not strictly periodical. These forecast evolutions are obtained through historical series, being sums of a variable past observations in regular periods of time (Jimenez and Gimenez, 2000). Using historical series about the product or competitors is especially important in buying intention analysis, since it brings a more globalised perspective. It represents the evolution process of the product being able to provide future forecasts (Kotler and Keller, 2012). Since this is an excellent instrument to measure demand, is the one that is selected to be used in this paper. Historical series allows marketers to know the acceptance level of products.

## 2. Demand forecast: estimation of the potential market of agrofood products

### 2.1 Objectives

This chapter focuses on estimating the potential market of Spanish agro-food products. As it was already explained, the prosperity phase Spain experienced before the 2008 crisis is analysed, as well as the recession period that followed it. For this, both data prior and after the economic crisis has been taken into account. Within this market, it is possible to identify different product categories. In this case, especial attention is taken to the market of fishery products, where Spain presents itself as the most important market in Europe.

Secondly, those different fish product categories that present higher growth rates will be identified and studied. More specifically, it is wanted to identify products with high growth potential and explain the causes that motivates this growth. The explication of the analysis will be both quantitative and qualitative. The main working hypothesis underlying this analysis is that, when developing fishery products, providing higher added value to consumers tend to allow the market to accept and claim those products, even in stagnation market situations.

### 2.2 Forecast market potential of agro-food and sea-food products.

As it was explained in the first chapter, analysing the market potential is really important when investigating the forecast demand of a market. In the case of food products, the overall evolution during the last fifteen years is presented below, in terms of inside and

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outside quantity (millions of Kg.) and value (millions of €). This corresponds to table 2.1 and figure 2.1.

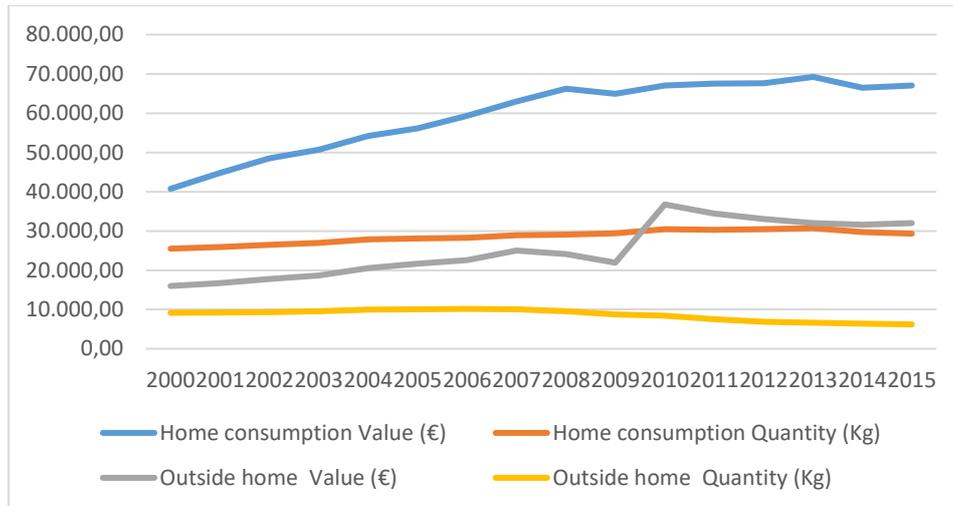
This following data will demonstrate, on a qualitative way, the existence of a structural change in the behaviour of inside Spanish food consumption. Households are spending less income per capita in absolute terms for household consumption, in which only products with greater added value will be able to overcome this stagnation.

**Table 2.1 Food consumption evolution in quantity and value. Period 2000-2015.**

Year	Inside home		Outside Home		Kgs/per capita	€/per capita
	Quantity (millions Kg.)	Value (millions €)	Quantity (Kg.)	Value (€)		
2000	25,489.71	40,740	9,117.93	15,980	862.9	1,414.05
2001	25,908.78	44,740	9,218.63	16,700	871.4	1,524.14
2002	26,464.40	48,510	9,317.02	17,730	882	1,632.87
2003	26,947.77	50,720	9,571.47	18,690	891.07	1,693.49
2004	27,842.84	54,230	9,942.52	20,520	894.8	1,770.22
2005	28,100.35	56,175	10,004.21	21,635.23	890.48	1,818
2006	28,219.07	59,360	10,151.78	22,556	880.82	1,880
2007	28,943.04	62,992	10,000.00	25,023	640.00	1,892
2008	29,108.70	66,221	9,531.98	24,100.45	646.59	1,987
2009	29,391.60	64,911	8,704.95	21,940.52	642.70	1,419
2010	30,490.70	67,086	8,427.30	36,744.10	650.00	1,472
2011	30,282.30	67,520	7,500	34,471.60	659.90	1,471
2012	30,481.50	67,634	6,831	33,044	661.60	1,468
2013	30,717.10	69,225	6,658	32,024.70	676.40	1,524
2014	29,686.50	66,443	6,350	31,609	662.30	1,482
2015	29,295.90	67,043	6,200	31,994	656.70	1,503

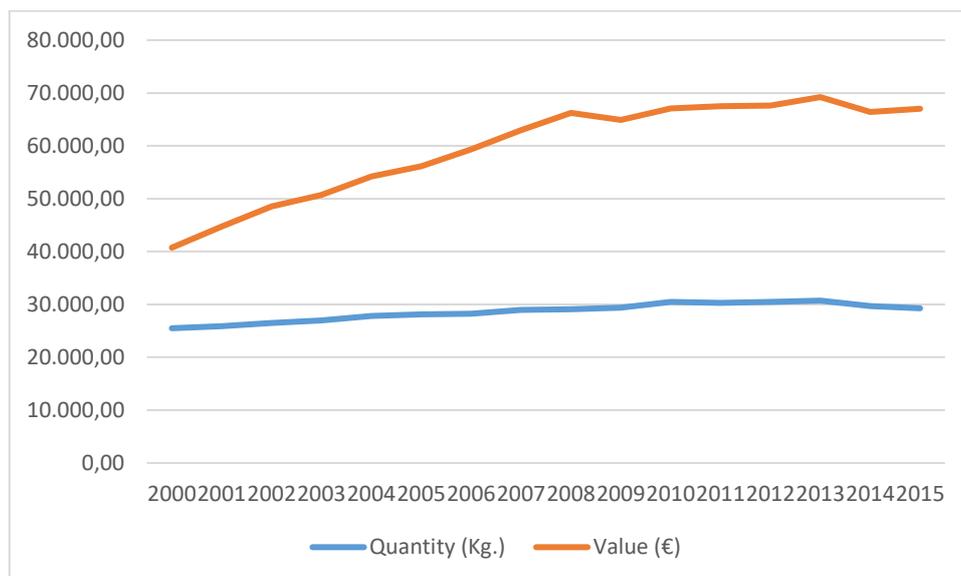
Source: Personal elaboration from Mapama (2000-2016) and Mercasa (2000-2016)

**Figure 2.1. Global Spanish food consumption in quantity (millions of Kg.) and value (millions of €).**

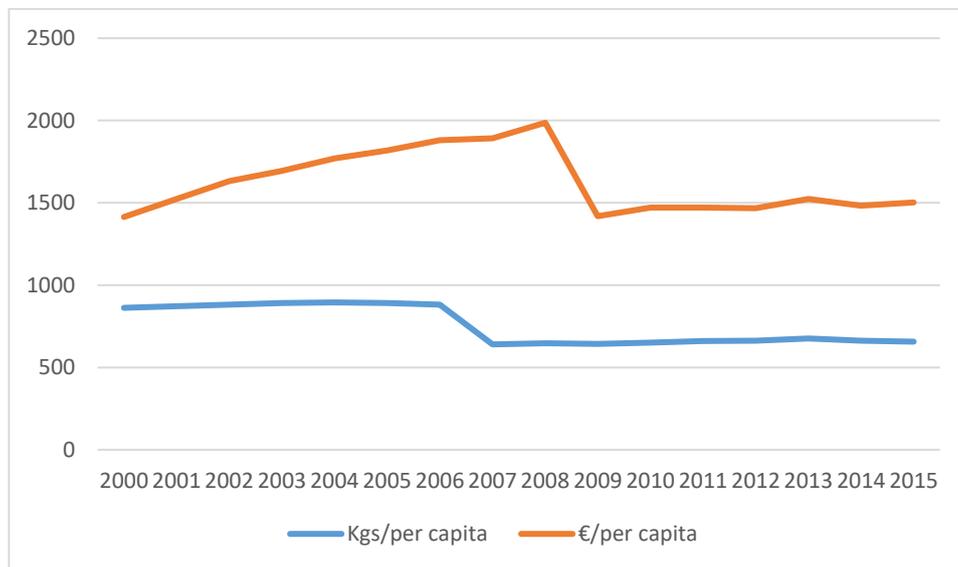


From the year 2000 to 2008, Spain is in a phase of prosperity, having a growing demand in both terms of quantity and value. However, this ceases with the beginning of the crisis of 2008 with a stagnation of food consumption and expenditure. It can be observed how market growth values are relatively low in comparison to the previous scenario. The growth presented in the period of economic recession is mainly due to the latent population of outside home consumption, formed in great part by tourism. As this does not reflect the actual behaviour of the Spanish population, the analysis will only focus on the household sector. These are presented in figures 2.2 and 2.3.

**Figure 2.2: Evolution of Spanish home consumption in quantity (millions of Kg.) and value (millions of €)**



**Figure 2.3 Evolution of Spanish home food consumption per capita (Kg. and €). Period 2000-2015.**



Although these two figures represent the evolution in terms of consumption and expenditure, it can be seen that at a per capita level the situation is more disadvantageous. At an aggregate level (figure 2.2) the demand in both terms of value (euros) and quantity (Kg.) continues to grow, with the difference that since 2008 growth is more moderated. Per capita expenditure in the year 2000 amounted to 1,414.05€ per person, whereas in 2015 it was 1.503€ spent per person. This shows how the growth difference is relatively null since it is 100€ more. The amount consumed (Kg.) per capita actually decreases from 862.9Kg per capita in 2000 to 656.7Kg per capita in 2015. This means that at a per capita level there is no growth capacity since the market is stagnant, characterising it then as a mature market.

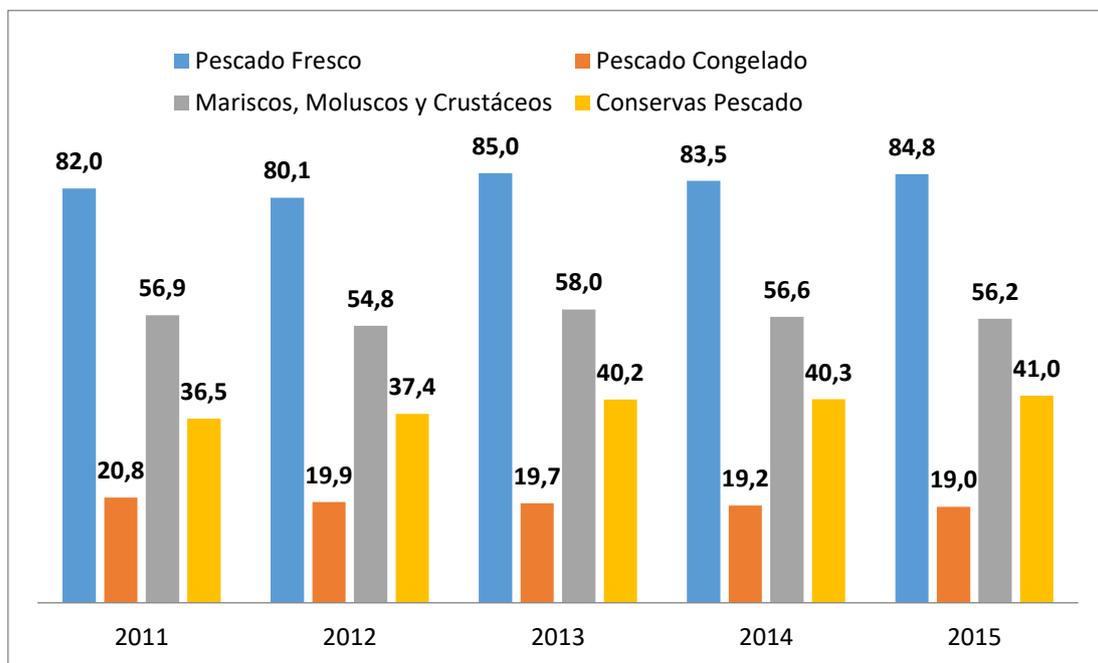
This difference shows how consumption and expenditure per capita are the most appropriate variables to analyse the research, since they provide information at a microeconomic level.

However, the next section will gather a study of most relevant fish product categories in order to have a deeper analysis of this demand. What it would be concluded is the fact that, even in a mature markets, despite the fact that there is no change in terms of quantity, consumers are able to spend more money (value) on products that have an added value.

## 2.3 Market potential of fishery products. Analysis by categories.

Spain is the most important market for fishery products in Europe. In 2015, according to the Ministry of Agriculture, Fisheries, Food and Environment (Mapama, 2017), Spanish households consumed 1.155,2 million kg. of fishery products, with an economic value of around 9 million euros. In per capita terms, consumption and expenditure reached 26kg. and 200€, both per person at a household level. The highest consumption is associated with fresh fish (45.2% of total consumption), followed by canned fish and fresh mollusc (17,4% of total consumption) and fresh seafood (13.4% of total consumption). Frozen seafood, mollusc and crustaceans account for only 11.2% of total consumption. Figure 2.4 represents this data.

**Figure 2.4. Consumption evolution of the different fish type products**



Source: personal elaboration from MAPAMA (2016) data.

### a) Fresh fish

This is the highest consumption and expenditure category during the whole time series. As it can be seen in table 2.2 and figure 2.5, in terms of value the demand grows until it reaches its maximum in 2006 with 4,524.22 million euros. However, this evolution changes from 2,606.8M € in 2000 to 3,786.2M € in 2015, and as it can be seen the

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difference is minimal. In terms of consumption (millions kg.), the increase is imperceptible, going from 472M Kg. in 2000 to 519M Kg. in 2015.

The same result occurs at a per capita level. Consequently, per capita demand in euros, shown in figure 2.6, changes from 82.5€ per person in 2000 to 85.8€ per person in 2015, in which as it can be seen there is basically no difference. Consumption per capita decreases at a moderate level, from 14.87Kg per person to 11.54Kg. per person in 2000 and 2015, consequently.

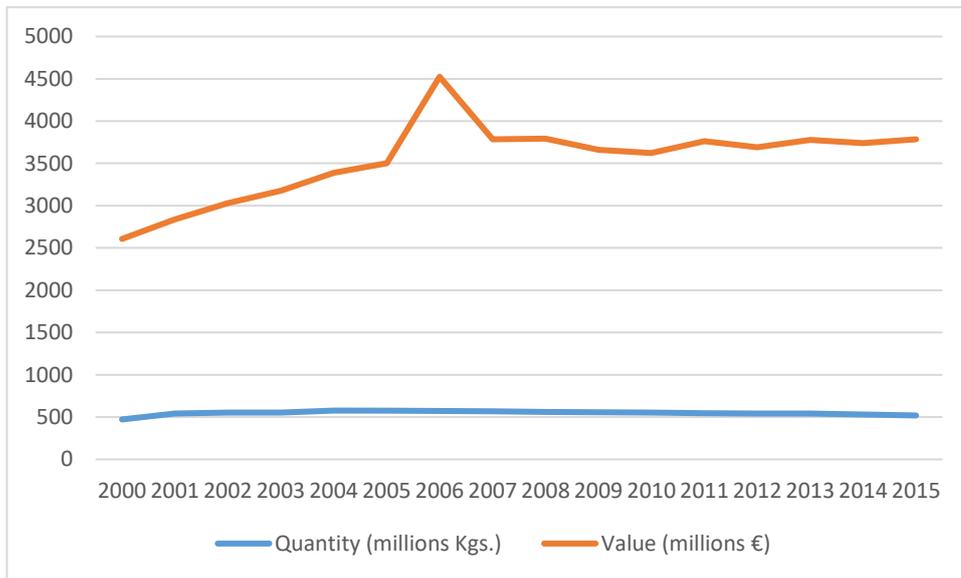
Therefore and using Kotler's market concept (Kotler, 2012), it is observed how food household consumption and expenditure are in a stagnation phase of a mature market, without possibility of growth.

**Table 2.2 Evolution of quantity (Kg.) and value (€) of fresh fish. Period 2000-2015.**

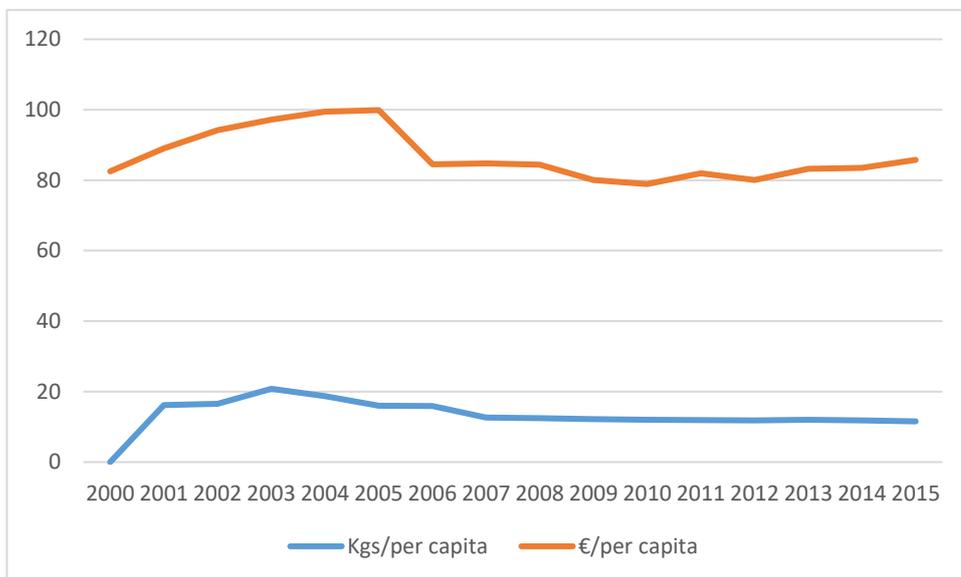
<b>Year</b>	<b>Quantity (millions Kgs.)</b>	<b>Value (millions €)</b>	<b>Kgs/per capita</b>	<b>€/per capita</b>
<b>2000</b>	472,04	2.606,83	14,8 7	82,47
<b>2001</b>	541,35	2.835,90	16,2	89,06
<b>2002</b>	551,41	3.031,46	16,5	94,18
<b>2003</b>	553,65	3.177,31	20,8	97,19
<b>2004</b>	576,88	3.387,51	18,69	99,42
<b>2005</b>	575,22	3.501,26	15,98	99,89
<b>2006</b>	571,45	4.524,22	15,88	84,47
<b>2007</b>	566,49	3.784,43	12,69	84,8
<b>2008</b>	561,84	3.794,31	12,49	84,37
<b>2009</b>	558,52	3.660,84	12,21	80,05
<b>2010</b>	553,56	3.624,38	12,05	78,9
<b>2011</b>	544,5	3.761,40	11,9	82
<b>2012</b>	540,9	3.691,50	11,8	80,1
<b>2013</b>	543,1	3.776,40	12	83,2
<b>2014</b>	528,8	3.741,30	11,8	83,5
<b>2015</b>	519	3.786,20	11,54	85,81

Source: Personal elaboration from Mapama (2000-2016) and Mercasa (2000-2016)

**Figure 2.5. Evolution of Spanish home consumption in quantity (millions Kg.) and value (millions of €) of fresh fish. Period 2000-2015.**



**Figure 2.6. Evolution of Spanish home per capita (Kg. and €) consumption of fresh fish. Period 2000-2015.**



## b) Frozen fish

Frozen fish are found, as shown in table 2.3 and figures 2.7 and 2.8, in the same stagnation phase as fresh fish. In fifteen years consumption evolution has not even doubled, from 109.83M kg in 2000 to 125.9M kg in 2015. In terms of value the increase is hardly susceptible, changing from 590.5M euros in 2000 to 847.7 million euros spent in 2015. This results confirms the stagnation situation of the market.

The per capita expenditure in 2000 is the same as in 2015; 19€ per person. In terms of consumption there is even a decrease in the values, changing from 3.8Kg per person in 2000 to 2.73Kg. per person.

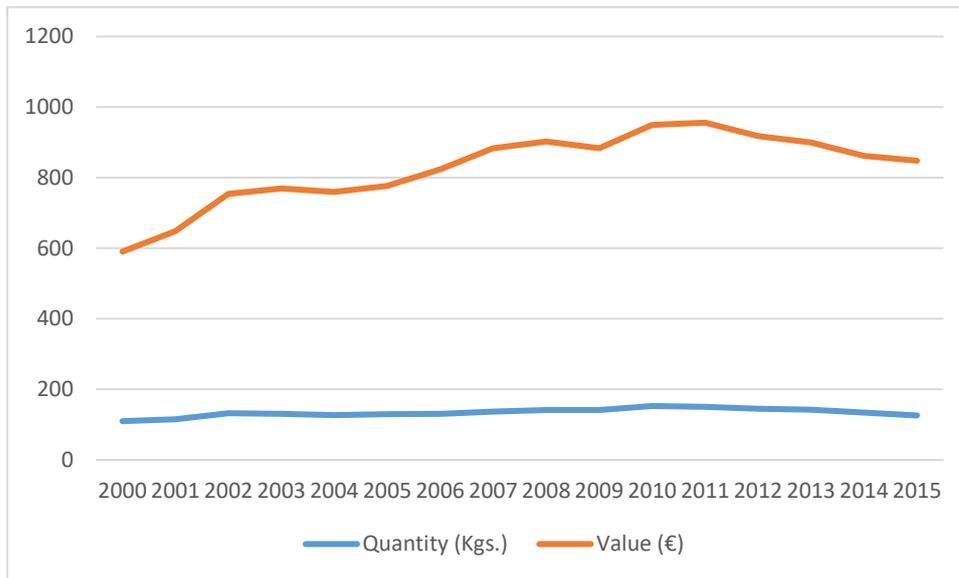
Once again the stagnation of the market is easily identified in the household Spanish home market, specifically in the field of fisheries, where the pre-crisis values are never able to be reached again due to the market retraction.

**Table 2.3. Evolution of quantity (Kg.) and value (€) of frozen fish. Period 2000-2015**

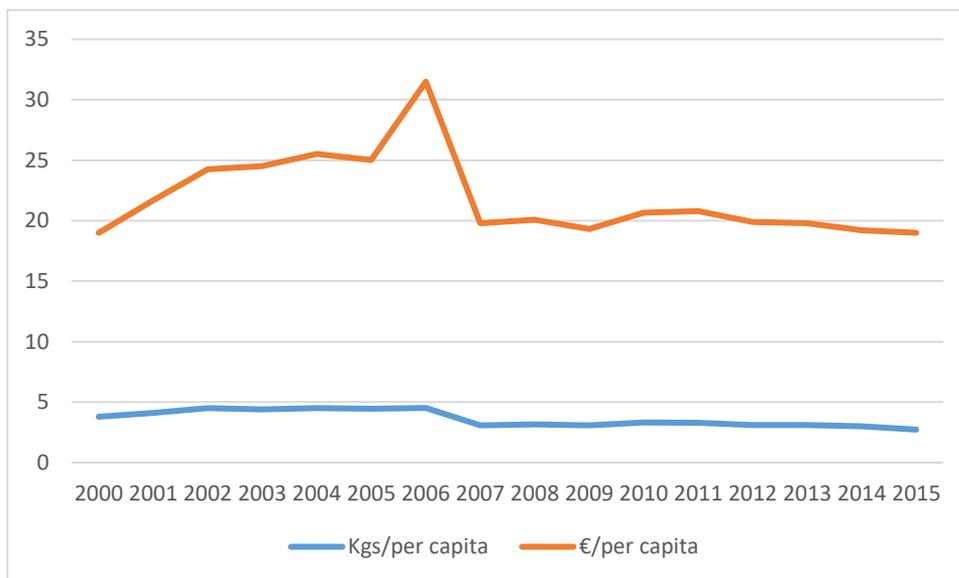
<b>Year</b>	<b>Quantity (millions Kgs.)</b>	<b>Value (millions €)</b>	<b>Kgs/capita</b>	<b>€/capita</b>
<b>2000</b>	109,83	590,44	3,8	19,01
<b>2001</b>	114,9	648,52	4,1	21,69
<b>2002</b>	132,24	753,83	4,5	24,25
<b>2003</b>	130,85	769,82	4,4	24,52
<b>2004</b>	126,57	759,55	4,5	25,52
<b>2005</b>	129,52	776,75	4,45	25,02
<b>2006</b>	130,54	823,28	4,52	31,49
<b>2007</b>	136,82	883,13	3,07	19,79
<b>2008</b>	141,71	902,54	3,15	20,07
<b>2009</b>	140,96	883,51	3,08	19,32
<b>2010</b>	152,77	949,39	3,33	20,67
<b>2011</b>	150,3	955,86	3,3	20,8
<b>2012</b>	144,7	917,8	3,1	19,9
<b>2013</b>	142,3	899,8	3,1	19,8
<b>2014</b>	134,3	861,5	3	19,2
<b>2015</b>	125,9	847,7	2,73	19

Source: Personal elaboration from Mapama (2000-2016) and Mercasa (2000-2016)

**Figure 2.7. Evolution of Spanish home consumption in quantity (millions Kg.) and € (millions €) of frozen fish. Period 2000-2015.**



**Figure 2.8. Evolution of Spanish home per capita (Kg. and €) consumption of frozen fish. Period 2000-2015.**



### **c) Canned fish**

Unlike the two previous categories, canned fish are products with higher added value as they mainly add convenience benefits. Thus, the convenience preference decreases time preparation, which are temporary costs, favouring the benefit/cost ratio and therefore, adding value to the product.

For this reason, as it can be seen in table 2.6 and figure 2.7, this is the only product out of the three categories whose demand grows in terms of value. As a result, it growth from 884,92M euros in the year 2000 to 1,827M euros in 2015. This meant an increase –non deflated- of more than double, situation that is not seen in the other categories. Meanwhile, the increment in quantity was much lower, changing from 146.2M Kg. to 200M Kg. This data allows us to verify that it is a mature market, having a moderate growth in terms of quantity but for which consumers are willing to pay an overcharge due to the perceived added value.

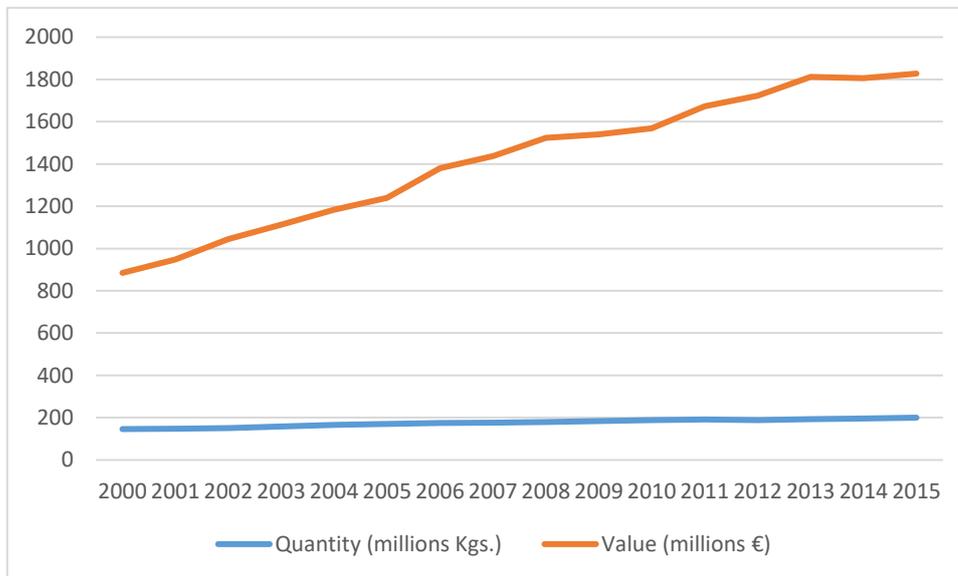
This same analysis can be observed for household per capita consumption values. In terms per capita, the amount in value evolves from 26€ per capita in the year 2000 to 40€ per capita in 2015, showing a very remarkable growth. Similarly, the increase on quantity purchased has been lower. With this, the same conclusion can be reached as with aggregate levels; although Spanish per capita income has declined as a consequence of the crisis, Spanish households are willing to pay more for the same product as long as it provides then an added value.

**Table 2.4 Evolution of quantity (Kg.) and value (€) of canned fish (period 2000-2015)**

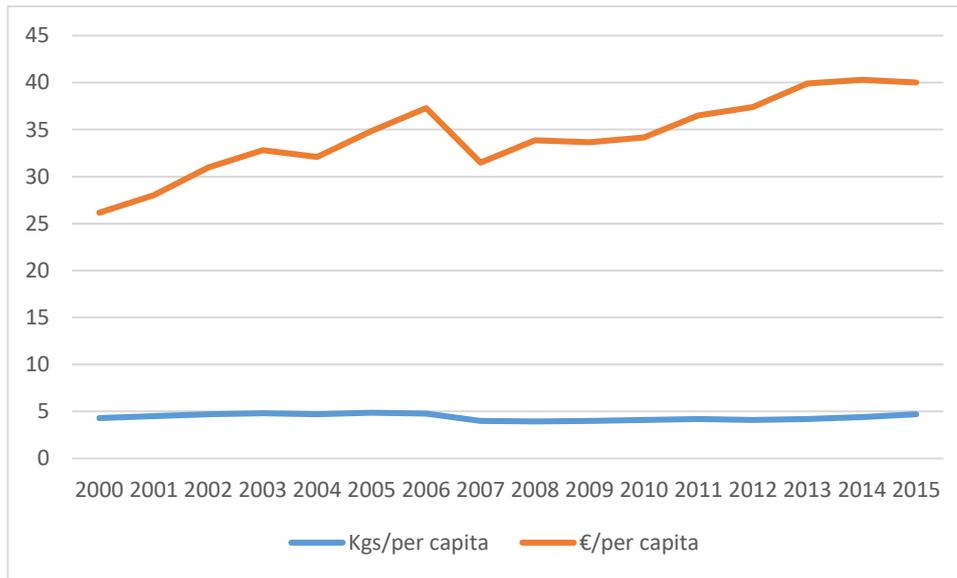
Year	Quantity (millions Kgs.)	Value (millions €)	Kgs/capita	€/capita
2000	146,02	884,92	4,30	26,16
2001	148,36	948,41	4,50	28,01
2002	150,68	1.044,57	4,70	30,96
2003	157,65	1.112,25	4,80	32,82
2004	165,97	1.183,71	4,70	32,09
2005	170,21	1.239,19	4,87	34,85
2006	175,18	1.379,67	4,77	37,30
2007	176,1	1.437,76	4,00	31,49
2008	180	1.523,50	3,94	33,87
2009	183,36	1.540,01	4,01	33,67
2010	188,6	1.569,02	4,11	34,16
2011	191,9	1.672,80	4,20	36,50
2012	189	1.722,30	4,10	37,40
2013	192,7	1.811,60	4,20	39,90
2014	196	1.805,40	4,40	40,30
2015	200	1.827,50	4,70	40,00

Source: Personal elaboration from Mapama (2000-2016) and Mercasa (2000-2016)

**Figure 2.9. Evolution of Spanish home consumption in quantity (millions Kg.) and value (millions €) of canned fish. Period 2000-2015.**



**Figure 2.10. Evolution of Spanish home per capita (Kg. and €) consumption of canned food. Period 2000-2015.**



## 2.4 Preferences towards seafood products: Literature review

The following table gathers the main contributions in agro-food research, paying special attention to fishery products. As it is shown in table 2.7, convenience associated with time reduction when preparing or processing fishery products is the most important preference component when evaluating consumption purchasing results. Equally important is the sensorial quality in which taste is the most relevant attribute. Finally, health is another reason that strongly influences the demand for fishery products, especially for older or elderly consumers. As for young people, despite knowing that it is a healthy product they do not tend to claim it for this associated benefits but for saving time in its preparation. In the same way, young people reject fish products due to their bad smell, fish bones, appearance and its preparation costs. Taking into account the fundamentals explained in chapter one, these would refer to the perception of psychological costs. These costs can easily make consumers reject the consumption of this product.

In conclusion, the development of a greater degree of convenience and good sensory properties (mainly texture and flavor) would allow to offer fish products of greater value to the final consumer.

**Table 2.5 Synthesis of the most relevant contributions of consumer preferences towards fishery products.**

<b>Author</b>	<b>Indicators</b>	<b>Product</b>	<b>Results</b>
Harrison et al. 1998	Price, shape, taste	Fish products	Taste, price and shape importance.
Acebrón and Dopico, 1999	Attribute investigation	Fish products (mussels)	Health, short-time preparation and acceptance
Acebrón and Dopico, 2000	Intrinsic and extrinsic attributes	Fresh meat	Negative associations with colour, freshness and fat in the purchasing moment since it adds perceived price.
Leek et al. 2000	Acceptance and rejection of products	Fish products	Acceptance on taste and convenience when consumption.  Rejection on smell, appearance, cooking/preparation and fish bones.
Myrland et al., 2000	Acceptance and rejection of products	Fish products	. Acceptance on taste and convenience when consumption.  Rejection on smell, appearance, cooking/preparation and fish bones.
Honkanen et al. 2003	Acceptance and rejection of products	Fish products	Acceptance: taste, convenience  Rejection: smell, appearance, fish bones
Olsen, 2003	Acceptance and rejection of products	Fish products	Acceptance: convenience and health.  Rejection: inconvenience and availability.
Sveinsdóttir, 2006	Young acceptance and rejection of products	Fish products	Young acceptance: convenience  Young rejection: inconvenience in time preparation

Source: Personal Elaboration

## 2.5. Structural change hypothesis and statistical analysis.

Once it is demonstrated the importance of high value added products with the case of canned fish, it is relevant to emphasize the fact that this growth is happening in a mature market. This means that high value added products are able to provide a higher growth in terms of per capita values (€), but also overcome the stagnation phase of the market.

This section will quantitatively demonstrate the existence of a structural change in the Spanish food market after the crisis of 2008. The identification of this tendency change on time series will be demonstrated through the Chow Test.

The Chow test is a contrast based on the F statistic, been carried out to detect possible structural changes in time series. It consists on the estimation of a regression model in which the squared residual sum (SRC) is calculated. Next, two new regressions of the first sample are calculated, one before the supposed structural change while the other one after that supposed change. The sum of residues squared is calculated in each sub-regression, obtaining  $RSC_1$  and  $RSC_2$ . The contrast provides a test for the null hypothesis of no structural break at the given point, in which the hypothesis test is applied and contrasted with the F statistic below. If the calculated statistic is greater than the F statistic, the null hypothesis would be rejected, accepting then the presence of a structural change. If it would be smaller, the null hypothesis could not be rejected, and therefore there would be no structural change (Navarrete, 2011 and Uriel and Peiro, 2000).

As a result, with this data:

$$\text{Regression model: } Y_t = \beta_0 + u_t$$

$$\text{Sub-regression model 1: } Y_t = \beta_1 + u_{1t}$$

$$\text{Sub-regression model 2: } Y_t = \beta_2 + u_{2t}$$

With the hypothesis:

$$H_0: \beta_0 = \beta_1 = \beta_2 - \text{No presence of structural change.}$$

$$H_1: \beta_0 \neq \beta_1 \neq \beta_2 - \text{Presence of structural change.}$$

$$F \text{ statistic: } F = \frac{\frac{SCR - (SRC_1 + SRC_2)}{K}}{\frac{SCR + SCR_2}{n - 2K}} \sim F_\alpha (K, n - 2K)$$

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Being “ $y$ ” the dependant variable of per capita consumption, “ $\beta$ ” the intercept while “ $u$ ” are error perturbations. “ $K$ ” the number of parameters of the model, and “ $n-2K$ ” the degrees of freedom, being “ $n$ ” the size of the sample.

In the Chow test, the trend change date must be known a priori. For this reason, in this project several tests had been analysed with different periods from the vicinity of the year that is usually consider as the outbreak of the crisis, in 2008. Likewise, the information obtained from the graphs –figure 2.3, 2.6, 2.8, 2.10 and 3.1– is used to identify the year of the structural change. The results obtained are gathered in table 2.5, in which the years are the observations in the contrast of structural change. The last fish product category, Gula del Norte, will be explained in the next chapter but the structural change analysis was needed in order to study the case.

**Table 2.6 Results of the Chow Test analysis.**

	<b>Contrast Statistic</b>	<b>p - value</b>	<b>Result</b>
<b>Aggregate level</b>			
2007	$F(1, 14) = 1.00875$	0.3322	The null hypothesis is rejected and therefore there is a structural change
2008	$F(1, 14) = 3.36432$	0.0879	
2009	$F(1, 14) = 12.9092$	<b>0.0029</b>	
2010	$F(1, 14) = 6.66388$	0.0217	
<b>Fresh fish</b>			
2005	$F(1, 14) = 6.41002$	0.0239	The null hypothesis is rejected and therefore there is a structural change
2006	$F(1, 14) = 22.5564$	<b>0.0003</b>	
2007	$F(1, 14) = 15.289$	0.0015	
2008	$F(1, 14) = 11.9885$	0.0038	
<b>Frozen fish</b>			
2006	$F(1, 14) = 1.8228$	0.1984	The null hypothesis is rejected and therefore there is a structural change
2007	$F(1, 14) = 13.1138$	<b>0.0027</b>	
2008	$F(1, 14) = 8.36163$	0.0118	
2009	$F(1, 14) = 6.00289$	0.0280	
2010	$F(1, 14) = 3.79941$	0.0715	
2011	$F(1, 14) = 3.24087$	0.0934	
<b>Canned fish</b>			
2007	$F(1, 14) = 6.85573$	0.0202	The null hypothesis is rejected and therefore there is a structural change
2008	$F(1, 14) = 10.6878$	0.0055	
2009	$F(1, 14) = 11.9137$	0.0038	
2010	$F(1, 14) = 14.7685$	<b>0.0017</b>	
<b>Gula del Norte</b>			
1990	$F(1, 37) = 7.3503$	0.0101	The null hypothesis is rejected and therefore there is a structural change
1991	$F(1, 37) = 10.4228$	<b>0.0026</b>	
1992	$F(1, 37) = 14.4897$	0.0005	
1993	$F(1, 37) = 19.3736$	8.7991	

Source: personal elaboration from the software programme Gretl.

In all cases the null hypothesis is rejected. As a result, the existence of a structural change in Spanish households' consumption is demonstrated, since at least in one of the years selected as a possible change the p-value found is below 5% (usual value taken as reference for the acceptance or rejection of the null hypothesis). In addition, as it is seen in the tables, the p-values obtained are quite low; this fact demonstrates an even stronger evidence against the null hypothesis.

The yellow shading shows the specific year in which the structural change is expected, according to data in tables 2.1, 2.2, 2.3, 2.4 and 3.1, as well as the corresponding graphs of the section. As it can be seen, in most cases these p-values are the lowest ones of all tested years, supporting the evidence of the existence of breaking points in the series under the study.

## 2.6 Objective estimation of the potential market for food and fishery products in terms of household consumption.

At an aggregate level, per capita expenditure (figure 2.3) continues to grow achieving its maximum potential in 2008; 2,987€ per person. After the crisis expenditure decreases abruptly, being in 2009 1,419€ per capita, which is practically the same at the minimum potential of the whole series; 1,414€ per capita in 2000. The same situation happens in terms of consumption, obtaining the maximum potential in the prosperity situation, 894.8Kg per capita in 2004, as well as the minimum potential with the outbreak of the crisis, 640Kg per capita in 2007. This market demand behaviour –characterized by a prosperity scenario followed by an economic recession–, is the same as the one explained in the first chapter.

The maximum potential of fresh fish (figure 2.5) was reached in 2005 with 99.89€ per capita. Just like the expenditure, the maximum potential in terms of consumption is also reached in the prosperity stage; 20.8Kg per capita in 2003. The minimum potential is observed in the recession of the economic period; 78.9€ per capita in 2010 and 11.9Kg per capita in 2011. Once again, the same characteristic market demand behaviour from chapter 1 is obtained, in which home food market never recovers.

The same situation is found in frozen fish (figure 2.8). Thus, the maximum potential is reached in 2006; 31.49€ per capita and 4.52Kg per capita. Its minimums, however, in 2015; 19€ per capita and 2.73Kg per capita.

Canned fish, however, overcomes this stagnation phase in terms of expenditure due to the product added value. The minimum potential is, unlike the previous cases, in the prosperity period; 26.16€ per capita in 2000. The maximum potential of the prosperity phase is reached in 2006 with 37.3€ per capita and 4.87Kg per capita in 2005. Since the product has a high added value, the crisis period is only reflected for one year, in 2007, with 31.49€ and 4Kg. per capita. Thus, after 2007 there is another prosperity situation in which values continue to grow, reaching a second maximum potential of 40.3€ per capita

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in 2014. As it can be seen, this value is capable to overcome the previous maximum potential of 2006, even with a structural change pattern. In terms of consumption, it is reached in 2010 with 4.11Kg per capita.

**Table 2.7. Objective estimation of the potential market for food and fishery products in terms of household consumption and synthesis of the structural change analysis of time series.**

Potential market: Food		Potential market: Fresh fish		Potential market: Frozen fish		Potential market: Canned fish	
Prosperity scenario (per capita consumption)	Crisis scenario (per capita consumption)	Prosperity scenario (per capita consumption)	Crisis scenario (per capita consumption)	Prosperity scenario (per capita consumption)	Crisis scenario (per capita consumption)	Prosperity scenario (per capita consumption)	Crisis scenario (per capita consumption)
2,987€ (Year 2008)	1,524€ (Year 2013)	99.89€ (Year 2005)	85.81€ (Year 2015)	31.49€ (Year 2006)	20.8€ (Year 2011)	37.3€ (Year 2006) 40.3 € (Year 2014)	31.49€ (Year 2007)
894.8Kg (Year 2004)	676.4Kg (Year 2013)	20.8Kg (Year 2003)	12.49Kg (Year 2008)	4.52Kg (Year 2010)	3.33Kg (Year 2010)	4,87Kg (Year 2005) 4,7 Kg. (Year 2015)	4Kg (Year 2008)
Chow's Test  Structural change in the time series which causes a consumption behaviour change.  Turning point: year 2009		Chow's Test  Structural change in the time series which causes a consumption behaviour change.  Turning point: year 2006		Chow's Test  Structural change in the time series which causes a consumption behaviour change.  Turning point: year 2007		Chow's Test  Structural change in the time series which causes a consumption behaviour change. Fall down turning point: Year 2006 Recovery turning point: year 2007	

## 3. Development of a high added value fish product: the eel.

### 3.1 Introduction

The Spanish company Angulas Aguinaga S.A was created in the year 1974. The company was formed due to the merger of several traditional fishing companies with experience in the commercialization of elvers. However, the own overexploitation of the product, mostly motivated by the high prices that reached the market –up to 400€/Kg–, forced the firm to innovate itself and ended up becoming one of the biggest surimi merchants of this product in Spain. This happened in the eighties due to the limitation of resources, in which the overexploitation of elvers caused a shortage of the product by diminishing its sales volume; which ended up reaching only the 10% of the usual sales. As a result, fishing industry enterprises must adapt themselves with innovation, not just by developing new fishing products but by taking advantage at the existing raw material. In other words, adding value to current resources (Angulas Aguinaga, 2017).

Due to this environmental conditions and a strong innovative character, Angulas Aguinaga decided to give up the commercialization of elvers and manages to create a natural elver substitute made of surimi; “La Gula del Norte”. With this, they created a new business idea really successful in Spain. The launch of the product was supported by a strong marketing campaign, situating the product in the lead of its category. As a result, Angulas Aguinaga became the national leader in the production and sale of refrigerated fishery products from fish raw materials; achieving 20% of the total surimi sales volume in Spain (Fish, 2017). Furthermore, they achieved the 80% of the total refrigerated eel

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market and the 70% of crab sticks in Spain. In the year 2014, Angulas Aguinaga increases its income by 12.8% in relation to the previous year, reaching up to 95 million euros (Alimarket, 2015).

### 3.2 Angulas Aguinaga: Evolution of captures and production of elvers (period 1977-2015)

The European elvers decline in all its distribution areas started in the middle sixties (Moriarty, 1990, 1996; Lobón-Cerviá, 1999; Nielsen and Prouzet, 2008), due to several causes such as overfishing, destruction and alteration of natural habitats. For Angulas Aguinaga, this declined occurred until 1991, year that reached its minimum captures by 95,987 Kg. In 1997, the International Council for the Exportation of the Sea (ICES) warns about this situation, explaining the need to reproduce captive eels to provide an adequate and consistent supply at an European level. Other enterprises were concern about this situation, such as the Ministry of Agriculture, Fishery and Food. They elaborated a report showing the main eel commercialization problems and developments, explaining the needs of big investigation and innovation plans for the development of the product.

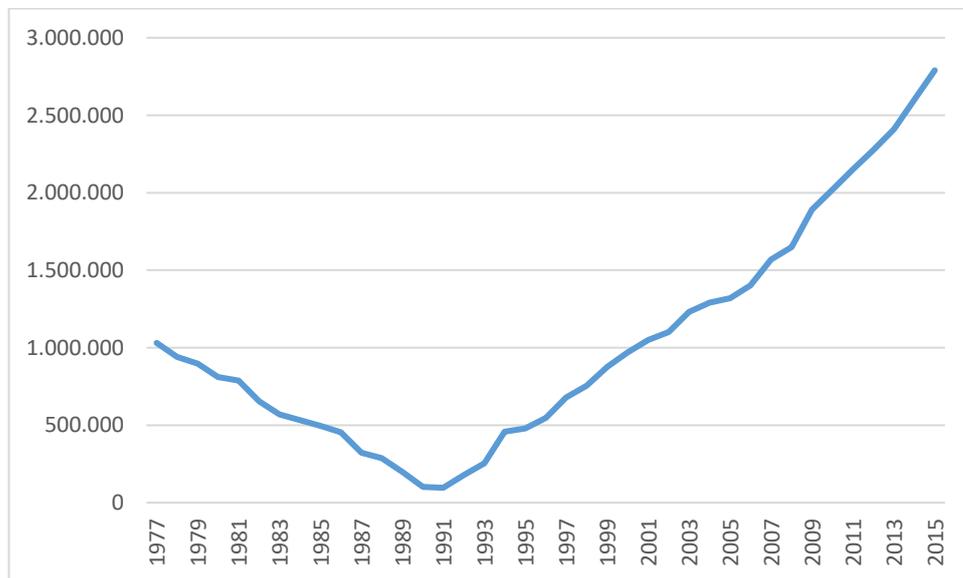
As it can be seeing in figure 3.1, Angulas Aguinaga experimented a big decline in elvers captures from the year 1977 until 1991 (Angulas Aguinaga, 2017). This situation was very similar in the rest of fishing European companies, which are characterized for a strong eel captures decline and an increment in its aquaculture production. In the year 1991, Angulas Aguinaga decides to develop new strategic decisions.

**Table 3.1 Angulas Aguinaga evolution of captures and production of elvers.  
1977-2015**

Year	Captures (kg.)	Year	Captures/ Production (kg.)	Year	Production (kg.)
1977	1.030.053	1990	102.000	2003	1.230.000
1978	940.054	1991	95.987	2004	1.290.000
1979	897.098	1992	178.000	2005	1.320.000
1980	810.876	1993	254.000	2006	1.401.200
1981	786.943	1994	459.000	2007	1.568.000
1982	654.720	1995	478.000	2008	1.650.000
1983	569.800	1996	546.800	2009	1.890.000
1984	532.100	1997	679.000	2010	2.020.000
1985	495.800	1998	754.000	2011	2.150.000
1986	453.200	1999	876.000	2012	2.276.000
1987	321.896	2000	970.000	2013	2.409.000
1988	287.964	2001	1.049.000	2014	2.598.000
1989	198.765	2002	1.100.000	2015	2.789.990

Source: personal elaboration from the firms' own data

**Figure 3.1 Angulas Aguinaga Evolution of captures and production of elvers (Kg.)**



Source: personal elaboration from the firms' own data

“La Gula del Norte” is an elver imitation achieved with surimi. Surimi is formed by white fish, these species are high in abundance but have low commercial outlet with a low price. The product is obtained from the fish muscle, usually fabricated with pollock but it can be also obtained from other species.

As a result, Angulas Aguinaga solved the big elver commercialization problem with the obtaining of a natural substitute, creating “La Gula del Norte”. However, besides being a big alternative from elvers due to the overexploitation at a business level, elvers imitation provide great added value to its consumers. The convenience preference is one of the main added value benefits it provides, however this added value study is presented bellow in the following section.

### 3.3 Analysis of value proposal of imitation elvers

According to Kotler and Keller (2012), every business objective is based on bringing value to its consumers with a benefit. What is actually important for firms is to generate an added perceived value to its clients, in which total perceived benefits need to be higher than its total perceived costs among alternative offers.

The concept of value and the elements that formed it were explained in the first chapter. Following that structure from chapter 1, an analysis of the different added value product categories will be analysed in the following. Due to the existence of different value sources and the priority each one has, especial attention will be taken in the sensory or organoleptic quality, as well as nutritional quality and psycho-functional benefits. Image, services and other benefits will be explained as well although in a less level of detail. Furthermore, the main dimensions that had just being mentioned will be commented with real products in order to do a qualitative study of “La Gula del Norte”, being then able to acquire a higher knowledge in the process of adding value.

#### **A) Perceived benefits**

##### ***a1) Product perceived benefits from the perceived quality: Sensory and organoleptic value.***

As it was explained in the first chapter, Grunert et al. (1995) differentiate two important moments, which are the buying process and the consumption process. This is why the perceived quality that is given in the buying process is especially important at the beginning of the process. In this moment, the physical appearance of the product is the most outstanding perception consumers tend to have. This are sensory properties being the texture and colour of the product the main important

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ones (Grunert, 2005). La Gula del Norte simulates elvers' physical appearance (size, shape and colour) as well as the texture, allowing this to be one of the most expensive products in the market.

On the other hand, in the act of consumption the smell and taste are the attributes that have a higher impact on consumers (Grunert et al., 1995). As it was explained in the literature, taste it is the attribute that brings the more satisfaction to consumers, which is why at the time of developing a product this is extremely important. This is exactly what Angulas Aguinaga has done. The firm has focused on developing successful taste and texture, in which all surimi is formed with Alaska Pollock, being considered the best fish specie for this procedure. This is due to the high purity of the sea as well as the nutritional characteristics it presents.

***a2) Product perceived benefits from nutritional quality: nutritional value***

As it was explained before, "La Gula del Norte" is elaborated with the most nutritional parts of white fish (Borderías y Tejada, 1987). This allows the raw material to preserve most of the nutritional qualities of the fish, making a high quality imitation elver product.

***a3) Product perceived benefits from psycho-functional quality (saving preparation)***

This product adds value by saving time preparation, however it has other benefits as well such as the ease of its use or preparation and even consumption. According to Steenkamp (1990), these are psycho-functional benefits, which are related with product packaging.

***a4) Brand and image perceived benefits***

Angulas Aguinaga has been able to develop a strong corporate brand. In fact, the product has the highest price in the market and yet still is the one most demanded due to its brand influence. Competition prices are the following;

**Table 3.2 Competitive imitation elvers' prices of Spanish companies**

Name of the company	Price per 100g
Angulas Aguinaga (La Gula del Norte)	2.50€/100g
Angulas de Manterola	1.55€/100g
Anguriñas (Pescanova)	1.20€/100g
Guiliciosas frescas (Basic-consumer)	1.22€/100g

Source: Personal elaboration from Revenga, 2013

As it can be seen, Angulas Aguinaga has a high superior price from the rest its competitors. This clearly justifies how the product really provides added value to its consumers, since it is the brand most chosen one from the market.

In relation with other benefits that require attention taking into account Angulas Aguinaga services to its consumers, the approaching effort of the brand and products through its website is quite relevant. The website allows all consumers to know the history of the company, as well as the production process and all range of products. Furthermore, in all of their range products they facilitate recipes, advice, coach nutrition and other services, which creates an entertaining, useful and friendly website.

## **B) Perceived costs: monetary and non-monetary costs**

Perceived costs were explained in chapter 1, in which when treating the theoretical subject they were separated in monetary and non-monetary costs. They both represent a costs or sacrifice to the consumer, which can be economical or of any other type (non-economical).

### ***b1) Monetary costs***

Angulas Aguinaga have high monetary perceived costs since they have the highest price in the market. This makes monetary costs especially important for the firm.

However, in this case costs are perceived as a sign of quality. This is the reason Angulas Aguinaga is able to maintain its leadership in the market in spite of its high prices, allowing them to keep up with no decline in its sales volume.

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***b2) Non-monetary costs***

These include physical, psycho-functional and temporal costs, which were explained in the section of psycho-functional benefits.

# Conclusions

The economic crisis has had negative effects on the different spheres of the economy, influencing on even those sectors of inelastic demand such as food products. This is why this final degree project has focused on the impact of the economic crisis in the fish products' market. In particular, the project has had two main objectives. Firstly, a market potential estimation of Spanish home fish products has being made, while at the same time it has being analyzed how the crisis affected home consumption behavior. Secondly, the opportunity of developing added value fish products has being investigated, focusing on the case study of elvers. In order to carry out this analysis, the information of home consumption data from the panel of the Ministry of Agriculture, Fisheries, Food and Environment has being used. All data is presented in terms of quantity (Kg. and Kg. per capita) and value (€ and € per capita), as well as the consumption and commercialization data from the enterprise chosen to be studied; Angulas Aguinaga (Kg.). Historical series and the Chow test are the tools that have being chosen in order to analyze all data evolution and the structural change in the time series.

This data analysis has allow to verify how home food consumption market has continuously increased until the year 2008. Moreover, several results had being identified.

Firstly and in global terms –non deflating series–, from the year 2008 onwards food market potential growth rate is quite moderated. However, when analyzing per capita consumption a structural change is observed on households residing in Spain. This is due to the diminishment of both per capita consumption (Kg. per capita) and value (€ per capita). This behavior is analyzed with the demand of different fish products categories; fresh, frozen and canned fish products.

Secondly, the fish category that presents higher growth rates are canned food products, in which consumers are willing to pay more for them in terms of value. This is prove that consumers are willing to pay more for higher added value products. In terms of food,

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added value products come from reductions in time preparation of the product as well as the impact the sensorial quality has on consumers (mainly good taste and appearance). This same result has being identified when analysing the elver market. The Spanish company Angulas Aguinaga has being able to recover the elver market, which was exhaust due to the overexploitation of the product, with the development of an innovative product. This is based on a fish substitute of high sensorial quality that also provides value by saving time in its preparation (easiness of preparation).

Thirdly, the development of a greater degree of convenience, motivated by time and effort saving in the elaboration and preparation of the product, as well as good sensory properties allows to offer higher value added fish products to the final consumer. A good example of this is the case study chosen; the development of new innovative products with an elver substitute; "Gula del Norte". This substitute has being obtained from raw material of white fish, developing a product with similar appearance and texture to the original. Furthermore, this fish products was developed providing consumers a higher degree of convenience. These are products that include facilities such as the ease of maintenance, preparation or use. An interesting application this has is when developing more functional and ergonomic packaging.

It has also been ascertain that marketing variables exert a great influence on the acceptance and commercialization of fishery products. As shown in the first chapter, an optimal selection of strategic and tactical variables –product, price, distribution and communication- greatly favours the acceptance and diffusion of new fishery products.

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